

NATURE AND THE ENVIRONMENT IN EARLY BUDDHISM



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Nature and the Environment in Early Buddhism
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Preface

In 2000 I spent a week in the forest around Jamui in Bihar. Although badly degraded in parts and unsafe in others because of bandits, the forest and its wildlife are still relatively intact. This short sojourn offered a rare glimpse of India's natural environment that would have been familiar to the Buddha but which has now almost completely disappeared. I saw nilghi, troops of languar, the quills of a porcupine, the glorious *Butea superba* in full bloom, a peacock and its mates and numerous other birds. At nearly every turn I was reminded of the Buddha's descriptions of the forest and of some of the bucolic poetry in the Jātaka. It was during these few pleasant days that I conceived the idea of writing something about nature and the environment as depicted in the Pāli Tipiṭaka.

I would like to thank Prof. P. D. Premasiri, Prof. K. R. Norman and Dr. Alexander Wynne, all of who helped me in various ways with this book. I must also thank Anandajoti Bhikkhu who read through several drafts of the book making numerous corrections and suggestions and bringing my attention to things I had missed. This book would probably not have seen the light of day without his help. Finally I must also express my gratitude to Dr. S. K. Jain, former Director of the Botanical Survey of India, who took a great interest in my research and offered me much encouragement.

Foreword

The first attempt to identify the plants in the Tipiṭaka was made by Robert Childers in his *A Dictionary of the Pali Language* of 1876. Childers gave about 165 plant names and provided the Linnaean nomenclature for most of these. However, more than half these names are from Pāli works composed in Sri Lanka and are not mentioned in the Tipiṭaka itself. Rhys Davids and Stede's *Pali English Dictionary* published between 1921-25, includes about 420 Pāli plant names with the botanical names for about a third of these. Included also are about 185 animal names of which only eight include the zoological names. It is unclear what authority Rhys Davids and Stede used for the nomenclature they did give but they seem to have relied heavily on Monier-William's *Sanskrit English Dictionary*.

In her translation of the Vinaya Piṭaka published between 1938 and 1966, I. B. Horner tried to identify the various medical plants mentioned in that work and in her subsequent 1975 translation of the Buddhavaṃsa, she identified the various trees associated with the 28 Buddhas and other plants. In this first translation, Horner seems for the most part to have followed Rhys Davids but where not she gave her reasons for preferring a different identification. In the Buddhavaṃsa she followed George Luce who in turn must have relied on the Burmese *sayadaws* whom, it would seem likely, were not familiar with plants endemic to northern India.

Studies in the flora and fauna in Sanskrit literature are very extensive, especially so in the case of flora because of the interest in ayurvedic medicine. As many Sanskrit names have Pāli equivalents such studies are relevant to the present book and I have consulted as much of this research as I have been able to. Modern Indian colloquial names for certain plants and animals likewise have proven helpful in making some identifications, although I have kept in mind Klaus Karttunen's comment that these are 'to be used with caution'.

A thorough compilation of material on flora, fauna and the environment from the Pāli Tipiṭaka is more than justified. Despite being a rich source of information on these subjects Indian scholars have

largely ignored Pāli literature. In their contributions to the magisterial *History of Science, Philosophy and Culture in Indian Civilization* series, Rajan and Sridhar use a wide range of religious and secular literature but have only three brief references to Pāli canonical or post-canonical works. Ghosh and Sen's study of botany in the post-Vedic period for *A Concise History of Science in India* utilize no Pāli material. Many other examples of this neglect could be given.

In trying to identify the flora and fauna in Pāli literature I chose not to rely on my predecessors so as to avoid perpetuating any mistakes they might have made, and only looked at their works after having finished my own. In some cases I found that I had come to the same conclusions as them although in other cases I had not. On many occasions I was unable to identify a plant or animal but found that Rhys Davids, Horner, etc. had done so, although I could find no justification for their conclusions. It should be pointed out however, that the identity of many plants and animals mentioned in ancient Indian literature is very conjectural. As G. J. Meulenbeld has shown, there is wide disagreement amongst scholars as to which Sanskrit plant name can be identified with which plant and this comment is equally valid for Pāli. I have no doubt made some mistakes. My hope is that in the future someone will be able to correct these mistakes and also fill in the many gaps I have left.

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Nature and the Environment as Depicted in the Pāli Tipiṭaka

There are 6400 species of fish in Jambudīpa, 4500 species of birds and 2400 species of beasts. There are 10000 species of trees, 8000 species of grass, 740 types of medicinal herbs and 43 types of aromatic plants.

Dvādaśaviharaṇa Sūtra *

The Buddha was born in and spent his whole life in what was then called the Middle Land, (*majjhima-desa*), the broad fertile plains surrounding the Ganges and Yamuna rivers. After his passing his teachings were committed to memory and later compiled into what is now known as the Pāli Tipiṭaka, the sacred scriptures of the Theravada school of Buddhism. The age of the Tipiṭaka is problematic but the core material in the Sutta Piṭaka probably dates from between the 5th and 3th centuries BCE. The exception to this are some of the books in the Khuddaka Nikāya, particularly the Jātaka. Most of the verses (*gāthā*) of the Jātaka, the only part considered canonical, are probably about the same age as the Vinaya Piṭaka (4th to 3rd centuries BCE). The prose stories (*atīta vatthu*) are somewhat later and the ‘introduction’ (*nidāna-kathā*), the ‘story of the present’ (*paccuppanna-vatthu*) and the ‘connection’ (*samodhāna*) are later still, although exactly how late is difficult to say. All these parts of the Jātaka will be used in this study. The Jātaka also reflect a knowledge of a wider geographical area than do the Sutta and Vinaya Piṭakas and include what is now lower Gharawal and Kumaon and the desert regions of Rajasthan.

While the bulk of the Tipiṭaka is concerned with the Buddha’s teachings, it nonetheless contains a great deal of incidental information about the social, economic, cultural and political life of the Buddha’s time.

* *Shi er you jing*, 《佛说十二游经》 Taisho edition of the Chinese Tripiṭaka, T4n195,p147. The name is a re-construction of the Sūtra’s original Sanskrit name.

It also tells us much about the natural environment of ancient northern India and how people were influenced by and related to it. Giving a broad overview of this environment the Buddha said that 'few in number are pleasant parks, forests, stretches of land and lakes, while more numerous are the steep rugged places, uncrossable rivers, dense thickets of scrub and thorns and inaccessible mountains' (A.I,35).

1. Climate and the Seasons

The seasons and the flora and fauna found in any area is determined to a large extent by the climate and the soil and the Tipiṭaka contains information about both. Northern India has three seasons - summer (*gimhāna*), the rainy season (*vassāna*) and winter (*hemanta*). During the summer (mid-March to mid-July), temperatures can get as high as 43 °C. The trees flower and loose their leaves while hot winds blow dirt and dust into the air (S.V,321). During the rainy season or monsoon (mid-July to mid-November) the temperature drops to about 20 °C and as much as 20 cm. of rain can fall. Every day, usually in the afternoon, one is sure to see 'a great rain cloud, thundering and pouring down refreshing rain everywhere, drenching the highlands and lowlands...' (It.66). Sometimes it would pour down for seven days straight (Ja.II,269; 445; III,73). As still happens today, rivers would break their banks, insects proliferate and the landscape would become green. During this time Buddhist monks and other ascetics would stay in one place because of the difficulty in travelling.

The importance of the monsoon for farmers and also plant and animal life was emphasized by the Buddha when he said: 'Rain sustains the life of all creatures on earth' (S.I,37), and: 'Abundant rain brings to perfection all crops for the good, the welfare and happiness of the many' (A.IV,244). If the monsoon failed, as it sometimes did, it would spell disaster for all life. The resulting drought would cause 'destitute people to wander here and there with their children in tow' and compel others to resort to banditry (Ja.II,367; VI,487). Crows would abandon the cities for the forest because people no longer fed them scraps, and fish and tortoises would bury themselves in the mud of their rapidly evaporating ponds in a desperate struggle to survive (Ja.I,331; II,149). Too much rain could also cause havoc. 'In hope farmers till their fields, their sons and wives coming to help. But rain destroys all their labour or lightning blights it' (Mv.II,59). The winter (mid-November to mid-January) is the most pleasant time of the year. Night temperatures can drop to as low as 5 °C and in the morning the grass and trees are covered with dew. The ancient Indians did not understand the process of evaporation and thought dew disappeared into the ground as the

sun rose (A.IV,137; Ja.IV,120). Occasionally winter nights get cold enough for frost to form (M.I,79).

Two minor seasons are occasionally mentioned as well; autumn (*sārada*), the month-long transition between the rainy season and the winter, and spring (*vasanta*), the transition between winter and summer. During the autumn ‘the air is clear, the sky cloudless and the sun breaking through the morning mist is hard to look at’ (D.II,183; Sn.687). This is also the time when the crops start to grow more robustly (M.I,116). In the *Nidānakathā*, Udāyī Thera described the beauty of the countryside at the beginning of spring like this: ‘The winter is ended, the spring has begun, people have gathered in the harvest and are taking it along the roads. The ground is covered with fresh green grass, the forest trees are in bloom and the roads are suitable for travelling’ (Ja.I,86). A character in the Therīgāthā says: ‘The sweet smell and the pollen of the flowers are spread in all directions by the towering trees. Indeed, early spring is a happy time’ (Thi.371).

The Tipiṭaka contains some observations about various meteorological phenomena related to the seasons and the weather. The Buddha identified different types of clouds which correspond in some ways to the modern cloud formation classification. The five types he mentioned are cool clouds (*sita*), warm clouds (*uṇha*), storm or thunder clouds (*abbha* or *thaneti*), wind-blown clouds (*vāta*) and rain clouds (*vassa*, S.III,254). He also mentioned *mahikā* which I. B. Horner translates as ‘snow clouds’ (Vin.II,295). If this is correct it may refer to nimbostratus clouds, those low, dark cloud formations which often produce hail or snow. The Buddha observed that rain falls in at least two different ways: in large drops (*thulla phusitaka*) as during a monsoon downpour, and in small scattered drops (*ekaṃ ekaṃ*), as when it is drizzling (A.I,243; S.I,104). He also commented that the failure of the rains could be due to such things as heat, wind or the clouds being blown out over the ocean (A.III,241). Simple people believed that rain was caused by sky spirits called *vitṭhibhūta*, although gods like Sakka and Vassavalāhakaḍḍevārāja, the Rain Cloud King, could also make it rain (Ja.I,330). It was commonly held that widespread immorality or an unjust ruler would disrupt rainfall, a belief the Buddha subscribed to. ‘It rains at the wrong time and fails to rain at the right time because of the bad king’ (A.II,74-5; Ja.II,124). Some ascetics preyed on people’s anxieties about the rains by claiming to be able to predict good or bad rainfall (D.I,11).

There is some evidence that the early Buddhists attempted to give naturalistic explanations for certain atmospheric phenomena related to seasonal changes. The *Milindapañha* asks why it is that the sun appears to shine with more glare in the winter when it is cool than in the summer when it is hot. The answer given is because in the summer the wind blows

dust into the atmosphere and the resulting airborne dust particles deflect the sun's rays (Mil.274).

2. Soils, Habitats and Topography

The soils found in the Ganges valley are mainly entisols, alfisols and ultisols with some vertisols. The *Vrkṣāyurveda* mentions three soil types- arid, marshy and ordinary - and further sub-divides these according to colour and fertility. The *Tipiṭaka* mentions a variety of soils - clay (*mattikā*), fine clay or kaolinite (*saṅhamattikā*), yellowish clay (*paṇḍumattikā*), sandy (*vālikā*), black alluvium (*kālijallikā*), pebbly and gravelly (*pāsāṇasakkharā*) and compact soil (*bhūmighana*). Salty soil (*ūsara*) known as *usar* in Hindi, refers to those patches of ground found in parts of Bihar which contain high concentrations of carbonate of soda, sulfate of soda, lime and magnesium (A.IV,237; Ja.III,580; M.III,94). The *Tipiṭaka* also comments that the soil in newly-deforested areas might be poor (*dubbhūmi*, D.II,353), and that the top soil in Avanti is dark and hard (*kaṇhuttarā bhūmi kharā*, Vin.I,197).

A wide variety of habitats are mentioned in the *Tipiṭaka*, most of them recognizable even today. Some of these are mixed forest (*omissakagahana*), dense jungle (*vana-saṅḍa*), sal forests (*sāla-vana*), grassland (*gaccha*), thickets (*pagumba*), dry thorny woodland (*kaṇṭaka-gumba* or *jaṅgala*), expanses of low scrub (*khuddak-gacchavana*), open scrub (*khubbanaka*), grass jungles (*tiṇa-gahana* or *tiṇa-dāya*), bamboo jungle (*veḷagahana*), uninhabited virgin forest (*nimmanussaka brahāraṅṅa*), waste land (*vivana*), rugged hills (*pabbata-visma*) and denuded hills (*muṇḍa-pabbataka*). Included also are the various wetland habitats such as river banks (*kūla* or *nadītira*), lakes (*daha* or *sara*), ponds and seasonal pools (*talāka*), flooded meadows (*kaccha*), swamps (*anūpa*) and marshes (*palīpa* or *udaka-daha*) with their reed banks (*nala-vana*), sedge plants and floating vegetation (*sevāla paṇaka pariyanaddā*). The *Jātaka* mentions semi-arid tracts (*kantāra*) and deserts (*maru-kantāra* or *nirudaka-kantāra*), which may be an early reference to Rajasthan's Thar Desert just beyond the western edge of the Middle Land.

Also mentioned are lowlands (*ninna*) which could have included floodplains: the *Jātaka* describes a lake around which 'some high ground, in hardened mud, grew lush green grass on which fed hares, deer and other light animals' (Ja.II,26)*. The large silt and sand islands (*pulīna*) formed by the annual flooding of the major rivers and which provides a home for animals like the swamp deer, are also mentioned. One *Jātaka* describes a body of water near a river which would join the river during

* According to ayurvedic theory, the flesh of animals described as light (*lahu*) supposedly have a drying effect when eaten and produce little mucus.

floods (Ja.II,79). This is a good description of what are called jeels or chauras in Hindi, old river-beds now cut off from the present river and which form long marshes or lakes. Other habitats included man-made ones such as the muddy, stagnant village ponds (*jambāla*) and the irrigation reservoirs and tanks (*pokkharanī* and *vāpi*) that dotted the countryside. These are filled with reeds, lotuses and other aquatic plants and became a home for crabs, mussels, fish and frogs as well as the birds that fed off them. Paddy fields (*sālikhetta*) too, were an excellent habitat for various animals.

The most important topographical feature of the Middle Land and one that had a profound impact on the environment was its rivers, the main ones mentioned in the Tipiṭaka being the Gaṅges, the Yamunā, the Aciravati, the Sarabhū, and the Mahī (A,V,22). The first two of these retain their names, the third is now called the Rapti while the identities of the last two are uncertain. Historically, natural watercourses have been categorized according to their size, from large to small, as rivers, streams and brooks, although these hydrologic distinctions are imprecise. Nothing like this categorization exists in the Tipiṭaka. Words such as *gaṅgā* and *nadī* were prefixed with *mahā* to indicate major rivers while other words like *āpagā*, *ku-nadī*, *sara* and *savantī* were combined with adjectives to indicate other types of watercourses, e.g. mountain brook (*girinadī*, Th.310), fast-flowing creek (*sīghasara*, Sn.3), shallow stream (*kunnadimuttānataḷaṃ*, Ja.III,221) or uncrossable rivers (*naḍīvidugga*, A.I,35)*. The *Milindapañha* mentions intermittent rivers, i.e. those that dry up in the summer, saying that they cannot be rightly be called rivers for this reason (Mil.114). An intermittent river is described as having 'large undulating sandbanks along its twisting and meandering course' (Mil.297). The Nerañjara which flows passed Bodh Gaya and several other rivers in the Middle Land could well fit this description.

Some of the rivers that flow through the Ganges plain are two, three or even more kilometres wide. When the Buddha and the monks and nuns who were accompanying him on his sojourns arrived at a river, they would often have to look for a boat or other craft or try to make a raft out of reeds and branches in order to get across (D.II,89; M.I,135-6). So for the Buddha, who spent much of his life traversing the country, rivers were, more than anything else, a challenging obstacle. It is not surprising, therefore, that he often used rivers and things associated with them as metaphors for the spiritual quest and its goal. He called the ordinary worldly state 'this bank' (*ora*) and Nirvana 'the further bank' (*pāra*). He named the first stage of enlightenment 'entering the stream', which would be a preliminary to swimming across a river. Attitudinal and emotional

The meandering of natural watercourses was noted and the Jātaka comments that: 'All rivers wind as they go' (Ja.I,289).

negativities like greed, hatred and desire were ‘torrents’ or ‘floods’ (*ogha*) that could sweep one away. He said of a monk who studied the Dhamma diligently that he is ‘one who knows a ford’ (*titthaṃ jānāti*, M.I,221). The cowherd Nanda assured the Buddha of his determination and ability to be a good monk by saying: ‘Lord, I will not get stuck on this bank nor will I get stranded on the far bank. I shall not sink in midstream and I shall not run aground on a sandbar. May the Lord accept me as a monk’ (S.IV,181). In one of his most famous similes the Buddha likened his teachings to an improvised raft, which, after it had been used, could be abandoned; the idea being that even something as precious as the freedom-giving Dhamma should not be clung to (M.I,136). Every time wayfaring monks or nuns found their progress blocked by a great river sliding silently along, or a simple cowherd like Nanda took his animals down to a river to drink, they would have been reminded of some aspect of the Buddha’s teaching.

The Buddha described rain storms in the mountains filling pools and lakes from where the water fed brooks and creeks (A.II,140). He also described a mountain river (*nadī pabbata*) as ‘winding this way and that, cascading, carrying everything along with it, not stopping for a minute, a second, an instant, rushing and swirling forward’ (A.IV,137). Such rivers might have grasses, reeds and trees overhanging both banks (S.III,137). Streams and rivers shape the landscape particularly when they are in flood. The Acivaratī (i.e. Rapti) was, and still is, notoriously prone to flash floods. When it rained in the river’s upper reaches in the Himalayan foothills, it would break its banks and sometimes wash away crops (Ja.IV,167). Flooding rivers allow for the migration of aquatic animals, the dispersal of seeds, the rejuvenation of wetlands (Ja.II,79-80) and the enrichment of the soil by depositing silt (*kalalagahaṇa*) and mud (*kaddama*) over the surrounding countryside. Mountain streams such as those in the lower Himalayas carry away sand, gravel and even rocks when in flood (Mil.197).

Not actually in the Middle Land but forming its northern border are the Himalayas, sometimes called the Lord of Mountains (*Pabbatarāja*, S.II,137). These mountains are only occasionally mentioned in the Tipitaka, as when it comments that the Buddha once stayed in a hut in a part of the Himalayas administered by Kosala (S.I,116). This must refer to the subtropical broadleaf forests or perhaps even the higher subtropical pine forest zone of Nepal or Uttarakhand. Rugged (*dugga*) and undulating (*visama*) areas, tableland (*bhumibhāga*), inhabited and uninhabited places and areas of great natural beauty in the Himalayas are also mentioned (S.V,148). The Jātaka says that the ascetics who lived in the Himalayas would leave in the rainy season when the leaves began to fall because it was difficult to dig up the bulbs and roots they lived on and to find wild fruit (Ja.III,37). The *Milindapañha* says that 500 rivers have their source in

the Himalayas (Mil.114). Most of the other references to these mountains are either stereotyped or idealized.

3. Taxonomy and Diversity

Pāṇiṇi classified all life broadly into two types - moving and still. Animate creatures were divided into humans and animals, and animals were sub-divided as either domestic or wild. The Buddha also sometimes classified life forms as moving (*tasa*) and still (*thāvāra*, Sn.146:394), and further classified animate life according to either the number of their legs or their mode of birth. Thus they are either legless, two-legged, four-legged or multi-legged (A.V,21), or alternatively, womb-born, egg-born, moisture-born or spontaneously-born, as in the case of divine beings (S.III,240). On one occasion only the Buddha differentiated animals according to their habitat as those living in burrows, in water, in the forest or in the air (A.II,33). This may be an earlier version of the habitational classifications proposed by Caraka and Suśruta.

According to the ancient Indian reckoning, all plants were of seven types: medical herbs (*osadhī*), forest-type trees (*vanaspati*), fruit and flower-bearing trees (*vrkṣa*)* shrubs (*gumba*), grasses (*tiṇa*), plants with tendrils (*patāna*) and vines (*vallī*). The Buddha classified them as either medical herbs, grasses or forest trees (*osadhī*, *tiṇa*, *vanappatayo*, A,IV,100). He considered plants to be a one-facultied life form (*ekindriya*), although he did not mention which faculty they possessed. He distinguished plants according to whether they were propagated by roots (*mūla*), stems (*khandha*), joints (*phulla*), cuttings (*agga*) or seeds (*bīja*, D.I.5).

The various theories of kamma being discussed during the 6th to 3rd centuries BCE may have been based in part on speculation on the analogy of generation in the plant world. Certainly, the concept of kamma was often explained in such terms. 'Whatever type of seed is sown, that is the type of fruit one reaps. The doer of good reaps good, the doer of evil reaps evil' (S.I,227). The Buddha called intentional good or bad deeds 'seeds' (*bīja*) and their kammic results 'fruits' (*phala*). He spoke of his order of monks and nuns as being 'an unsurpassed field of merit' (*anuttaram puñña-kkhetam*) where seeds of merit could be sown. To make some of his ideas more understandable he sometimes equated them with various agricultural tasks: 'Just as when a seed is sown in a field and grows depending on two factors, the nutrition in the soil and a good supply of water, so too, the aggregates, elements and the six bases of sense contact have come to be dependent on a cause and when the cause breaks up they will cease' (S.I,134). In another discourse he compared the various steps in

* The *Vrkṣāyurveda* says that *vanaspati* are trees that bear fruit without flowers and *duma*, probably the equivalent to *vrkṣa* are those that have both.

the spiritual life to the process of plowing: 'Faith is the seed, austerity the rain, and wisdom is my yoke and plough. Modesty is the plough-pole, mind the strap and mindfulness is my ploughshare and goad' (Sn.77).

Like any sensitive person, the Buddha was fascinated by the diversity of the natural world he saw around him. He commented: 'I know of no other type of living beings as diverse as those of the animal kingdom' (S.III,152). This awareness of and sensitivity to animals meant that he took them into account in his Dhamma, particularly in his cosmology and his ethics. According to his understanding, the animal kingdom (*tiracchānayoṇi*) is one of the six realms of existence beings can be reborn into, the others being purgatory, the realm of hungry spirits, of jealous spirits, heaven and the human realm. The Buddha believed that more human beings were reborn as animals than as humans (A.I,35) and that it was a distinct disadvantage to be an animal. It would be difficult, he said, to describe the suffering animals have to endure given that their whole world is dominated by 'eating each other and preying off the weak' (M.III,169). Likewise animals lack the ability to comprehend the Dhamma and have only the most rudimentary moral sense. As evidence of this he pointed out that animals will even mate with their offspring (A.I,51). Animals' moral and cognitive inferiority to humans did not mean that the early Buddhists considered them unworthy of consideration. As far as sensitivity to pain and the desire to avoid it are concerned, all beings are the same. The *Jātakamāla* says: 'Because animals are dull by nature we should have sympathy for them. When it comes to being happy and avoiding suffering, all beings are the same. Therefore if you find something unpleasant you should not inflict it on others' (Jm.25, 25-6).

It should also be pointed out that on several occasions the Buddha acknowledged that in some ways animals can be better than humans (M.I,341). Once he commented that an old jackal that was howling before sunrise had more gratitude than a particular monk he knew (S.II,272). On another occasion he rebuked some monks who were arguing and then added: 'If animals can be courteous, deferential and polite towards each other, so should you be' (Vin.II,162). The *Jātaka* makes this comparison between animals and humans: 'Easy to understand is the yelp of jackals and the song of birds. But to interpret what humans really mean when they speak is difficult indeed' (Ja.IV,217). It is interesting to note that some two centuries after the Buddha, one of the points discussed during the Third Buddhist Council was whether or not animals could be reborn in heaven. Those who believed that this was possible pointed out that *Erāvāna*, the mount of the god Indra, was an elephant. The Theravādins countered this by saying that if this was taken literally it would require that there also be stables, fodder, animal trainers, grooms, etc. in heaven, something that was considered to be clearly ridiculous (Kv.20,4).

While marvelling at the diversity of animal life, the Buddha was a careful enough observer to notice that humans are a single species, despite the widely accepted Brahminical claim that each caste represented a significantly different type. The Buddha's response to this claim was to say that the different biological and zoological species are separated by barriers to reproduction, with hybrids usually being sterile (M.II,153). Different human groups, by contrast, are clearly inter-fertile and thus must be a single species. He said:

‘Consider the grass and the trees. Although they do not speak of it, their characteristics are due to their species and truly there are many different species. Consider grasshoppers and ants... quadrupeds great and small... snakes with their long backs and which go on their bellies... water-living fish in their watery home... and birds, those wing-goers, those sky-travellers... In these species there are many different characteristics but amongst humans the differences are few. Not in hair or head, ears, eyes, mouth or nose, lips or eyebrows; not in neck or shoulders, belly, back or buttocks, chest, vagina or testicles; not in hands or feet, fingers or nails, calves or thighs, colour or voice is there any different characteristics due to species as in other creatures. The bodies of humans are not significantly different from each other as in animals.’ (Sn.601-10)

For the Buddha, if a distinction were to be made between human beings, it should be based on their individual behaviour or their level of comprehension, not on what caste they were born into. ‘Whether it be a castor oil tree, a *puṣimanda* or a *pālibhaddaka*, if a man looking for honey finds it there, then for him that is the best tree. Likewise, the best person is he from whom one learns the Dhamma, whether he be of the warrior, Brahmin or merchant caste, low caste or outcaste’ (Ja.IV,205).

That special regard for animals which later became such a feature of Indian civilization and which in part was due to the influence of Buddhism, was still in its infancy during the Buddha's time. Animals were still being slaughtered at Vedic sacrifices although this was being looked upon with increasing unease. Indeed, the Buddha was one of the most vocal critics of these bloody rituals (A.IV,41; 50). He condemned animal sacrifices as being both cruel and wasteful. He said his monks might attend a sacrifice but only on condition that no bulls, goats, sheep, poultry or pigs were slaughtered, no trees were felled to make sacrificial posts and no grass was cut for use in the sacrificial ritual (D.I,141). For the Buddha,

gentleness and kindness to all was a fundamental moral principle and also an essential step in an individual's spiritual development. The first requirement in his code of moral discipline is to 'abstain from killing, to lay aside the stick and the sword and to live with care, kindness and compassion for all living creatures' (D.I,4). Anyone who wanted to be his disciple was expected 'not to kill, encourage others to kill or approve of killing' (A.V,306).

For the Buddha, love and compassion were incomplete if they were not extended to all sentient beings. He said that if a monk found an animal in a trap and out of compassion set it free, he would not be guilty of theft, even if conventional opinion considered the animal to be the property of the hunter who had set the trap (Vin.III,62). Even the most insignificant life forms should, the Buddha said, be included in the ambit of a person's kindly regard. One of the eight things that he allowed his monks and nuns to have as their personal property was a strainer to filter tiny creatures from water (Vin.II,118). Monastics were expected to check water before using it for watering plants or bathing to make sure there were no creatures in it (Vin.IV,48-9). It was these tiny creatures that the Buddha was alluding to when he said that he had 'compassion even for a drop of water' (M.I,78). Monks and nuns were also asked to avoid unnecessarily damaging plants and their seeds (M.I,345).

These and similar ideas amongst the Jains had a profound effect on the Indian attitude to animals and later on all the peoples amongst whom Buddhism spread. In India, it became a custom during the summer to draw water from wells and put it in troughs for wild animals to drink (Ja.II,70) and to put baskets in trees or under the eaves of houses for birds to nest in (Ja.II,361). People would observe what were called non-killing days (*māghāta*) when no animals would be slaughtered and no meat would be available in the markets (Vin.I,217). Such days would be announced by the beating of a drum (Ja.IV,428). At a later period such non-killing days were given legal sanction by various Buddhist, Jain and Hindu monarchs.

4. Vegetarianism

Vegetarianism eventually became common in India although Buddhism, at least early Buddhism, did not have a direct role to play in this development. Vegetarianism was practised by some of the unorthodox sects of the time. One of the ascetic practices the Buddha adhered to before his enlightenment was abstaining from meat and fish (M.I,77); the Ājīvakas and Jains were vegetarian (M.I,238), although others were not. The ascetic Kaṭāramuṭṭhaka, for example, had taken a vow to consume only meat and alcohol although this did not prevent him being highly esteemed by the people of Vesāli (D.III,9). The Buddha did not require

either his monastic or lay disciples to abstain from meat. As far as monks and nuns were concerned, it was acceptable to eat meat on the condition that they did not see, hear or suspect that the person offering the meal had killed the animal specifically for them (M.I,368-71).

There are several places in the Tipiṭaka that mention in passing the Buddha or certain monks or nuns eating meat. The Aṅguttara Nikāya comments that a man sent his servant to the market to buy meat so it could be prepared and offered to the Buddha (A.IV,187). Another text describes how a group of people 'boiled porridge and rice, made soup and minced meat' (*maṃsāni koṭṭenti*) while preparing a feast for the Buddha and his monks (Vin.I,239). On another occasion some men slaughtered a cow, cooked it and then one of them gave 'the choice cuts of the cooked meat' (*maṃse pakke varamaṃsāni*) to a nun who subsequently dressed it and offered it to the Buddha (Vin.III,208). A monk who was possessed by a malevolent spirit is said to have gone to 'the place where pigs are slaughtered' and eaten raw flesh and drunk blood, apparently the accepted cure for this affliction. According to the Vinaya the Buddha permitted this rather drastic remedy (Vin.I,21-2).

There are sufficient references in the Tipiṭaka to show that meat-eating was the norm during the Buddha's time. Slaughterhouses are occasionally referred to (Ja.VI,62; M.I,130; Vin.I,202) and people are often mentioned consuming the meat of domestic and wild animals. Meat would be roasted or minced and it would be preserved by drying or salting (Ja.I,243; II,245). The fact that hunters were grouped with bamboo workers, flower scavengers and carriage makers as those practising a despised occupation (A.I,107) is not evidence that killing animals was widely disapproved of. These occupations may have been looked down upon, not because they were considered immoral or impure, but rather because the groups that did them, *caṇḍala*, *pukkusa* and *sudda*, were considered so.

That the early Buddhists were familiar with the complex food taboos of Brahminism is evidenced by the comment in the Jātaka that 'those of the warrior caste may knowingly eat the meat of the five five-clawed creatures' (Ja.V,489). According to Brahminical legal texts it was forbidden to eat the meat of animals that had five claws and two rows of incisor teeth. The exceptions to this rule, the so-called five five-clawed creatures (*pañca pañca nakha*), were the porcupine, hedgehog, hare, tortoise and monitor lizard. The Buddhists argued against or more usually simply ignored many of the superstitions of the time, including Brahminical food taboos. Monks and nuns were not allowed to eat the flesh of certain animals, although the reasons given for such prohibitions were rational ones. Eating elephant and horse flesh for example, might bring unwelcome attention from kings who regarded such animals as symbols of royalty. Dogs and snakes were widely considered loathsome

and eating them would attract social disapproval. Lions, hyenas and other large predators were believed to be able to smell the meat of their kind on someone who had eaten it and would attack them. The evidence given for this last reason was that some hunters had offered lion meat to a forest-living monk who ate it and was subsequently mauled by a lion. A similar thing happened to monks who ate tiger, leopard and bear flesh (Vin.I,219-20).

In the Tipiṭaka it is the Jains who are depicted as the strongest advocates of vegetarianism and on this issue they were also noisy critics of the Buddha. In one Sutta they are depicted as follows: ‘Many Jains went through the town, through the main roads and side streets, the alleys and the lanes, waving their arms and shouting; “The general Siha has this very day slaughtered a large creature to feed to the monk Gotama and he is going to eat it knowing that it was slaughtered specifically for him”’. (A.IV,187). Unlike the four Nikāyas, the somewhat later Jātakas have divergent voices on the issue of vegetarianism. Adhering to the earlier position that monastics can eat meat if they have not seen, heard or suspected that an animal was killed specifically for them, the Telovāda Jātaka goes as far as to say that even eating the flesh of one’s parent would be acceptable if such conditions were met (Ja.II,263). This is clearly hyperbolic but it does suggest that the pro-meat side of the debate was feeling pressure from the advocates of vegetarianism. At least three Jātakas (No. 75, 434 and 451) hint at a shift towards vegetarianism.

Whether or not the Jātaka stories can really be attributed to the Buddha as tradition maintains, they do give a good idea of the early Buddhist attitude towards animals. The animals in these stories are often depicted in a most sympathetic manner and sometimes in contrast to the greed, thoughtlessness and cruelty of humans. Even plants were sometimes attributed with having the noblest human-like qualities. According to one Jātaka story, wayside trees lowered their branches so that hungry and weary travellers could reach their fruits (Ja.VI,513).

Despite the humanizing influence of the Buddha’s teachings, cruelty to animals was common enough both during his time and later. Butchers, hunters and fishermen are occasionally mentioned and the Jātaka comments that ‘elephants are killed for their tusks and leopards for their skins’ (Ja.VI,61). There are also incidences in the Tipiṭaka of children tormenting animals and the Buddha admonishing them for doing so (Ud.11). Despite claiming privileges because of their priestly role, some Brahmins built huts in the forest and set traps to catch hares, cats, monitors, fish and tortoises, something the Buddhists criticized them for (Ja.IV,364). Villagers supplemented their diets by hunting wild animals in nearby forests and gathering honey and eggs from them.

Early Buddhist texts warn that those who kill animals; fishermen, hunters of wild pigs and butchers who slaughter bulls and goats; will all be reborn in purgatory (Ja.V,270; VI,111). Later Buddhist texts such as the *Mahāvastu* describe some of these infernal realms and the actions that could lead to rebirth in them. In doing so, it also gives an idea of the cruelty that was sometimes inflicted on animals:

‘Those who in the world cause worms to be squashed, the earth to be dug up... who beat creatures with clubs with the leaves still on them, or who crush nits, lice and *sāṅkuśas*, are reborn there as a maturing of their karma ... Those who in the world enslave beings who are without protection or refuge, who set houses or forests on fire, who light a fire at the openings of the dens, burrows, lairs and nests of *sāhikas*, monkeys, rats, cats, and the holes of snakes, watching their exits, who destroy bees with betel leaf or fire, have rebirth there as a maturing of their karma ... Those who have crushed the heads of living creatures such as snakes, centipedes and scorpions, have their heads crushed as the maturing of such karma ... Those who in the world have caused living beings to be fed to lions, tigers, panthers, bears and hyenas, are themselves devoured as the maturing of such karma ... Those who in the world scatter grain as bait for deer, buffaloes, pigs and wild cocks, saying; “We shall kill them and eat their fat flesh” are blown on by icy wind as a maturing of such karma.’ (Mv.I,21-5)

In later centuries some Buddhists came to consider even unintentionally and indirectly causing animals to die to be morally wrong. The Chinese pilgrim Yijing who travelled through India during the 7th century described approvingly the inordinate lengths monks would go to in order to ensure that there were no minute creatures in the water they used and to save them if there were. This concern for insects seem to have gradually soured monks’ attitude towards agriculture and must have alienated them from a good proportion of the population. Early Buddhists considered agriculture to be a noble (*ukkattatā*) means of livelihood because it provides people with their sustenance (Vin.IV,6). By Yijing’s time farming was looked upon as reprehensible. He mentioned that some monastic communities rented out the land they owned and took a percentage of the crop, which was in accordance with the Vinaya (Vin.I,250). Less scrupulous monks did the same but also supervised and even participated in the farming. Yijing criticized this, saying: ‘By ordering

about the hired men who work the fields, they inevitably arouse their resentment, and by digging the soil to plant seeds as well as plowing land are libel to injure ants and other insects...’ Then he added: ‘Nothing is more harmful to insects and more obstructive to good deeds than the cultivation of land.’ No doubt Yijing was reporting the general attitude of the more strict Indian Buddhist monks of his time.

5. Forests, Deforestation and Arboriculture

By the 5th century BCE large areas of forest* in the Ganges plain had already been cleared to make way for agriculture. The Buddha described how a fire would ‘burn through the undergrowth, ignite the woods and keep burning until it came to a clearing, a cliff, rocks, water, beautiful greenery or a patch of bare ground where it would burn itself out for want of fuel’ (A.IV,73-4). This could well be a description of the fires that were set to push back the forests. The Vinaya mentions a fire spreading to some dwellings from the adjacent forest and of burning a fire-break (*paṭaggim-datūm*) to prevent such a thing reoccurring (Vin.II,138). The Buddha also mentioned ‘a farmer taking a plough and seed, going to a forest clearing with poor soil covered with stumps and planting the seeds’ (D.II,353). The Jātaka tells of a Brahmin felling trees on the bank of the Aciravati River in order to cultivate the land (Ja.IV,167). There was a class of people known as forest burners (*dava-dāhaka*, Vin.II,138). Whether they were farmers engaged in slash-and-burn cultivation or men employed to clear forested areas we do not know. Whatever the case, these and other references to clearing the forest by axe or fire suggest that at the time the Pāli Tipiṭaka was composed there was still extensive forests and that fires in them were common occurrences. King Asoka’s 5th Pillar Edict issued 243 BCE in which he forbade setting fire to forests is further evidence of this. Of course, not all such fires were man-made. The Jātaka describes a forest fire (*davaggi*) being started by the friction of two tree branches rubbing together (Ja.I,216).

That some forest tracts were spared human encroachment may have sometimes been due to the fauna they sheltered. The Vyaggha Jātaka tells of two tree spirits who shared their forest with a lion and a tiger. Because of the stench of carrion left by the two predators, one of the tree spirits decided to frighten his neighbours away, against the good advice of the second tree spirit. As soon as the nearby villagers noticed the absence of lion and tiger tracks ‘within days they cut down the forest, made fields and brought them under the plough’ (Ja.II,356-7). There is evidence that some forests were able to re-established themselves when, whether due to

* The Paramatthajotikā defines a forest (*vana*) as ‘a collection of trees growing in close proximity to each other’.

natural or man-made causes, human habitation went into decline. The Buddha mentions a man stumbling across the ruins of an ancient city deep in the forest (S.II,105-6).

Some stretches of forest wilderness were extensive enough that running out of supplies while travelling through them or losing one's way in them could spell disaster. A lone traveller might be reduced to drinking water from a puddle in a cow's footprint because nothing else was available (A.III,188). In extreme cases parents lost in the forest might be forced to kill and eat their child in order to survive (S.II,98). Villagers living near forests sometimes acted as guides for those wanting to travel through them. (Ja.II,335). There are records of this still being done some 500 years later. When the Chinese monk Faxian was in India in the early 5th century, the road from the Middle Land to the Deccan passed through such wild and thickly forested country that travellers had to pay local rulers to provide them with guides for the journey. Such guides would accompany the traveller for a certain distance before passing them on to another guide, and so on, until they emerged from the wilderness. Sometimes it was not distances or remoteness but humans that made forests potentially frightening. Lonely forest roads were the perfect place for robbers to operate from (Ja.I,332). These outlaws were well-known to strike from and then disappear back into 'impenetrable grass or trees, a gully or a great forest' (A.I,153-4; M.III,158). Some of these robbers would capture a party of travellers and release one of them to go and try to get a ransom for the others (Ja.IV,115). One of the most famous and dramatic incidences in the Buddha's life was his encounter with the murderous robber Angulimāla who operated in the forested area in Kosala (M.II,97-8).

The state regarded some forests tracts as important sources of products and revenue. The Rakkhitavanasaṇḍa, the Protected Forest Grove, near Kosambi, was probably so named because it was off limits to villagers who might otherwise harvest its resources (Ud.41). The Buddha encountered an elephant in this forest suggesting that it was a reserve for this animal, so important in warfare. Unauthorized removal of timber from state forests could result in being flogged, imprisoned or banished, even for a monk (Vin.III,44). Where allowed, people gathered fruit, nuts, grasses, leaves, honey and leaf manure in nearby jungles and forest tracts. Forests provided them with the flowers they used in their religious ceremonies and with which they adorned themselves. When the Buddha was living in the forest before his enlightenment he would sometimes encounter cowherds grazing their cattle, grass-cutters, people gathering twigs and wood-cutters (Ja.V,417; M.I,79). He observed that certain forests were thick with reeds and *sara* grass (D.III,75), both of which were used to make various household objects such as mats, ropes and brooms.

People cleaned their teeth by chewing the twigs of particular trees. The Buddha spoke of the advantages of using such tooth sticks (*dantakaṭṭha*). It is good for the eyes, the breath does not have a bad smell, the taste buds are cleaned, bile and phlegm do not mix with the food, and food becomes more palatable (A.III,250). Twigs of the betel vine are the only wood mentioned as being used for this purpose (Ja.I,232), but twigs from the Toothbrush Tree (*Streblus asper*), Neem (*Azadirachta indica*) and Babul (*Acacia arabica*) may have been used too, as they are by village folk in Bihar even today.

Poisons were another product derived from forests, or at least from the wild. The *Arthaśāstra* states that one of the jobs of forest officers was to collect floral and faunal poisons. Toxicology (*visavijja*, D.I,8) was a recognized science by the Buddha's time although he designated trade in poisons an unethical means of livelihood (A.III,208). Poisons were used in warfare, in hunting, in baits laid to destroy vermin and probably sometimes in food to kill enemies and rivals, although no incidents of these kind are mentioned in the Tipiṭaka. The *R̥g Veda*, the *Suśrutasaṃhitā* and other later literature mention the use of poison arrows in combat. On several occasions the Buddha described a man being shot with a poisoned arrow and a physician's attempts to extract it, draw off the poison and heal the wound (M.I,429; II,216; see also Ja.I,273). Snake venom, putrid snake flesh and plants provided poisons. The poison used on arrows was probably derived from plants of the *Aconitum* genus, in particular *A. ferox*, the tuber of which is highly toxic. Tribal people in India were still using this poison on their arrows in the early 20th century.

Uses were even found for India's numerous thorny trees and bushes, otherwise considered a curse. They would be planted to make formidable hedges and their branches were cut and made into kraals where cattle were penned at night to protect them from predators (Vin.II,154). Villagers clustered thorny branches around the base of their fruit trees to discourage people climbing up and stealing the fruit (Ja.VI,348). The more extreme ascetics sometimes lay on beds of thorns as a form of self-mortification (D.I,167; Ja.III,235). Of the numerous medical herbs mentioned in the Vinaya, many grew wild.

But of course the most important resource derived from the forests was timber. Buildings, agricultural implements, boats, buckets, household articles, musical instruments, carts and wagons all required wood (Ja.I,250; Vin.II,170) as did cooking fires. The Alinacitta Jātaka suggests that even forests remote from human habitation were being exploited for timber on a large scale and in a systematic manner. According to this story, all the carpenters from a particular carpenter's village would embark on regular trips up a river to where it ran through a thick forest. They would chop down suitably large trees, shape beams and planks for house building, and

put together the framework of one-story and two-story houses, numbering all the pieces from the central post outwards. When they had enough they loaded all the timber onto boats and rowed downstream to their village. There they would build houses to order as and when they were required (Ja.II,18).

As timber was the major building material the carpenter's trade was important although there is no mention of it being considered a high or a low one. On several occasions the Buddha conversed with a carpenter named, or more likely nicknamed, Five Tools, suggesting that there were five standard tools used by these tradesmen (M.I,396). We are not informed what these tools were but in other places carpenters are mentioned using a *vāsi* perhaps an adze or chisel, a *muggara* or hammer, a *kālasutta*, a measuring line, a *nikhādana*, perhaps an iron rod for splitting logs and a *kakaca* or saw (Ja.IV,30; 344). There is a reference to a double-handled saw, the type two men would use to saw large logs into planks (M.I,129).

The fortifications of some cities and towns were wooden. There is mention of a royal lumber yard in Rājagaha which provided wood for repairs in the city, probably including the city's walls (Vin.III,42). Kusinārā, where the Buddha passed away, was described as *kudda...ujjāṅgala...sākha naḡaraka* (D.II,146) which probably means that its fortifications consisted of a long mound of rammed earth or mud with a palisade running along its top, or perhaps with sharpened stakes projecting from it. Potash, probably derived from burned wood, and ash itself were used as cleaning agents (A.I,209; S.II,131). Wood must have been used to bake bricks, although interestingly, there is only one reference to baked bricks or baked brick structures in the Sutta Piṭaka, the Brick Hall at Nādikā (D.II,200). The Buddha described a potter's kiln belching smoke on first being ignited, indicating that wood rather than charcoal was used in the pottery industry (A.IV,101). However, large amounts of charcoal must have been required for the newly emerging iron industry. A choice estate granted to a Brahmin by a king was described as having 'abundant grass, wood, water and grain' (D.I,87).

Others who depended on the forest only more so were the tribal people, sometimes called *aṭavī* or *milakkha*. The Jātaka mention these people hunting birds and worshipping water (Ja.IV,291; VI,207). The Buddha considered it a distinct disadvantage to be reborn in the border areas (*paccantimesu janapadesu*) where the unintelligible tribal people (*aviññātāresu milakkhesu*) lived (A.IV,226; S.V,466), probably a reference to those places where farmland met forest and where settled Aryans came into contact with hunter-gatherers. He also mentioned that one of the fears a mother could have for her son was that she might not be able to reach him during a raid by forest dwellers (*aṭavi sankopa*, A.I,178). In his 13th Major Rock Edict King Asoka pleaded with the tribal people to stop

causing trouble and warned them that he had the power to chastise them if they did not. Reading between the lines we can assume that troublesome tribes were doing no more than resisting encroachment of their forest homes by farmers, foresters and hunters.

Scholars have pointed out that the ancient Indians saw the forest as the setting for either the hunt, the hermitage or exile. Only the second of these has any significance in early Pāli literature. Hunting is occasionally mentioned, usually in a condemnatory manner, and there is only one mention in the four Nikāyas of people being exiled to the forest. According to the Buddha, his clan, the Sakyans, traced their origins back to the four sons of King Okkāka who he had exiled to 'the slopes of the Himalayas beside a lotus pond in a great grove of teak trees' (D.I,92). Being somewhat later than the four Nikāyas and dealing with a broader range of subjects, the Jātaka includes several stories in which forest exile features. In some stories, royal personages flee to the forest to escape political intrigue (No. 461 and 478) and in one a courtier goes to live in the forest so as not to be a party to a murder (No. 530). The kings in two stories are banished to the forest because their behaviour is deemed unacceptable (No. 337 and 347) and in another story a king renounces his throne and retires to the forest because he is afflicted with an incurable disease (No. 519).

Others who are occasionally mentioned as resorting to the forests were those wanting to escape from oppressive rulers. One Jātaka story tells of a king so bad that many villagers simply abandoned their homes and went to live in the forest. In other cases villagers fled to the surrounding forest during the day, only returning in the evening so as to escape harassment by the king's men (Ja.V.98-9). It was possible for such groups to establish small settlements in the forest and sustain themselves by hunting and gathering (Ja.IV,289). It would seem therefore, that there were still forests extensive enough or wild enough to be beyond the king's writ.

Domestic plants and their by-products were equally important in the lives of the people. The mention of a royal safflower nursery (*kusumbhavatthu*) suggests that royal courts may have maintained gardens to provide them with vegetables and various plant products (Ja.I,499-500). Farmers cultivated numerous types of grains in their fields, vegetables in their gardens and fruit trees in their orchards. These crops could be damaged by 'afflictions' such as strong winds, mice, insects, parrots and stork borers (Ja.V,401). They could also be damaged by hail (*karakavassa*, Ja.IV,167; Mil.308). If the damage was extensive enough people would die of starvation and whole villages and towns would be depopulated (A.I,160). Fields bordering forested areas might also be raided by deer

(Ja.I,152) and to prevent this farmers would 'dig pits with sharpened stakes and set snares, gins and traps'(J.I,143).

The Tipiṭaka also mentions animals and plants or their by-products that were not native to or produced in northern India but were nevertheless known, either through hearsay or because they were imported from elsewhere. Sindh horses, sandalwood, marine turtles, yak tails, coral, pearls and whales are all examples of this. The Himalayas were already known to be a source of potent medicinal herbs and some of these were imported into northern India also.

6. Names and Perfumes

Plants and animals had an important part to play in the cultural life of the Buddha's India. Some were admired enough for children to be named after them. Thus the Tipiṭaka mentions names such as Lion (Siha), Banyan (Nigrodha), Lizard (Godha), Jackal (Sigāla) and Blue Water Lily Hue (Uppalavaṇṇa). On the other hand, being called a camel, a ram, an ox or an ass was considered an insult (Vin.III,12). Feminine beauty was likened to objects from nature. A young woman could be as slender as a *kālā* bush (Ja.VI,269), have hands as soft as cotton (Ja.V,204), be doe-eyed (Ja.V,215), have teeth like pearls (Ja.V,203), lips as red as *bimba* fruit (Ja.V,452) or nipples swollen and firm like ripe dates (Ja.V,302). Less flatteringly, she might also have a mind like a monkey (Ja.V,445). A maiden could be as fair as 'a *kaṇikāra* tree blossoming in a sheltered glade' (Ja.VI,269) while a comely youth could be 'young, handsome and tender as a bean sprout' (Ja.III,394).

The Buddha and his enlightened or more advanced disciples were often compared to or equated with various animals, the most frequent being the bull-elephant (*nāga*), the lion (*sīha*), the bovine bull (*āsabha*) and the thoroughbred horse (*ājāṇiṇiya*, Dh.p.322; S.I,28-9; Sn.684). These very animals are depicted on the abacus of the capital of the pillar King Asoka erected at Isipatana where the Buddha delivered his first sermon. The first three are also the crowning animals of all surviving Asokan capitals while the last is mentioned in one literary source as crowning the pillar in Lumbini. Different opinions have been given as to why Asoka chooses to feature these four animals on his pillars. It has been suggested that they represented the four directions, that they were symbols of royalty, of fertility, or because of their supposed cosmological or astrological significance. It is much more likely that Asoka's choice was simply a continuation of what the earliest texts had done; identifying the Buddha with animals that were revered for their perceived stateliness, nobility and admirable habits.

The Buddha and the bull-elephant both favoured living in the forest away from others (A.IV,435-7; Ud.41-2). His bold and confident claim to be enlightened was reminiscent of the lion's fearless roar (A.II,33; V,33; S.V,227). Like sincere monks well-bred horses respond quickly to training and move with deliberation and mindfulness (A.I,244-6; II,114; III,248; M.I,446). And just as the bull is recognized as the natural and rightful leader of the cows and calves, the Buddha's spiritual attainments made him preeminent amongst humankind (M.I,226). Even in later texts such as the *Mahāvastu*, the Buddha was still being called a bull-elephant man, a lion man, etc (Mv. I,229; II,133).

The ancient Indians were sophisticated connoisseurs of aromatics and odorants. As part of their efforts to explain and understand the world they analyzed the senses, their objects and sense experience, including olfactory experience. The Buddha listed pleasant odours as coming from either roots, heartwoods or flowers (S.III,157). Later he expanded this list to include odours from softwoods, bark, fruit, leaves, shoots and resins or saps (S.III,250). Later still the *Dhammasaṅgāṇi* expanded these lists further to cover odours in general and their aesthetic properties. 'Odours which are derived from the four great elements, are invisible and have an effect are root odours, heartwood odours, bark odours, leaf odours, flower odours, fruit odours, raw flesh odours, putrid odours, pleasant odours and unpleasant odours' (Dhs.625). It will be noticed that all the odours in the first two lists are derived from plants as are the majority in the *Dhammasaṅgāṇi* list. When the Buddha's contemporaries thought of perfumes and scents they thought of plant substances.

People washed themselves with fragrant abrasives (*nahāniya-cuṇṇāṇi*), applied perfumes and unguents (*gandhālepa*) after their baths and sprinkled perfumed water on the floors of their homes as a sort of ancient air-freshener (Ja.I,399). Valuable brocades would be stored in scented chests (A.I,248) and when clothes were returned from the laundry they might be put in a scented chest to remove the smell of the cleaning agents (S.III,131). However, because perfumes and scents were associated with luxury and sensual indulgence, the Buddha asked his lay disciples to forgo their use, at least during Uposatha, the monthly full moon and half moon days (A.I,212). Perfume, probably in the form of incense powder or sticks, was as essential a part of a funeral as were sweet-smelling garlands (D.II,159; Ja.III,163) and the rich might have sandalwood burned in their funeral pyres (Ja.V,136). Perfume played a part in religious practices. Incense was offered during *pūjas*, scented oil was burned in lamps (Ja.II,104) and perfumed water was sprinkled around sacred trees (Ja.II,104-6; III,23). The Buddha approved of offering garlands, perfume and coloured paste (*vaṇṇaka*) at the shrines of enlightened saints (D.I,142).

Then as now the perfume *par excellence* was sandalwood. This wood was used as a powder (*cuṇṇa*) or an unguent and fragrant oil was extracted from it also (D.II,137; Ja.IV,440; Mil.321). That Vārāṇasi was already a centre for perfume manufacturing and trade is implied by the Buddha's comment that when he was a layman he used no sandalwood unless it came from that city (A.I,145, Ja.V,302). Perfumes were probably also included in the various cosmetics and salves people used, the 'eye ointments, garlands, scents, face powders and face creams' (*anjanam māla vilepanam mukkhacūṇṇakam mukkhālepanam*, D.I,7). Although several flowers used in perfumery are mentioned in the texts the only perfume actually named other than sandalwood is *sabbasaṃhāraka*. As its name suggests this must have been made from a mixture of the most expensive and fragrant aroma compounds. A character in the Jātaka says she could never afford *sabbasaṃhāraka* and that she perfumed things with *piyangu* flowers (Ja.VI,336). The Tipiṭaka makes no mention of saffron or perfumes made from animal products such as musk or ambergris.

7. Gardens and Hunting

Plants and animals provided the ancient Indians with opportunities for recreation and entertainment. The earliest mention of horticulture from India is to be found in the Tipiṭaka, although admittedly the evidence is scant. There are many references to parks, gardens and pleasancess (*ārāma*, *upavana* and *uyyāna*).

The Buddha commented that Rājagaha, the capital of Magadha, was adorned with numerous such places; Jivakārāma, Latthivana, Paribbājakārāma, Sītavana, Taporāma, Udumbarika Paribbājakārāma and Veḷuvana (D.II,116). Some of these places may have been small surviving patches of wild forest on the outskirts of towns and cities, others were orchards and a few were undoubtedly carefully designed and cultivated gardens. The purpose of these last places was to provide the enjoyment that can be derived from natural beauty; greenery, cool shade, and the colour and fragrance of flowers. It is perhaps significant that the common word *ārāma* means both garden and delight.

Some gardens may have been part of royal palaces or the mansions of the rich but most of these seem to have been beyond city walls. Archaeological investigation has shown that at least two of them, the Jetavana and the Veḷuvana, both offered to the Buddhist order by royals, were within walking distance of a major city, Sāvattī and Rājagaha respectively. The first of these was described by the Buddha as being 'not too near (the city), not too far, convenient for coming and going, quiet, secluded from people, good for sitting without being disturbed and conducive to spiritual practice' (Vin.I,39). Such attributes would have been

an obvious attraction for meditating monks but they may of also have been valued by the Veļuvana's original owner, Bimbasaṛa the king of Magadha. Lay people too may have retreated to gardens to temporarily 'get away from it all' and to reflect in the peace and quiet they offered.

The fact that Buddhist monks and other ascetics are often mentioned as congregating in parks and gardens and that their lay devotees would sometimes visit them there, indicated that some at least were open to the public. Other were reserved for their owners' use only. These private gardens might be surrounded by a wall with a gate, laid out and maintained by gardeners (*ārāmaropa*, S.I,33) and protected from intrusion by park wardens (*ārāmapāla*, *ārāmarakkhaṇaka*, Ja.I,251, Vin.II,109). A royal pleasure garden might have a stone bench, a swing and inevitably a pond or lake with lotuses and water lilies of different colour, steps leading down to the water at certain places and inlets to enhance its interest (Ja.II,189). Later references to pleasure gardens in India mention other enhancements such as artificial mountains, bowers, bridges, pavilions and water machines, i.e. fountains (*jalayantra*). A king would retire to his pleasure garden to be entertained by female musicians and dancers (Ja.III,40) and during festivals and holidays he and his court would participate in what the commentary calls 'garden games' (*uyyāna-kīḷana*). Unfortunately we have no information about what these games consisted of. Another activity people enjoyed in gardens was feeding animals. The Veļuvana in Rājagaha had a place for feeding squirrels and another for feeding peafowl (e.g. M.I,145: II,1).

A few very brief references suggest that beautiful or interesting trees and shrubs would be laid out in particular patterns to enhance the attractiveness of gardens. One source mentions a line of palm trees and borders or walkways of sand (Ja.I,201). The careful design, layout and cultivation of these gardens is further hinted at by the comment that it could take from two to four years for one with good soil (*sārabhūmi*) and proper management to be up to standard (Ja.II,188). So much did the ancient Indians enjoy their gardens that they assumed there must be some in heaven. The description of a celestial garden may add something to our knowledge of their earthly equivalents. Near the heavenly palace there were ponds with different coloured lotuses, stocked with fish and bordered on two sides by well-trimmed fruit and flower-bearing trees (Vv.81,4-7). The gods were believed to delight in watching the flowers as they budded, bloomed and faded, discussing each blossom's colour, perfume and shape, just as humans must have done (A.IV,117).

A pastime less edifying than enjoying oneself in a garden was staging and watching animal fights. Large animals such as elephants, buffaloes, bulls, goats and rams were set to fight each other. Cock and quail fighting were also popular. The Buddha disapproved of monks

watching such fights, probably because of the cruelty involved and perhaps because gambling took place during them (D.I,6). Another pastime involving animals was the chase. Apart from hunting as a livelihood, to supplement the diet and to provide commodities such as ivory and hides, people hunted for entertainment. Big game hunting had already reached the form that was to maintain well into the 20th century. Local villagers were recruited or compelled by kings to provide labour for such hunts. They would form a long line, and then beating the undergrowth and blowing horns, drive the animals before them. Eventually they would form a circle and gradually decrease its size so that the animals trapped within could be dispatched by the king and his guests (Ja.I,150). We read of a king who threatened to fine any of his beaters who let a deer slip past them (Ja.III,325; IV,267).

Some forests were maintained specifically as hunting reserves. The Nigrodhamiga Jātaka briefly describes the setting up of one of these. Within a selected forested area fodder was sown, water was provided and a number of deer were driven in and confined there, although exactly how they were confined is not explained (Ja.I,150; IV,431). The *Arthaśāstra* described royal hunting reserves in very similar terms, adding that they were surrounded by a steep ditch so that access was only possible through a single entrance and that they were stocked with game animals and predators that had their claws and teeth removed. When the chase was on 'deer would dash around, trembling for their lives, but after one or two wounds they would faint and be slain' (Ja.I,150). The Vidhurapaṇḍita Jātaka includes a long, detailed and realistic list of do's and don'ts for one wanting to survive and prosper in the potentially dangerous world of the royal court. One thing it warns against is hunting deer in the king's forest (Ja.VI,294). Buddhist authors pointed out that hunters did not always make a 'clean kill'; a good number of their quarry 'escaped wounded into the bushes and thickets of the forest, into clumps of grass, reeds and brambles, and died, and were devoured by ravens and vultures' (Mv.I,359). One aspect of hunting which Buddhists particularly deplored was using one animal to hunt others or using an animal as a decoy to catch others. Doing such things was a sure road to an unpleasant rebirth (Ja.V,270; 375).

The most popular game animal was the deer of which several species are mentioned in the Tipiṭaka as being hunted. Venison was considered a tasty, literally a sweet, meat (Ja.I,155). We have a description of a deer hunter returning to the city with a cart full of venison with the intention of selling it (Ja.III,49). There are numerous references to hunting deer by villagers wanting to supplement their diets or protect their crops, by professional deer stalkers (*migaluddaka*) and by kings for sport and for the royal table (Ja.I.,137; II,153; III,49; IV,431; VI,170). Villages dug pits and set traps to catch deer and hunters built tree stands. Kings and nobles

preferred bows and spears and sometimes trained thoroughbred dogs (Ja.I,173; IV,437). Because of their timidity and alertness and because they were as 'fast as the wind' or as 'fast as wind-scattered clouds'(Ja. III,325; IV,268), it was no easy thing to bag a deer.

8. Human-Animal Interaction

Of the austerities practised by the various ascetic sects during the Buddha's time some consisted, in part at least, of imitating animal behaviour. The *Buddhacarita* says of some ascetics that they 'eat gleanings like birds, others graze grass like deer, yet others spend their time with snakes and some stand like anthills blown by forest winds ... others plunge into the water and live with the fish, their bodies nibbled by turtles' (Bc.7,15-17). Some ascetics walked on all fours (*cātukunḍika*), a practice the Buddha did for some time before his enlightenment (M.I,79). Some went naked and acted like cows, others imitated dogs, eating only what was thrown on the ground and curling up in a canine manner to sleep (M.I,387). The rationale behind such practices is not given in the texts. The Buddha disparaged all austerities, particularly ones that involved imitating animal behaviour. He said that to act like an animal would cause one to be reborn as an animal (M.I,387-8). Some ascetics acted like birds by eating only seeds they picked from wild grasses or gleaned from fields after the harvest. The Buddha allowed his monks to glean (*uñcha*), not as an austerity but as a way getting sustenance when food was scarce (A.III,66; 104; Thi.329).

As in other religious traditions, the first Buddhists had stories about humans and animals interacting to the degree of being able to understand and respond to each others' wishes, or even to talk to each other. It is not difficult to imagine how such stories could have begun. Animals would soon get used to any monks or nuns who shared their forest and no longer flee from them and perhaps even become tame, especially if they were fed. An outsider visiting a hermitage and seeing normally timid animals in the vicinity might well conclude that the hermit and the animals had some sort of relationship. The Jātakas contain numerous stories in which humans interact in a variety of ways with animals.

A good example of such stories would be the Amba Jātaka (Ja.I,450). Once, the Bodhisatta was born as a Brahmin in the North who, after he grew up, renounced the world and became leader of 500 ascetics living at the foot of the mountains. It happened that a terrible drought occurred in the Himalayan country so that all the water dried up and the animals suffered terribly. Seeing this and moved by compassion, one

ascetic cut down a tree, hollowed it into a trough and filled it with any water he could find. The animals came in droves to drink and the ascetic had to spend all his time finding water and keeping the trough filled. Heedless of his own needs he toiled for the benefit of the forest creatures to the degree that he had no time to gather his own food. Seeing this the animals agreed amongst themselves provide food for the ascetic. When they came to drink they brought mangos, *jambus*, breadfruit and other fruit until it equaled 250 wagon loads, enough for all the ascetics with some left over.

The four Nikāyas and the Vinaya also included several such stories. Once Venerable Moggallāna offered to get Venerable Sāriputta the medicine he needed for a fever he was suffering from - lotus stalks. He went to a great lotus lake, an elephant saw him there and asked how he could help him. Moggallāna told the elephant what he needed and the creature instructed another elephant to get it for him. This second elephant uprooted a trunk-full of lotus stalks, washed the mud off them, tied them into a bundle and then gave them to Moggallāna (Vin.I,214-5). Another story of animal helping humans is told in the Udāna. The Buddha left Kosambi in disgust at the quarrelsome monks there and went to a nearby forest at Pāṛileyya where he spent a few days staying at the foot of a sal tree. The elephant who lived in the forest cropped the grass around the Buddha and brought him water in its trunk (Ud.42). The ancient commentary adds that a monkey also provided him honey comb to eat (Dhp-a.I,59). This story ends by saying that great sages like the Buddha and noble animals such as bull-elephants both seek silence and solitude.

Once a certain monk told the Buddha that he was staying in a grove near a large area of low-lying swampy ground (*ninnam pālalam*) where flocks of birds foraged. In the evening the birds would roost in the monk's grove and disturb him, probably with their noise and their droppings. The Buddha advised the monk to go to the birds three or four times a night and ask them for a feather. They would, he said, soon get sick of these continual requests and go somewhere else. The monk did this and the birds eventually went away, just as the Buddha had predicted. The Buddha used this incident to warn his monks to be circumspect about asking lay people for things (Vin.III,147-8).

Stories based on the belief that animals can respond to human kindness and love are very common in the Buddhist tradition. The earliest of such stories concerns the Buddha and the tamed but unruly and dangerous elephant Nālagiri. Once, in an attempt to kill the Buddha, his evil cousin Devadatta arranged for Nālagiri to be released onto the road the Buddha was walking down. Trumpeting and with tail erect, the elephant charged the Buddha who, on seeing the furious creature coming, suffused it with loving-kindness. The elephant was suddenly transformed

from fury into docility. It approached the Buddha, took dust from his feet and sprinkled it on his own head, while the Buddha spoke to it gently and stroked it (Vin.II,195). In popular imagination saintly monks and nuns might even be able to influence the behaviour natural prey and predators have towards each other. One Jātaka story relates how a kindly ascetic taught a snake and a mongoose to overcome their instinctive fear of each other (Ja.II,53). This story might have been the basis for a similar one the Chinese pilgrim Faxian heard when he was in Sri Lanka. A particular revered monk had developed loving-kindness to such a level that the snake and rat who shared his cave lived in complete harmony with each other.

The theme of animal devotion to their human owners or to those they had become fond of, and then dying of a broken heart (*hadayena phalitena*) when parted from them, occurs several times in the ancient commentaries. According to the *Nidānakathā*, when Prince Siddhattha renounced his princely life to become a wandering ascetic his horse Kanthaka pined away and died (Ja.I,65). The elephant who had looked after the Buddha when he was on retreat in the Pārileyya forest was likewise said to have died when the Buddha left to return to the city (Dhp-a.I,63). Another story tells of a dog who pined away when the saint it has become fond of decided to reside somewhere else (Dhp-a.I,173).

9. The Wilderness and the Sangha

The forests of the Ganges and Yamuna valley were the environmental mainstay of the numerous religious sects that were proliferating between the 6th and 3th centuries BCE. The Buddha, and not only he, believed that the solitude and simple living which forest wilderness offered, were essential for meditation. Time and again he encouraged his monks and nuns to spend as much time as they could away from human habitation and in the jungle: 'Here are the roots of the trees, here are empty houses. Meditate, monks! Do not be slothful so that you reproach yourself later. This is my instructions to you' (A.III,87). He mentioned that some of his disciples would spend the whole year except the three months of the monsoon 'at the roots of trees and in the open air' (M.II,8). More commonly they would 'go to remote forest lodgings and having plunged into the forest, only join the monastic community every half month to recite the rules' (M.II,87). However, Buddhist monks and nuns could never go too far into the wilderness. Ascetics of other sects were allowed to pluck wild fruit and dig up edible roots, while Buddhist monks were not allowed by their rule to do either. As a result, they always had to be near habitation in order to get their food.

But even living in the forest within walking distance of a settlement or village could be a challenge. One had to conquer the fear of predatory animals and the constant irritation of insects. The monk Ghavaratiriya counselled a heroic stoicism towards this second problem: 'Annoyed by flies and mosquitoes in the forest, in the great jungle, be like an elephant in the thick of the battle and endure mindfully' (Th.31). For some monks at least, the long periods of solitude were even more difficult to put up with. Concerning this, the Buddha commented: 'Remote jungle lodgings in the forest are hard to endure. It is difficult to live in solitude, it is not easy to enjoy solitude. One might think that the forest must disturb a monk's mind, if he has no concentration' (M.I,17).

There were others who positively exalted in living in nature and away from their fellow humans. The monk Bhaddiya used to reside in the forest and every now and then let out the cry 'Oh joy! Oh joy!' The other monks found his behaviour rather peculiar and told the Buddha of it. The Buddha called Bhaddiya to him and asked why he was letting out this cry. Bhaddiya answered: 'Formerly, when I enjoyed the happiness of royalty, guards were set inside the palace and outside in the area beyond. Yet, although I was well-guarded, I lived in fear. I was anxious, trembling and afraid. But now that I live in the forest, all alone, I am assured, confident and fearless. That is why I utter the cry "Oh joy! Oh joy!"' (Ud.19).

Contemplating the future of the Saṅgha and suspecting that the desire for the forest life would be likely to fade, Venerable Phussa said that coming generations of monks would probably find 'the jungle wilds uncomfortable and go and live in the villages' (Th.962). During the Buddha's last years he too predicted that the Saṅgha would probably degenerate. One sure sign of this, he thought, would be that monks would no longer live in the forest (A.IV,21-2). The beginning of this trend is already present in the Vinaya. With the Saṅgha becoming more legalistic, a precise definition of 'the forest' was necessary. Technically, a monk's abode could be designated 'a jungle lodging' if it was 500 bows (*dhanu*) from the border of a village (Vin.IV.183). By the time of the *Visuddhimagga* (5th century CE) a monk qualified to be 'a forest dweller' if he lived the distance a stone thrown by man of average height standing at the precincts of a village landed (Vism.71-2).

The Tipiṭaka indicates that the attraction Buddhists monks and nuns had towards the natural environment sometimes went beyond the needs of their spiritual practice. Some of them were moved by the sheer beauty of the groves and hills, the flowers and the jungle pools, the rustle of the leaves and the songs of the birds. When someone told the Buddha that he found the forests frightening, he replied: 'At the midday hour when the birds are quiet, I find the rustle of the great forest delightful' (S.I,7). He specifically mentioned that he decided to settle down

to do his meditation at Uruvelā, in part because of the bucolic surroundings: ‘Then, being a seeker for the good, searching for the incomparable, matchless path of peace, while walking on tour through Magadha, I arrived at Uruvelā, the army township. There I saw a beautiful stretch of ground, a lovely woodland grove, a clear flowing river with a delightful bank and a village nearby for support. And I thought “Indeed, this is a good place for a young man set on striving”.’ So I sat down there, thinking “Indeed, this is a good place for striving”.’ (M.I,166-7).

The monk Bhūta claimed that the sylvan surroundings he meditated in filled him with the highest joy. ‘When the storm clouds rumble and pour down their torrents and the birds take to the sky, the monk who has gone to his grotto to meditate finds no greater delight than this. When happily meditating on the flowery river bank surrounded by the many and varied plants, he finds no greater delight than this. When night comes to the lonely grove with a shower of rain and the roar of the fanged beasts, the monk who has gone to his grotto to meditate finds no greater delight than this’ (Th.522-4). It was even suggested that the beauty of the landscape could be enhanced by the enlightened ascetics who chose to make it their abode: ‘Whether in village or forest, on hills or plain, wherever saints live, that is a delightful place’ (Dhp.98).

10. Natural Beauty

One of the most charming descriptions of the natural environment and its inhabitants in all of Indian literature is to be found in the eighth chapter of Bana’s *Harṣacarita*. Fanciful and romanticized though it be, it invites the reader to imagine humans and animals living in complete harmony with each other through the benign influence of the Buddha’s Dhamma. Bāṇa describes a beautiful woodland scene and then the sight that unfolded before King Harṣha as he approached the hermitage of the monk Divākaramitra nestled in the Vindhyan Hills. Ascetics of different sects, usually so quarrelsome, sat on rocks, in bowers of flowering creepers, amongst the bushes and at the foot of trees, quietly discussing points of philosophy:

‘Here some monkeys who had taken the Three Refuges were gravely bowing to the shrine, there some parrots skilled in the Buddhist texts were explaining the *Abhidharmakośa*, and elsewhere a group of mynas whose practice of the Vinaya had imparted to them great composure, were giving a sermon on the Dharma. Some owls having gained wisdom by attentive study recited various Jātaka stories. Several tigers who had given up

meat-eating under the calming influence of the Buddha's teachings quietly waited in attendance. Two lion cubs sat undisturbed near Divākaramitra, forming as it were, a natural 'lion throne' for him and emphasizing his spiritual greatness. Several deer seemed to imbibe his calmness as they licked his feet and he radiated loving-kindness while a dove sat in his left hand pecking grains of wild rice and looking like lotus buds that had dropped there from his ear. With his other hand Divākaramitra flicked refreshing water on a peacock, its neck like an emerald vase, and sprinkled panic seed or rice for the ants to eat, as the rays of light emanating from his body dazzled those assembled before him.'

The beauty of the natural world was a recurring and popular theme in the literary arts. The 'Long Description of the Forest' from the Vessantara Jātaka names about a hundred plants and nearly as many animals (Ja.VI,534-39). When recited by a bard, this long passage must have created a vivid picture of the beauties of the forest and its inhabitants in the minds of the audience. Several other shorter eulogies to nature are found in the Jātaka and the Theragāthā (e.g. Ja.VI,529-30; Th.1062-70; 1135-7). The Buddha too would sometimes conjure up a charming if idealized vision of the natural environment: 'Imagine that a man tormented and overcome with heat, wearied, craving and thirsty, were to come across a pool of clear, sweet water, a lovely resting place shaded by all kinds of trees. He would plunge into that pool, bathe and drink and coming out would sit and then recline in the shade of the trees' (A.III,190).

Poets used imagery from nature in their compositions, sometimes to the most pleasing effect. Trees were described as 'swaying in the breeze like young men full of their first drink' (Ja.VI,534) or as being 'studded with flowers of many hues like the night sky studded with stars' (Ja.VI,529). In a eulogy to detachment and solitude, the Khaggavisāṇa Sutta says:

Be like the lion not frightened by noise.
 Be like the wind not caught in the web.
 Be like the lotus not stained by the mud.
 Be alone like the rhinoceros' horn. (Sn.71)

Pañcasikhā's unusual but lovely poem about 'the Buddha, the Dhamma, saints and love' uses imagery from nature:

The elephant, oppressed by summer heat,
Seeks out a lotus pool upon which float
Petals and pollen of that flower,
So do I plunge into your sweet breast.

As an elephant urged on by the goad,
Ignores the sting of lance and spear,
So I, unheeding, know not what I do,
Intoxicated by your beauteous form.

By you my heart is tightly bound,
My thoughts disrupted, my mind and I
Can no longer find my former course:
Like a fish caught on baited hook. (D.II,266)

Plants and even more so animals were the subject of numerous superstitions and folk beliefs. Some people were believed to be able to make trees bear fruit out of season and to understand the cries of animals with the help of magic charms (Ja.II,105; IV,200). It was thought to be good luck first thing in the morning to see a white bull, a mother and child, a *rohita* fish, a pot full to the brim or newly-made ghee, or to touch grass, fresh cow dung, a clean robe or a *rohita* fish (Ja.IV,72-3). Likewise people believed that it was possible to foretell the future by examining the holes gnawed in cloth by rats or mice (D.I,9).

The existence of various fantastic creatures was also taken for granted. The *kinnara* was believed to be a creature with a bird's body and a human head, the *garuḷa* was a giant eagle-like raptor, the *mahoraga* was a serpent-like creature, the *dakarakkhasa* was an ogre that inhabited deep pools and lonely rivers. Other menacing beings that were believed to lurk in dark and lonely places were *yakkhas*, *rakkhasas*, *pisācas* and *supannas*.

The Buddha envisaged a time in the future when all India would be ruled by a king whose justice and wisdom would usher in an ideal society. This king would, he believed, not only act for the welfare of his human subjects but for domestic and the wild animals as well (A.III,149; D.III,61). It seems very likely that Asoka, the third emperor of the Mauryan Dynasty, saw himself as just such a 'universal monarch'. Apart from his many other innovations and reforms, Asoka 'made provision for two types of medical treatment; medical treatment for humans and medical treatment for animals. Wherever medical herbs suitable for humans or animals are not available I have had them imported and grown. Wherever medical roots or fruits are not available, I have had them imported and grown. Along roads I have had wells dug and trees planted for the benefit of humans and animals'. In 257 BCE Asoka publicly announced that the royal household was going to gradually become vegetarian. 'Formerly, in

the kitchen ... hundreds of thousands of animals were killed every day to make curry. But now, with the writing of this Dhamma edict, only three creatures, two peacocks and a deer, are killed and the deer not always. And in time, not even these three creatures will be killed.' Nine years later he had published a list of animals that were to be protected from then on and designated certain days as non-killing days. 'On the three Caturmasis, the three days of Tisa and during the fourteenth and fifteenth of the Uposatha, fish are protected and not to be sold. During these days animals are not to be killed in the elephant reserves or the fish reserves either. On the eighth of every fortnight, on the fourteenth and fifteenth, on Tisa, Punarvasu, the three Caturmasis and other auspicious days, bulls are not to be castrated, billy goats, rams, boars and other animals that are usually castrated are not to be. On Tisa, Punarvasu, Caturmasis and the fortnight of Caturmasis, horses and bullocks are not to be branded.'

Much has changed in northern India since the time of the Buddha. Except for the northern fringes of the Ganges and Yamuna plain the great stretches of forest have gone forever and with them numerous species of plants and animals. Many others are critically endangered and the pressure on them increases year by year. Whatever happens in the future, the Pāli Tipiṭaka will remain an important record of India's natural heritage and a valuable resource for environmental historians and others interested in India's past.

Flora and Fauna in the Pāli Tipiṭaka

There is no living being or thing that is not called by a name. The trees of the forest and the mountains are the business of the country folk. For they, on being asked 'What tree is this'? say the name they know, such as *khidira* or *palāsa*. Even when they do not know the name of a tree they will say 'That is a no-name tree.' And further, that will be accepted as the name for that tree. And it is the same for fish and tortoises in the ocean, and so on.

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A

Akka. Swallow Wort, Hindi *akaron*, *Calotropis gigantea* (Vin.I,306). A small stout shrub with a beautiful reddish or sometimes light purple flower. The juice of the leaves have medical properties, floss from the seeds is used as stuffing and in ancient times fibre from the stem was used to make bow strings (M.I,429).

Agaru. Aloes, sometimes *agalu* or *akalu*, Hindi *agar*, *Aquilaria agallocha* (Ja.VI,144; 510; 530). This slender straight tree has bright green leaves, snow-white flowers and can grow up to 20 metres high. The resinous wood is prized for its fragrant smell and the oil extracted from it is widely used in traditional medicine. As with sandalwood, aloes was ground into a paste on a stone and then rubbed on the limbs as a perfume (Ja.IV,440; Mil.338). The gods are described as being 'draped in garments of red and gold and fragrant with aloes, *piyaṅgu* and sandalwood' (Vv.53,7).

Agārasappa. Common Wolf Snake, *Lycodon aulicus*. The Pāli name means 'house snake'. The colour and markings of this snake are variable but it is usually light to dark-brown with yellow crossbars and it can grow up to 765 millimetres. Of all Indian snakes this is the one most commonly found in human habitation, whether in rural areas or crowded cities. It hides during the day and comes out at night to hunt geckos, skinks, mice, cockroaches and birds nesting in roofs. Although non-venomous, the wolf snake closely resembles the very dangerous krait and is often mistaken for it. Its discovery in a house usually causes consternation. The Jātaka describes a man carrying an unlucky robe on a stick 'as if he were carrying a house snake' (Ja.I,372).

Aṅkola. Sometimes *aṅkolaka*, Hindi *akola*, *Alangium lamarckii*, (Ja.VI,535). A small thorny bushy tree with oblong leaves, an ellipsoid black succulent fruit and beautiful white flowers. The flowers were used to make garlands (Ja.IV,440). Today, the bark and roots are used as a medicine for jaundice and the fruit is eaten.

Aṅgahetuka. The Large Green-billed Malkoha, *Phaenicophaeus tristis* (Ja.VI,538). This pigeon-sized bird is greenish-grey with a green bill, a patch of red skin around its eyes and has a long curved greenish-black tail with a white tip. Because it prefers dense scrub, it is usually only seen when it flies from one clump of bushes to another, at which time the white tip of its tail is very noticeable. The malkoha feeds on insects and small animals and is found in the lower Himalayan hills.

Accha. Sloth Bear, also called *ikka*, *Melursus ursinus* (Ja.V,70; 197, VI,538). This medium-sized bear has a shaggy black coat, a white v-shaped mark on its breast and a long white snout. It has a slow lumbering gait but can attack swiftly and without provocation. Sloth bears sometimes attacked forest-dwelling monks (A.III,100). Monks were allowed to have a bear skin mat (Vin.II,174) and to use bear fat as a medicine (Vin.I,200). Sloth bears have black hair and one cannot escape them even by climbing a tree (Ja.VI,507). One Jātaka story describes villagers finding a bear near their village and attacking it with arrows, sticks and staffs to drive it away (Ja.IV,327).

Acchiva. A type of plant (Ja.VI,535).

Aja. Domestic Goat, also *ajaka* and *ajiya*, Hindi *ajgar*, *Capra hircus* (It.36; Ja.II,278; V,241; M.I,344; III,167). Goats are medium-sized mammals related to sheep with backward-sloping horns and short tails. They were kept for their milk, meat and wool. We read of goats being slaughtered at sacrifices,

of long-haired goat getting caught in thorn bushes (S.II,228) and of a man keeping goats, living on the milk and making smoke to protect them from mosquitoes (Ja.III,401). There is an unusual Jātaka story in which an abandoned child is suckled by a goat (Ja.V,429).

Ajagara. Indian Python, sometimes *ajakara*, Hindi, *ajgar*, *Python molurus* (Ja.III,484). This powerful constrictor is marked with distinctive irregular brown saddles over yellow or grey and can grow up to 5 metres in length. The Pāli name means ‘goat-eater’ and indeed the Indian Python can grow big enough to kill and swallow goats, calves or small deer. The comment was made that ‘pythons are not poisonous but they are very strong. Any man or animal who comes near they wrap their coils around and crush’ (Ja.VI,507).

Ajjaka. Hoary Basil, *Ocimum canum* (Vin.IV,35). A slender erect herb with a four-angled stem and elliptic leaves covered with fine hairs.

Ajjukanna. A type of tree (Ja.VI,535).

Ajjuna. Sometimes also *kakudha*, Hindi *arjun*, *Terminalia arjuna*. A large tree sometimes attaining a girth of 3.6 metres and a height of 30 metres and commonly found growing on the banks of rivers (Ja.VI,518). It has pale greenish or grey bark, long inclined branches and white flowers. The bark is sometimes boiled in water to make a tonic. After washing his robe the Buddha climbed out of the Nerañjara River by grasping a branch of a *kakudha* tree (Vin.I,28). The *Mahāvastu* gives the name as *kakubha* and describes the tree as being beautiful and having wide-spreading branches (Mv.III,302). The past Buddha Anomadassī attained enlightenment under an *ajjuna* tree (Bv.8,23).

Ajjhohāra. A large and probably fantastic marine creature (Ja.V,462). See **Timi**.

Añjanarukkha. A type of tree (Ja.I,331). The name means ‘black tree’.

Aṭṭhikadali. A type of banana tree (Ja.V,406).

Atimuttaka. Uncertain, but perhaps *Hiptage madablota*. A large woody shrub with showy white flowers (Ja.IV,28; 440). According to the Jātaka it is a type of vine or creeper (Ja.V,422).

Ativisa. Monk’s Hood or Friar’s Hood, *Aconitum palmatum*, *A. ferox*, and or *A. spitacum* (Vin.I,201; IV,35). These hardy perennial plants grow in the

Himalayas between an elevation of 3000 and 5000 metres. They have dark-green glossy leaves, a fleshy spindle-shaped root and purple helmet-shaped flowers that grow in erect clusters. The leaves, stem, flowering tops and particularly the root are poisonous and all have numerous medical uses. In ancient times arrow heads were coated with the poison.

Adda. See **Siṅgivera**.

Adhipāta. See **Kiṭa**.

Anojā. A type of plant with red flowers (Ja.I,9;VI,536).

Andhaka. See **Kiṭa**.

Aparaṇṇa. A general term for raw cereals (Vin.III,50). See **Dhañña**.

Apphoṭā. A type of creeper (Ja.VI,336).

Amarā. Eel, a scaleless, snake-like fish of the order *Synbranchiformes*, of which there are nine species in northern India. The most common and widespread eel in northern India is the Mud Eel, *Monopterus albus*. Growing up to 600 millimetres in length and weighing as much as 1 kilogram, the mud eel is greenish or chestnut brown with black spots and has an elliptical head, small fins and a flat stumpy tail. The mud eel is found in rivers, swamps and rice fields situated near rivers. The Buddha referred to teachers who equivocated when asked a question as 'eel-wrigglers' (D.I,24; M.I,521).

Amba. Mango, Hindi *am*, *Mangifera indica*. A large evergreen tree of which there are about 700 varieties in India and which is cultivated mainly for its delicious fruit. The fruit can be nearly round but are more commonly elongated and turned up slightly at the end and are golden-yellow colour when ripe. The fruit was eaten with relish and it was also made into a drink (Vin.I,246) and when mixed with sugar was taken as a medicine (Ja.II,393). Mango peel was put in curries (Vin.II,109). The colour of monks' and nuns' robes were compared to that of the mango (Th.197). Groves of mango trees were, and indeed still are, found outside many villages in India. People planted such groves to provide fruit and to picnic in during the spring and wandering ascetics often used to reside in them. The monk Meghiya described one such grove thus: 'Truly lovely and delightful is this mango grove; a good place for one wanting to meditate' (Ud.34). Several mango groves are mentioned in the Tipiṭaka; Pāvārika's Mango Grove at Nālandā, Cunda's Mango Grove at Pāvā, the

Grove of Wild Mangoes at Macchikāsaṇḍa and Jivaka's Mango Grove which was outside the east gate of Rājagaha (A.V,263; D.I,47; S.IV,281).

One who wants mangoes will knock them out of the tree by throwing a mango at them (Mil.189). The famous trick where a mango seed is made to apparently sprout, grow leaves, flower and then bear fruit, all within a few minutes, was already being performed by conjurers during the Buddha's time (Ja.IV,324). The previous Buddha Sikhī was enlightened under a white mango tree (D.II,4).

Ambakamaddarī. Eurasian Golden Oriole, *Oriolus oriolus*. A thrush-sized bird, golden yellow with black wings and tail and a black streak through the eye. The bird's Pāli name is probably due to both its ripe-mango colour and the fact that it arrives in northern India in spring just as the mangoes ripen, although in some areas it is resident. The Eurasian golden oriole is arboreal and feeds on fruits, berries and nectar. The Buddha mentioned that its harsh screeching call is not as impressive as that of the domestic fowl (A.I,188).

Ambāṭaka. Hog Plum, Hindi *amra*, *Spondias mangifera* (Th.466). A common medium to large tree with smooth white bark and small white flowers. The yellow ellipsoid plum-sized fruit is unpleasantly astringent but becomes edible just as it ripens. The leaves have a distinct mango-like smell.

Ambuja. See **Maccha**.

Ambusevāla. A type of moss or aquatic plant (Th.113).

Araññabiḷāla. See **Biḷāla**.

Ariṭṭhaka. Soap Nut Tree, Hindi *areetha*, *Sapindus mukorossi*, a large deciduous tree which bears small white flowers. The fruit is ovoid and covered with a soft rusty-coloured flesh and when rubbed with water produces a rich lather which is used as a substitute for soap. *Ariṭṭha* was a type of alcoholic drink although it is not clear if this was made from the soap nut tree (Vin.IV,110).

Alagadda. See **Sappa**.

Alattaka. A red substance women used to dye their feet with (M.II,64; Th.771). This may have been an alternative name for lac but is more likely to have been made from a plant called *paṭala* (Ja.IV,114). See **Lākhā**.

Alābu. Sometimes also *alāpu*, a type of creeper or climber bearing an edible fruit, probably a type of gourd (Dhp.149; M.I,80). The Buddha said that he sometimes wore robes made out of cloth ‘as soft as the down on an *alābu* leaf’ (M.II,7).

Avāka. *Blyxa oryzetorum*. A short, tufted aquatic plant often found growing in rice fields (Ja.III,522).

Asana. Hindi *asan*, *Terminalia tomentosa* (Ja.VI,535). A very common large tree with its bark cracked into oblong segments and with elliptic or sometimes oblong leaves.

Asi. A type of tree which stands tall like a palm tree (Ja.VI,336; 536). As the word *asi* also means ‘sword’ it may be that this tree had sword-shaped or very sharp leaves.

Asoka. Hindi *asok*, *Jonesia asoka* (Ja.V,188). One of India’s most beautiful trees, the Asoka is a small erect evergreen producing bunches of fragrant orange or orange-yellow flowers which gradually turn red. The pulp of the fruit is used as a cure for dysentery.

Assa. Horse, also called *haya* and *turaga*, *Equus caballus*. The horse is a large herbivorous mammal adapted for running and which has been domesticated for at least 5000 years. A thoroughbred was called *assājāniya* (A.I,77; M.I,124), a nag *assakhaluṅka* (A.I,287), a mare *vaḷavā* (M.II,153) and a foal *assapotaka* (Ja.II,288). The finest horses were imported into northern India from Sindh (Dhp.322) and were called *bhojjiha* (Ja.I,180) or *sindhava* (Ja.I,175; II,96; III,287). The Kathiawari, India’s indigenous horse, was probably derived from the cross-breeding of Sindh and Arab horses in the 12th century. Horses were too expensive to be used for ordinary transport and were reserved mainly for royalty, to pull chariots and for cavalry during war. Chariots and cavalry were two of the four branches of the army. The importance of horses in ancient India is suggested by the space given to their care, maintenance and training in the *Arthaśāstra*.

A horse fit for a king was expected to have eight qualities: to have a good stud line; when given food whether green or dried it should eat it carefully and not scatter it about; it will not lay in its own dung; it should not fight with the other horses; it should show itself as it is to its trainer; it is able to carry even heavy loads; when galloping it does not swerve from one side to the other; and it should pull the carriage properly (A.IV,188).

Horses were trained using gentle means, harsh means and a combination of both (A.II,112). This is similar of the *Aśvaśāstra*’s advice that a combination of gentleness, rewards and punishment is the best way of training horses. Training took place in special grounds, and the horses

were penned either in stables or in circular corrals and fed steamed rice (Vin.III,6). We read of the best three-year-old rice fed to a king's Sindh horse (Ja.I,178). A good horse would respond even to the shadow of the whip (A.II,14) and a thoroughbred was expected to be endowed with beauty, stamina, speed (A.I,244) and be finely proportioned (A.I,288). A highly-strung horse would not move when urged on, upset the carriage, kick up its hind legs and break the shafts of the carriage, rear up in the air and pull at the bit (A.IV,190-4).

Ropes and cords were made out of horsehair (A.IV,129; S.II,238) as were sieves (M.I,229), brushes (A.I,208) and bird snares (Ja.V,362), and couches were stuffed with it (Vin.II,170). Being able to judge a good horse was a respected skill and horsemanship was an art taught to princes (A.III,152; 326). The Vedic horse sacrifice (*assamedha*) was still being performed by kings (A.II,42; S.I,76) and fights between stallions were arranged for entertainment (D.I,7). Horses' tails were sometimes plaited (D.I,105). The Tipiṭaka mentions the castration of animals and the men who performed this job, although there is no specific mention of this being done to stallions (Ja.IV,364; M.I,383). The Buddha urged his disciples to imitate the well-trained good horse: 'Like a well-bred horse touched by the whip, be eager and swift' (Dhp.144). Asoka's 5th Pillar Edict mentions that branding horses and cattle was banned on certain full-moon days. According to the Jātaka, the Bodhisatta was once reborn as a Sindh horse (Ja.I,178).

Assakaṇṇa. See **Sāla**.

Assatara. Mule, Hindi *astar*, the hybrid of a horse and a donkey, combining the size of the first and the endurance of the second (A.I,229; S.II,241). Mules were used as pack animals and to draw carts and chariots (S.I,211). The best mules were bred in Kamboja in north-west India (Ja.IV,464). The ancient Indians knew that mules were sterile (M.II,153). The Buddha once said: 'Well trained mules are excellent as are thoroughbred Sindh horses and noble tusked elephants; but better still is he who has trained himself' (Dhp.322).

Assattha. Bodhi Tree, Hindi *pīpal*, *Ficus religiosa*. This variety of fig has large spreading boughs with leaves ending in a characteristic pointed tip. The *assattha* is semi-parasitic, sometimes growing up against other trees and stunting them (S.V,96). It can also grow on the walls of buildings causing them great damage. Like other figs, it grows from a tiny seed into a huge tree (S.V,96). It was said that a mother's heart beats on seeing her son 'as the tender leaves of the *assattha* tremble in the breeze' (Ja.V,328; VI,548).

The *assattha* was considered sacred in India centuries before the Buddha and is represented in seals from Mohenjodaro dating from before 1000 BCE. The Buddha stated that he had attained enlightenment at the foot of an *assattha* tree (D.II,4) and the actual one he was sitting under at the time was sometimes called 'The Tree of Knowledge' (*Jñānadruma*, Bc.13,65). This tree is referred to in the four Nikāyas as 'The Tree of Awakening' (*Bodhirukkha*) although it is only mentioned twice (D.II,4; Ud,1 repeated at Vin.I,1) in the earliest part of the Tipiṭaka. Before the Buddha's enlightenment, the area around the Bodhi Tree was covered with silvery sand without a blade of grass growing on it and all the surrounding trees and flowering shrubs were bending as if in homage towards it (Ja.IV,233).

According to the *Nidānakathā*, the Buddha spent his second week at Uruvelā (i.e. Bodhi Gaya) gazing at the Bodhi Tree out of gratitude for the shelter it had offered him (Ja.I,77). The same text adds that as the Buddha sat meditating beneath the Bodhi Tree, *aṅkura* the colour of red coral sprinkled down on him as if they were an offering (Ja.I,75). *Aṅkura* usually means a shoot but here it must refer to the glossy crimson sheathing stipules that are cast off as the new leaves of Bodhi trees develop.

In the early centuries of Buddhism, the *assattha* tree became a symbol of the Buddha and in the sculptures of both Bharhut and Sanchi he is depicted as such. In the *Mahāvastu*, he is actually given the epitaph 'Great Tree' (*Mahādruma*, Mv.II,280). A branch of the Bodhi Tree was brought to Sri Lanka by the nun Saṅghamittā, the daughter of King Asoka, in the 2nd century BCE and is believed to still grow in Anurādhapura. A distant ancestor of the original Bodhi Tree grows behind the Mahābodhi Temple at Bodhi Gaya.

Ahicchattaka. Mushrooms and toadstools, sometimes also *ahicchattaka*, fungi of the classes *Hymenomycetes* and *Gasteromycetes*. The Pāli names mean 'snake umbrellas' (Ja.II,95) as does the Hindi for mushrooms, *sarpchatr*. There are over 50 species of edible mushrooms in India, some of them growing in the north. They were, according to the legend, the first plants to appear after the formation of the earth (D.III,87). See **Bhūmipappatāka**.

Ā

Ākucca. A type of lizard (Ja.VI,538).

Ākhu. See **Mūsika**.

Āṭa. A bird described in the commentaries as *dabbīmukha*, ‘spoon-mouthed’ (Ja.VI,539). If this is correct it must refer to the Eurasian Spoonbill, Hindi *dabil*, *Platalea leucorodia*, a large bird with a long neck and legs, pure white plumage and a distinctive spoon-shaped bill. The spoonbill is seen either individually or in flocks feeding in marshes, mudflats and estuaries.

Ānandamaccha. A large and probably fantastic marine creature. See **Timi**.

Ābhujī. A type of tree (Ja.V,195).

Āmalaka. Indian Gooseberry, *Emblica officinalis*, Hindi *amal* (Ja.IV,363; VI,529; Vin.I, 201; 278; II149). A medium-sized tree with greenish-grey bark, yellow flowers and a pale-green sour fruit with a large hard fluted seed. Together with *harītaka* and *vibhītaka* this fruit is one of the *triphala* or ‘three fruits’, long credited in traditional Indian medicine with powerful curative properties. It contains high concentrations of gallic acid and is rich in vitamin A, C and iron and either fresh or dried is taken for diarrhea and dyspepsia. It is also used in tonics or eaten dried, pickled or made into a tasty marmalade. Wood chips from the tree are used to clarify muddy water and wood cutters and honey gatherers working in the forest often take the fruit to suppress their thirst.

Āli. See **Maccha**.

Ālu. A type of plant with a tuberous root (Ja.IV,371; 373; VI,578).

Āluka. This is used generally to mean a tuber, and may have also been a name for *Dioscorea alata* (Ap.17). A stout climber commonly cultivated for its large edible tuber. See **Rukkha**.

Āsītika. Possibly Oriya *arsi*, *Entada scandens* (M.I,81). A huge woody climber with cream-coloured flowers and large pods. The central stem of

this climber can attain a girth of 1.5 metres and has pronounced flanged segments sometimes with cork-screw-like projections. The Buddha said that when he was practising austerities before his enlightenment he became so thin that his limbs looked like a *āsītika* stem (M.I,245).

I

Ikka. See **Acchaka.**

Ikkāsa. See **Jatu.**

Indagopaka. Red Velvet Mite, Hindi *indra*. An arthropod of the family Trombidiidae (Ja.IV,258; VI,184; 497; Th.1063) of which several species live in northern India. The Pāli name for these small creatures means 'Indra's herdsman' and was probably related to the fact that they emerge from the ground during the rainy season (Indra was the Brahminical god associated with thunder and storms). These mites have a bright-red rounded body with a velvety appearance and are parasitic on spiders and insects. We read of a monk who made a round hut out of red clay which looked 'beautiful, lovely and pleasing like a little red velvet mite' (Vin.III,42). A type of cloth made in Gandhāra and used to upholster chariots was said to be the colour of these mites (Ja.VI,500).

Indavāruṇīkarukkha. Bitter Apple, Hindi *indrāyan*, *Citrullus colocynthis* (Ja.IV,8). An attractive grey-coloured tree covered with small rough hairs and with green and white flowers. The fruit is bitter, acidic and poisonous if taken in large amounts.

Indasāla. A type of tree (Ja.IV,92). According to tradition, a cave in the mountains around Rājagaha where the Buddha used to stay was so named because one of these trees grew at its entrance (D.II,263).

Indivara. See **Uppala.**

Isikā. See **Naḷa.**

Isimugga. Either *Celosia argentea* or *C. cristata*, both plants being very similar (Ap.16;193). These erect herbs have alternate leaves, pink or white flowers, shining black seeds and grow up to 90 centimetres high. Their Pāli name means 'sage beans'.

Issa. A type of deer. See **Miga.**

U

Ukkaṇṇaka. See **Vitacchikā**.

Ukkapiṇḍaka. Uncertain. The name means something like ‘finding food in a house’. Perhaps it is a general term for animals considered pests or vermin, what we might call household pests. Once some monks put food out to dry and it was eaten by these creatures (Vin.I,211).

Ukkusa. A type of raptor (Ja.IV,291; 397), possibly another name for the *kurara*. According to the Jātaka, the Bodhisatta was once reborn as one of these birds (Ja.IV.392).

Uccāliṅga. A type of arthropod or caterpillar. It is mentioned together with the scorpion, the centipede and the spider, as an example of a multi-legged animal (Ja.II,146). It is also said to be one of the things that can cause an erection in males (Ja.II,146; Vin.III,52; 112).

The *Kāma Sūtra* mentions a procedure men used to enlarge their penis. The soft but irritating bristles of a particular caterpillar were rubbed on the organ and the resulting swelling would become permanent. There may be some connection between this caterpillar and the *uccāliṅga*.

Ucchu. Sugar Cane, Hindi *ikshu*, a tall perennial grass with sharp-edged leaves and a purplish segmented stem from which a sweet juice can be extracted (Vin.III,59). Many recent hybrid varieties of sugar cane grow in India today. *Carakasamhitā* mentions two types of sugar cane, *Suśrutasaṃhitā* mentions twelve while only one type is specifically named in the Tipiṭaka, *ucchaganṭhikā*. (Ja.I,339; VI,114). One type grown in northern India since ancient times and was probably known to the Buddha’s contemporaries is *Saccharum barberi*.

To make sugar, cane stems were crushed in a mill and the juice reduced by boiling (Ja.I,339). We read of the creaking sound made by the sugar mill (Bv.2,168). It was said of a particularly oppressive king that he ‘crushed the people like sugar cane in a press’ (Ja.II,240). Three by-products of the juice are mentioned; *phāṇita*, *gūla* and *sakkharā* (Ja.I,50). The first is molasses, the second jaggery and the third crystallized sugar. Molasses was sometimes mixed with water and drunk (Ja.III,372; Vin.II,177), and when mixed with hot water was taken as a medicine (S.I,175). Jaggery was rolled into balls (*gūlapiṇḍa*, Vin.IV,112) and crystallized sugar was referred to as granulated or powdered sugar

(*sakkharā-cuṅṅā*, Ja.IV,17). The Sanskrit *Saddharmasmṛtyupasthāna Sūtra** describes the whole process thus: ‘...the sugarcane juice is put in a vessel and boiled over a fire. During the first stage it is separated from impurities and is called *phāṇita*. At the second boiling, it becomes thicker (or more heavy) and is called *guda*. When boiled the third time it becomes white and is called *sarkarā*.’ During the first stage of the processing flour and ash were added (Vin.I,210), the flour probably to thicken it and the ash as a clarificant, something that is still done in village sugar production.

Rice porridge with ghee and sweetened with sugar was a popular food (Ja.IV,39), and there was a type of confectionary called sugar cake (*sugūla*, Ja.VI,524). An alcoholic beverage was made from sugar cane juice (Ja.IV,161; Vin.IV,109). There is a reference to a caravan transporting 500 jars of sugar (Vin.I,224). Ripe sugar cane could be struck by a disease called *mañjithika* (A.IV,279). Sugar cane was usually propagated from a segment of stem but also from seeds (A.I,32).

Uṇṇā. Wool, sometimes *unna*, the hair of sheep, goats or camels which can be spun into thread and then woven into cloth (D.II,188; Vin.II,174) or made into felt (Vin.I,315). Woollen cloths and blankets were necessary to keep off the cold of the Indian winter. Monks were not allowed to wear certain types of woollen clothes (Vin.II,108) nor sandals made out of wool (Vin.I,190). Despite being soiled by children and chewed by rodents, a good woollen rug could last for five or six years (Vin.III,227). Young women were expected to be good at spinning and weaving wool (A.III,37). Knitting was unknown in ancient India.

Udakakāka. Both the Great Cormorant, *Phalacrocorax carbo*, and the Little Cormorant *P. niger*. The Pāḷi name means ‘water crow’ and the two birds are called *pan kowwa* in Hindi which has the same meaning (Ja.II,441). Both these cormorants are black with a small patch of white on the throat. The main difference between them is their size, the first being about as big as a domestic duck and the second about half that size. Also, the great cormorant has a yellow beak while the little cormorant’s is black. Both birds are commonly seen singly or in small flocks on lakes where they hunt fish by diving and chasing them underwater. According to the Jātaka, the Bodhisatta was once reborn as a cormorant (Ja.II,149).

Udakasappa. Checkered Keelback, sometimes also *udakāsivisa*. Hindi *panika sanp*, *Xenochrophis piscator* (Ja.II,238; III,275). A snake with an oval head, slit-like nostrils and five rows of black spots on its yellowish brown-coloured body. It grows up to 1.48 metres long, the tail making up to one

* *Zheng fa nian chu jing* 《正法念处经》, Taisho edition of the Chinese Tripiṭaka, T17n712,p.17. The name is a re-construction of the Sūtra’s original Sanskrit name.

fourth of its total length. The checkered keelback is India's most common freshwater snake and frequents lakes, ponds, river banks and paddy fields where it feeds almost exclusively on frogs and fish. It is also an aggressive snake, striking rapidly, with great determination and holding on to its prey tenaciously.

Udakāsivisa. See **Udakasappa.**

Udumbara. Cluster Fig, Hindi *dumbar*, *Ficus glomerata*. A large tree with a buttressed trunk, dark-green ovate leaves and which produces reddish mildly sweet figs that grow in clusters on short branches. A spendthrift or a wastrel was called an 'udumbara eater', i.e. one who shakes all the figs out of the tree and then only eats a few (A.IV,283). There was a grove of these trees near the Bamboo Grove at Rājagaha where wandering ascetics used to stay and where the Buddha had a discussion with the ascetic Nigrodha (D.III,36).

Like several other species of Indian figs, this one was an object of curiosity to the ancient Indians because it appeared to produce fruit without first bearing flowers. The Buddha said that one cannot find an essence in existence any more than one can find a flower in a cluster fig (Sn.5; Vv.50,16). The *Mahāvastu* says: 'It is no easier to win sight of the Buddha, great in glory, empathy, compassion and beneficence, than it is to see a flower in a cluster fig' (Mv.I,270). In fact, the fruit of the cluster fig itself is the flower. The head of the flower turns inward to produce a vase-like fleshy casing inside which are numerous tiny flowers. The previous Buddha Koṇāgamana was enlightened under a cluster fig tree (D.II,4).

Udda. Otter, also called *jalamajjāra* 'water cat' and *uddarakā*, Hindi *udra* (Ja.III,52; V,416). Of the three species of otter found in northern India the most common is the Smooth-Coated Otter, Hindi *ubdilao*, *Lutrogale perspicillata*. This creature has a long graceful body with short legs and a beautiful smooth, shiny, chocolate-brown coat with a lighter underside. Otters live in rivers and streams and feed on fish, crustaceans, frogs and birds. Slippers were sometimes made out of otter skin (Vin.I,186). One of the most famous Jātaka stories concerns two otters who ask a jackal to arbitrate a disagreement between them (Ja.III,333).

Uddarakā. See **Udda.**

Uddāla. Hairy Sterculia, *Sterculia villosa*, sometimes also *uddalāka*, Hindi *udal*, (Ja.IV,301; V,199; VI,269). A large tree with grey bark, large leaf scars on the branches and with a red or crimson flower. This tree is usually found growing on the cool side of hills. The crushed root is administered

as a cure of dysentery and the bark is believed to have contraceptive properties.

Uddhumāyikā. The Indian Bull Frog, *Hoplobatrachus tigerinus* (M.I,143). The Pāli name means 'one that swells up'. This large common frog has a pointed snout, smooth olive or brown skin with distinct longitudinal glandular folds on the back and sides. During the breeding season the male's external vocal sacs turn bright blue and are inflated to a great size, probably the origin of the animal's Pāli name.

Undura. Rat, sometimes *undūra*, Hindi *indur*. The rat is a small mammal with an elongated body, a moderately pointed snout, approximately equal-length legs and a long sparsely-haired tail. The two most common species of rat in India are the House Rat, *Rattus rattus*, and the Brown or Norwegian Rat, *R. norvegicus* (Ja.III,123). Both rats live in houses and barns but also in fields, jungles and along the banks of waterways. They chewed holes in clothes (Vin.I,109) and rugs (Vin.III,227) and sometimes overran monasteries (Vin.I,209).

Unnaka. A perfume made from the extract of a particular plant (Ja.VI,537).

Upacikā. Termite. Sometimes called white ants, termites are small soft-bodied insects of the order *Isoptera* that eat wood and live in large colonies (M.I,306; Vin.I,284; II,113). The Pāli name means 'mound builder'. Snakes and iguanas are often described as living in holes in termite mounds. Winged termites, called *makkhikā*, sometimes swarm, particularly after rain (Ja.I,488). At such times lizards and other animals gorge themselves on them, even people used to eat them with vinegar and sugar (Ja.I,480-81). Termites move from one place to another only after having built a tunnel in which to conceal themselves (Mil.392). The Buddha said that a diligent layman's wealth will grow like a termite's mound (D.III,188).

Upayānaka. An aquatic animal, perhaps a type of crab (Ja.VI,530).

Uparibhaddaka. A type of tree (Ja.VI,269).

Uparopa. A type of plant, sometimes *uparopaha* (Ja.II,345; IV.359; Vin.II,154).

Uppala. Blue Water Lily, sometimes also *indīvara*, *Nymphaea stellata* (Vv.45,5). The rhizome of this plant grows in the mud of ponds and swamps and its rounded leaves float on the surface. The large flowers have

numerous spear-shaped petals spiralling out from the bright yellow stamen and are a beautiful deep blue but sometimes crimson, white or pink. Their perfume was said to last for a week (Ja.VI,536) and a starry night sky is compared to their colour (J.V,92). The eyes of a beautiful woman were compared with a water lily bud (Thi.382). Inhaling the perfume of the water lily was believed to have a curative effect (Vin.I,279). Very similar to the blue water lily is the Small White Indian Water Lily, *N. esculenta*, with its white or sometimes yellow flower (Vv.47,1). Water lilies are often incorrectly called and confused with the lotus. See **Sogandhika**.

Uppāṭaka. Fleas are small rust-coloured wingless insects of the order *Siphonaptera*. They feed on blood and have enlarged muscular hind legs adapted for leaping. Fleas can infest human habitation, hiding in bedding and clothing. In one place we read of a blanket being covered with fleas (S.I,170). In the famous Sasa Jātaka the hare shook the fleas from its fur before leaping into the fire (Ja.III,55).

Ummāpuppha. See **Khoma**.

Ulūka. Brown Fish Owl, sometimes also *ulūkasakuṇa*, Hindi *ullu*, *Ketupa zeylonensis* (Ja.II,353; V,120; VI,500), large brown bird with a lighter breast covered with vertical black streaks, prominent tufts or 'horns' on its head and large yellow staring eyes. The fish owl favours thick jungle near water and feeds on crabs, fish, frogs, mammals and birds, and like all owls they are silent and stealth creatures (A.V,289). The owl was considered the king of birds (Ja.II,208) and they have serious or sour faces. Some ascetics made coats out of owl's wings or feathers (A.I,241; D.I,167), and sandals were made out of their skins (Vin.I,186). Owls could be observed sitting on the branch of a tree waiting for prey and giving the appearance that they were 'meditating, contemplating, ruminating, speculating' (M.I,334). When owls appear during the day they are mobbed by crows (Ja.II,208). See **Kosika**.

Usīra. See **Biraṇa**.

Uhuṅkara. Perhaps a generic word for owls or a the name of a particular type of owl (J.VI,538). See **Kosika**.

Ū

Ūkā. Head Lice, insects of the order *Anoplura*. Head lice are a small flattened blood-sucking insect found in human hair. There are many references in the Tipiṭaka to people asking others to pick the lice or their eggs out of their hair (Ja.I,453; II,324; III,393; V,298). One of the reasons Buddhist monks and nuns shaved their heads was probably so they could not get and therefore did not have to kill head lice. One ancient Indian system of measurement took as its basic unit the louse's egg, *likkhā*. Seven eggs equal the length of one louse.

E

Eṇi. The Blackbuck doe. According to Pāṇini *eṇi* is a term for a female deer. One of the 32 special characteristics of a Mahāpurisa is that he has legs like an *eṇi* (D.III,143). See **Miga**.

Eṇeyya. Sometimes also *eṇi*, *eṇeyyaka* or *eṇimiga*. Uncertain but perhaps another name for the Blackbuck doe (A.I,48; D.III,157; J.V,416; Thi.1135). See **Miga**.

Eraka. A type of plant (Ja.IV,88).

Eragu. A type of coarse grass which could be used for making coverings (Vin.I,196).

Eraṇḍa. Castor Oil Tree, sometimes *elaṇḍa*, Hindi *erandi*, *Ricinus communis* (M.II,152), a tall annual bush with large blue-green leaves and which produces spiky pods containing seeds from which a colourless oil can be extracted. Castor oil is used as a lubricant, in lamps and the oil extracted from the seeds was used as a medicine (Vin.III,250). The castor oil tree was considered the lowest of all trees (Ja.II,440). According to the Jātaka, the Bodhisatta was sometimes reborn as a spirit in a castor oil tree (Ja.I,423; II,440).

Elaṇḍa. A type of plant (M.I,124). It is described as inhibiting the growth of sal trees so it may have been a type of vine or creeper.

Elambaraka. A type of creeper or vine. The perfume of the flower would last for seven days (Ja.VI,536).

Elāluka. See **Kakkārika**.

Eḷaka. Domestic Sheep, sometimes *elaḥā*, *elakā* or *elikā* (A.I,252; D.I,9 Ja.I,166; III,480; S.II,228), hollow-horned ruminants of the order *Ovis*, of which several species and breeds are found in northern India. Ewes were called *uraṇi* (Ja.V,241) and rams *meṇḍa* or *urabbha*.

Sheep were known for their long fleece which was used to make cloth and carpets (S.II,228; M.I,228). Mutton must have been eaten too because there is mention of sheep butchers (M.I,343; S.II,256). Bows were sometimes made out of rams' horns (Ja.II,88; V,130; VI,68). The Buddha

considered sheep to be gentle harmless creatures, like cows (Sn.309). A group of monks who spent the three months of the rainy season without doing any spiritual practice other than maintaining strict silence were rebuked by the Buddha as being like dumb sheep (Vin.I,159). In the Jātaka, there is a story of a proud Brahmin who was flattered when a ram lowered its head to him only to find that it butted him rather than paid him reverence. See **Uṇṇa**.

Eḷagalā. A type of plant (S.III,6).

O

Ojā. See **Jatu** and **Rukkha**.

Oṭṭha. Camel, Hindi *oont*, *Camelus dromedarius* (Vin.III,51). A sturdy ungainly animal with a long curving neck and a humped back that thrives in dry and arid habitats. Camels were used for transportation and also for their wool, milk, meat and hides and were probably introduced from Persia centuries before the Buddha. The Buddha said that when practising austerities before his enlightenment, the dry and calloused skin on his buttocks came to resemble a camel's hoof (M.I,245). Pāṇini mentions bags made out of camel wool and containers made from their leather and intestines. The earliest depictions of camels in Indian art are on the gateway of the great Buddhist stūpa at Sanchi.

K

Kakaṅṭaka. Common Garden Lizard, sometimes *kakaṅṭa*, Hindi *kirkantio*, *Calotes versicolour* (Ja.I,487). A common medium-sized lizard, brown or grey in colour, with an oval head and a laterally compressed body. Males have large cheek pouches and a row of lance-shaped scales from the nape of the head to the end of the body. The common garden lizard is largely arboreal, favouring bushes and undergrowth and quickly moves to the far side of the branch it is resting on when observed. During the breeding season the male's head and forelegs become bright scarlet and it makes an unusual bobbing movement to attract females and threaten rival males (Ja.I,442).

Kakuṭa. A general term for doves, Hindi *fakhta*, birds of the Order *Columbiformes*, of which there are five species in northern India. The mythological female creatures called *accharā*, Sanskrit *apsarā*, were believed to have legs like doves. After becoming a monk, the Buddha's half-brother Nanda could not stop thinking of his former girlfriend. The Buddha transported him to one of the heaven realms and showed him the *accharā* 'with feet like doves' whose beauty made the girlfriend look, by comparison, 'like a mutilated monkey' (Ud.22).

Kakudha. See **Ajjuna**.

Kakkaṭa. Barking Deer, Hindi *kakar*, *Muntiacu muntjak* (Ja.VI,538). This small deer has a glossy brown coat, forelimbs longer than the hind limbs and short antlers curved inwards at the end. The barking deer prefers thick forest and makes a sharp barking call when alarmed. The Pāli name is probably onomatopoeic of this call.

Kakkaṭaka. See **Kulira**.

Kakkārika. Cucumber, sometimes *kakkārī*, Hindi *kakri*, *Cucumis sativus* (Vin.III,59; Vv.3 3,28), a creeper producing a long rounded fruit with dark-green skin and succulent light-green flesh and which is usually eaten raw. Other varieties of cucumber were *elāluka* (Ja.I,205;V,37;Vv.33,28) and *tipusa* (Ja.V,37). The cucumber is probably indigenous to India.

Kakkāru. White Gourd Melon, *Benincasa cerifera* (Ja.VI,536). A large climber with soft hairs all over and which produces oblong rounded fruit

which is eaten cooked or crystallized in sugar and eaten as a sweetmeat. Its fruit could be as big as a large clay pot (Ja.VI,536).

Kaṅka. A general term for cranes and herons, Bengali and Hindi *kank* (M.I,364), of which there are several dozen species in India. The *Mahābhārata* mentions *kaṅka* circling overhead with vultures and crows and prowling around the battlefield together with jackals. As neither herons nor cranes are carrion-eaters, the name *kaṅka* must have included the Greater Adjutant Stork, *Leptoptilos dubius*. This large, sad-looking bird has a black back and wings, a dirty-white breast, a naked neck and head and a huge yellow wedge-shaped bill. Hanging from the neck is a long naked red pouch. With its measured gait, the bird is often seen alone or in pairs around garbage dumps in cities and villages or at the edge of lakes, where it eats frogs, fish or large insects. The feathers of cranes and herons were used to make flights for arrows (Ja.V,475; M.I,429).

Kaṅgu. Millet, A hardy grass cultivated for its edible seeds. Several varieties of millet grow in and are probably indigenous to northern India, common ones being *sāmāka*, Hindi *sawan*; *Panicum indicum* (Sn.239); *Echinochloa colona*, Hindi *sawa*; *Paspalum scrobiculatum*, Hindi *kodo*; and *Setaria pumila*, Hindi *korali*. Millet is one of the seven kinds of grain sometimes mentioned in the Tipiṭaka (Ja.VI,581; Vin.IV,264). See **Piyaṅgu**.

Kaccikāra. *Caesalpinia digyna* (Ja.V.420; VI,535). A large many-branched evergreen shrub covered with thorns. It bears beautiful pale-yellow flowers.

Kacchaka. A type of tree which the Buddha names along with the *assattha*, *nigrodha*, *pilakkha*, *udumbara* and the *kapitthana* as having ‘tiny seeds, huge bodies and growing around other trees so that they bend, twist and split’ (S.V,96; Vin.IV,34).

Kacchapa. Turtle, sometimes also *kuma* or *kumma*, reptiles of the order *Chelonia*. Turtles live in marine or freshwater habitats while tortoises, sometimes called land turtles, are terrestrial. Four species of marine turtles swim in Indian waters, the most common being the Hawksbill Turtle, Hindi *samudra kachakra*, *Eretmochelys imbricata*. The Buddha was probably referring to this turtle in his well-known statement about the rarity of being born human and of coming into contact with the Dhamma:

‘Monks, suppose this great earth were covered with water and a man were to throw a yoke in it and blown by the wind it were to drift north, south, east and west. Suppose also that once every hundred

years a blind turtle were to surface. What do you think? What are the chances that the blind turtle were to put its head through the yoke?' 'It is very unlikely, Lord.' 'Monks, it is just as unlikely that one will be reborn as a human, just as unlikely that a Tathāgata should appear in the world, just as unlikely that the Dhamma should be taught to the world.' (S.V,456-7)

Freshwater turtles are mentioned in the Tipiṭaka although it is not possible to identify any of the several species that inhabit the rivers and ponds of northern India. They were described as having four legs, a neck like a pole and a body round like a banyan tree (Ja.II,152). Freshwater turtles were eaten and we read of those living in lakes being speared with harpoons (S.II,227). Some of the behaviour of turtles that were observed included floating on the surface of the water but on seeing someone quickly submerging, coming out of the water to bask in the sun and digging burrows in the banks of rivers. If a turtle was on the bank of a river and a predator like a jackal approached, it would withdraw into its shell and remain still (S.IV,177-8; Mil.370-2). They were believed to be able to tell when there was going to be a drought (Ja.II,80) and at such times would burrow into the mud trying to keep wet (Ja.I,331). A thing or event that was impossible was referred to as 'a turtle's hair' (Ja.III,477). The Buddha said the meditative monk should in some ways imitate the land turtle: 'Just as the turtle withdraws its limbs into its shell, a monk should withdraw his mind and thoughts' (S.I,7). See **Cittacūlā Kacchapa** and **Gajakumbha**.

Kacchū. See **Vitacchikā**.

Kañcaka. Indian Elm, Hindi *kanju*, *Holoptelea integrifolia* (Ja.VI,536). A deciduous tree growing to a great height with ovate leaves, smooth ash-grey trunk and small greenish-yellow flowers which grow in dense clusters. The strong lustrous wood of the Indian elm is commonly used to make ploughs and carts.

Kaṭukarohiṇī. Hellebore, Hindi *katuka*, *Picrorhiza kurroa*. This small herb has elongated leaves with serrated edges and small purple flowers and grows between 3000 and 5000 metres. in the Himalayas. A fragrant but bitter oil is extracted from the rhizome of the plant. It was said that evil deeds have results as bitter as hellebore (S.I,57). The Buddha recommended the hellebore as a medicine (Vin.I,201). It also was, and still is, used to make incense and perfume (Ja.II,416).

Kaṭerukkha. A type of tree (Ja.VI,536).

Kaṭeruha. *Scirpus grossus*, Hindi *kesari*, (Ja.VI,537). A large sedge plant with long leaves and large black tubers. It is commonly found growing in about 0.3 metre of water and its leaves are made into rough matting. The tuber can also be eaten.

Kaṭṭhaka. See **Naḷa**. *Scirpus grossus*

Kaṇa. See **Taṇḍula**.

Kaṇavīra. Indian Oleander, sometimes *kaṇavera* Hindi *kaner*, *Nerium indicum* (Ja.III,62; VI,406). A attractive erect shrub with rod-like branches and narrow leaves tapering at each end. The flowers are either pink or white. In Uttar Pradesh the Indian oleander is often found growing in dry river beds.

Kaṇikā. Sometimes *kaṇṇikā*, *Premna integrifolia* (Ap.17). A small tree with a thorny trunk and a beautiful white or green flower. The wood of this tree is hard, even-grained and pleasantly-scented.

Kaṇikāra. Sometimes also *kannikāra*, Hindi *kanak champa*, *Pterospermum acerifolium* (A.V,61; Bv.27,19; D.II,111; Ja.V,295; IV,535; M.II,14), a tall majestic deciduous tree with rounded leaves, green on top and greyish-white beneath and a large yellowish-orange coloured sweet-smelling flower. Monks' robes were described as being as yellow as the *kanikāra* flower (Ja.II,25). In the Jātaka there is a story in which a young woman tells her mother that if she dies 'collect my bones, burn them, raise a monument and plant a *kanikāra* tree there. Then, when it breaks into blossom in the spring, when the winter is over, you will remember me, my mother, and say "Such was the beauty of my daughter" ' (Ja.V,302). The Chinese pilgrim Xuanzang mentioned that all the roads around Rājagaha were lined with *kanikāra* trees and in the spring the forests would become golden-coloured with their blossoms.

Kaṇṭakalatā. *Crataeva horrida* (Ja.V,175). A shrub that climbs by means of hook-like thorns and which has ovate leaves and white or sometimes pink flowers. The Pāḷi name means 'thorn creeper'.

Kaṇṭakuraṇḍa. *Solanum xanthocarpum*. A diffuse herb with bright green ovate oblong leaves and deep-blue flowers. The plant is covered with straight, yellow-coloured, very sharp spines and is often found growing on waste land (Ja.II,66).

Kaṇṇaka. A type of animal (Ja.V,406). The name means 'one with ears' and thus may refer to the rabbit or perhaps the caracal. See **Biḷārā Sasakaṇṇikā**.

Kaṇhasappa. Sometimes *kālasappa*, meaning 'black snake' both terms are as much descriptions as names and refer to the King Cobra, Hindi *kala*, *Ophiophagus hannah* (Ja.I,336; III,269; V,446). The king cobra has a blackish-brown body with lighter bands around it, a creamy or orange throat and can grow up to 5 metres long. It is an aggressive snake, sometimes attacking without provocation and when biting it holds on tenaciously, injecting poison into the victim with a chewing motion of the jaws. It prefers thick jungle and feeds exclusively on other snakes. The king cobra is described as having a hood (Ja.III,347). The Buddha said that king cobras are dirty and odorous, terrifying and frightful and that they always betray their friends (A.III,260-1). See **Nāga** and **Sappa**.

Katamāya. A type of animal (Ja.VI,538).

Katthu. See **Soṇa**.

Kadamba. Hindi *kadam*, *Anthocephalus cadamba* (Ja.VI,535), a large straight tree with a simple leaf and a yellow flower which hangs down on drooping branches. The fruit, which is extremely sour, is round and covered with a whitish down. The *kadamba* has nearly disappeared in the wild and is now found mainly in gardens. Wine was flavoured with *kadamba* flowers.

Kadalimiga. Sometimes *kadalimiga* and *kādalimiga*. A type of deer (D.I,7; II,187; Ja.V,406; VI,277).

Kadali. Banana Tree, Hindi *kadal*, *Musa paradisiacal*. A perennial tree with a stem consisting of long stiff leaf sheaths rolled around each other and large bright green paddle-like leaves. The fruits, which grow in large bunches are oblong, slightly curved, yellow when ripe, sweet and edible. After it fruits, the banana tree dies away (A.II,73; M.I,233; S.I,154; II,241). When unrolled, the trunk is found to be porous and empty (S.III,141). The bud of the flower is compared with the colour of teeth (Thi.260). Banana leaves, which resemble a large paddle or banner (Ja.V,195), were used as plates as they still are today (Ja.V,4). See **Moca**.

Kanda. The root of a plant which could be eaten and which was long and pointed like a tusk (Ja.I,273; IV,373; VI,516).

Kandamūlaphala. Probably the tuber of either the *kanda* or the *kandala* (D.I,101).

Kandala. Sometimes also *kandala*, *Amorphophallus campanulatus* (Ja.IV,442). A stout herb which bears red berries on long spikes. The large tuber of this plant is in the shape of a depressed hemisphere and is eaten.

Kapi. A general term for monkeys, sometimes also *makkāṭa* (Ja.II,269; III,355; V,68), primates of the superfamily *Cercopithecidae*. The various words for monkey in the Tipiṭaka seem to be used loosely and interchangeably as is suggested by the mention of a large black-faced monkey, a clear reference to the Hanuman Langur, and a small red-faced monkey, a reference to the Rhesus Macaque. In both cases the word *makkāṭa* is used (Ja.II,445). However, many of the numerous stories about monkeys in the Jātakas would seem to refer mainly to the macaque because this monkey would have been more familiar to most people and because of its more human-like appearance and often amusing antics.

Monkeys pull faces and threaten people (Ja.II,70) and while moving through the forest they grab a branch and let go of it only to grab another (S.II,95; Sn.791). Hunters used to go into the forests of the Himalayan foothills and set traps of sticky pitch to catch them. The more curious monkeys would touch the pitch, get stuck and while trying to free one paw would get their other paws stuck. The hunters would then kill them, put the carcass on a spit and cook them over a fire (S.V,148). Mahākassapa said that a monk who wears rag robes and yet is conceited, is like a monkey wrapped in a lion's skin (Th.1080). Street entertainers had monkeys which were trained to play with snakes and to do tricks (Ja.III,198). In the Jātaka, monkeys are depicted as having the best and worst human traits and attitudes. According to the Jātaka, the Bodhisatta was often reborn as a monkey (e.g. Ja.III,355). See **Sākhāmiga**, **Sākhāssita** and **Vānara**.

Kapiñjala. Grey Francolin, sometimes *kapiñjara*, also *vattaka*, *Francolinus pondicerianus* (Ja.I,212; VI,538; Vin.III,48). About half the size of the domestic chicken, this bird has a blotched-chestnut back, wings and tail, a lighter-coloured breast and a rufous throat circumscribed by a black line. The sexes are the same except that the male has spurs on its legs. The grey francolin favours dry scrub and grassland and feeds on insects and seeds. When disturbed it flies off with a loud whirling sound. It is also a fast runner. Hunters would imitate the francolin's call to attract them and then catch them with nets (Ja.I,208). The Buddha said that too much or too little exertion could be detrimental to concentration, just as holding a francolin too tightly would kill it or holding it too loosely would allow it to fly

through one's fingers (M.III,159). The *Grhya Sūtra* says that feeding a baby boy francolin flesh will impart to him the bird's plump and contented-looking appearance. The *Jātaka* says that the reason why francolins are plump is because their minds are content and still, because they do not stray far from home and because they maintain themselves with whatever food they get (Ja.III,313). The *Nidānakathā* mentions monasteries being decorated with rows of geese and francolins, probably painted or moulded in plaster (Ja.I,92).

Kapittha. Wood-Apple Tree, sometimes *kapittha*, *kaviṭṭha* and *kapitthana*, Hindi *kabith*, *Feronia elephantum* (Ja.V,38; VI,529; Vin.IV,35), a medium-sized deciduous tree with spiny branches and a large, globular, greyish-coloured, hard woody fruit containing numerous seeds embedded in an aromatic pulp. The pulp has an acidic taste and is used to make chutneys and to acidify curd, and the gum from the tree is used to treat diarrhea. The Buddha mentioned the wood apple along with the *assattha*, *nigrodha*, *pilakkha*, *udumbara* and the *kacchaka* as having 'tiny seeds, huge bodies and growing around other trees so that they bend, twist and split' (S.V,96). In fact, although the wood apple often grows up on other trees it never actually kills them. One who wants wood apples will knock them out of the tree by throwing a wood apple at them (Mil.189).

Kapota. Blue Rock Pigeon, sometimes also *pārāvata*, Hindi *kabutar* or *parawa*, *Columba livia* (Ja.I,244). A familiar bird the world over, the blue rock pigeon is slate grey with a shining metallic green and purple sheen on its breast and neck and pink legs and eyes. The English name is due to the pigeon's habit of nesting and roosting on cliffs and in rocky places. The pigeon is as much at home in lightly-forested and open country as it is in villages and towns and eats mainly grass seed (Ja.I,242). The Buddha described old bones as being pigeon-coloured (Dhp.149). One of the places around Rājagaha where monks sometimes used to stay was called Pigeon's Cave (Ud.39). According to the 5th Pillar Edict, Asoka forbade the killing of white pigeons and village pigeons. The *Arthaśāstra* mentions tying messages to the pigeon's legs. According to the *Jātakas*, the Bodhisatta was once reborn as a pigeon (Ja.I,242).

Kappāsika. Cotton Bush, Hindi *kapas* (Ja.I,350; VI,184), of which about eight species grow in northern India. The species mentioned in the *Tipiṭaka* might be *Gossypium arboreum* as Brahmins make their sacred threads only from this type, suggesting its antiquity. This species of cotton is a large shrub with slender, sometimes purple branches, small, smooth leaves and large, beautiful purple flowers. The round black seeds are embedded in a white fluffy wool-like fibre which can be made into thread

(S.V,284; Th.104; Vin.I,271). Leaves of the cotton bush were used as a medicine (Vin.I,201) and an oil can be extracted from the seeds. Cotton fibre and thread were called *picu*. Cotton cloth was the most common fabric used in ancient India. After being harvested and separated from the seed, the fibre was spun into thread and then woven into cloth (D.II,351).

Nakulamātā, one of the Buddha's female disciples, was very accomplished at spinning cotton (A.III,295) and the Brahmin Velāma once made a gift of 84,000 lengths of cotton cloth (A.IV,394). Cotton was used for a variety of purposes including padding sandals (Vin.I,196). When asked what should be done with his body after his final Nirvana, the Buddha said that it should be wrapped in new cloth, then in teased cotton wool and then in new cloth. That being done, it should be placed in an iron coffin and then cremated (D.II,141-2). Referring to one of his supernormal powers, the Buddha once said: 'Just as a wisp of fluff or cotton when blown by the wind easily rises up into the air, so too, when the Tathāgata immerses the mind into the body and the body into the mind and he abides in a blissful and buoyant perception towards the body, his body easily rises into the air' (S.V,284). Cotton was ginned with an instrument resembling a bow called *dhanuka* (Ja.VI,41), *dhunaith* in Hindi.

Kappūra. Camphor, *Cinnamomum camphora*. The name of a tree and a whitish crystalline aromatic substance extracted from it and certain other trees (Ja.VI,537). Camphor was used as a perfume (Ja.I,290, II,416), a medicine, to flavour water and in religious ceremonies. Ancient texts distinguished two types of camphor: 'unheated', i.e. free crystals found in the wood or on the bark; and 'heated', i.e. prepared by steam distillation. Both *Carakasamhitā* and *Suśrutasaṃhitā* mention the medicinal qualities of camphor and it is still used to treat diarrhea and as a cardiac stimulant. Because it burns with a strong incandescent light and leaves no ash, camphor has long been favoured for lamps in religious offerings.

Concerning the harvesting of camphor in India, Xuanzang wrote: 'The tree from which camphor scent is procured is in trunk, like the pine, but with different leaves, flowers and fruit. When the tree is first cut down and sappy it has no smell but when the wood gets dry it forms into veins and splits; then in the middle is the scent, in appearance like mica, in colour like frozen snow.' Apart from the camphor tree camphor can also be extracted from *Blumea balsamifera* (Sanskrit *kukudru*, *kukkuradru* or *kukundara*), *B. densiflora*, *B. junghuhniana* and *Nardostachys grandiflora*, although only the first of these plants is mentioned in the Tipiṭaka.

Kamala. A type of grass from which sandals could be made (Vin.I,190).

Kamalā.¹ Hindi *kamala*, *Mallotus philippensis* (Ja.V,159). A medium-sized tree with smooth grey bark, ovate leaves and large white flowers. A gland on the leaves gives a red powder which was used to dye silk.

Kamalā.² See **Padama**.

Karañja. Indian Beech, Hindi *karanj*, *Pongamia galbra* (Ja.VI,518), a small deciduous tree whose new leaves are bright green and glossy. The flowers are white and purple and the fruit is a woody oval oblong pod containing one or two seeds. The timber of the Indian beech is used for furniture and oil extracted from the seeds is used as an antiseptic for cuts and sores and also as an insecticide.

Karamadda. Sometimes *karamanda*, *Carissa carandas* (Ja.VI,536). A large shrub covered with strong forked thorns and bears an ellipsoid edible berry.

Karavīka. Cuckoo, sometimes *karavī*, of which four species are found in northern India (Ja.V,416). The bird mentioned in the Tipiṭaka is probably the Indian Plaintive Cuckoo, *Cacomantis passerinus*. When young, this cuckoo is a mottled rufous and when mature, dark-grey above, light-grey and white below, and with a black tail tipped with white. The cuckoo is frequently celebrated in the Tipiṭaka and other Indian literature for its beautiful call (Ja.V,204), a high pitched *pteer, pteer, pteer* and at other times a whistling pleasantly mournful *pi pi pi pee pee pee*. This call was considered 'sweeter, more beautiful, charming and delightful than that of any other bird' (D.II,20). One of the 32 special characteristics of a Mahāpurisa is that his voice is beautiful like that of the cuckoo (D.II,18; III,173).

Karavīra. Oleander, Bengali *karabi*, Hindi *kaner*, *Nerium odorum*. A medium-sized shrub with erect rod-like branches, narrow leaves tapering at either end and rose-coloured or sometimes white flowers (Ja.IV,92). Oleander is poisonous and even prolonged smelling of the flower can cause nausea. A garland of oleander blossoms was put around the neck of condemned criminals as they were led to execution (Ja.IV,191) and one type of arrowhead was called 'oleander leaf' because its shape was similar to the leaf of the oleander (M.I,429).

Karumbhaka. See **Nivāra**.

Kareri. Hindi *kari*, *Saccopetalum tomentosum*, (D.II,1; Ja.VI,534; Th.1062). A medium-sized tree with smooth brown bark and beautiful dark purple

flowers. The leaves turn a bright orange before dropping. In the Jetavana at Sāvattthī there was a hall next to a *kareri* tree (Ud.30).

Kalandaka. Squirrel, also called *kālakā* and *kālāya*. The two species of squirrel common in northern India are the Three-Striped Palm Squirrel, *Funambulus palmarum*, and the Five-Striped Palm Squirrel, *F. pennantii*. The first has a greyish-brown coat with three parallel black stripes running from its head to the end of its long bushy tail while the second is almost identical except that it has five stripes. Both squirrels are bold, inquisitive and endearing little creatures with a shrill metallic call which is accompanied by a vigorous jerking of the tail. They are commonly seen in urban areas where they dart up walls and lay on tree branches warming themselves in the sun. Sandals were sometimes decorated with squirrel skin (Vin.I,186). In the Bamboo Grove at Rājagaha there was a place where people came to feed the squirrels (M.II,45; Vin.II,74). See **Sākhāmiga** and **Sākhāssita**.

Kalambaka. A tree or shrub, sometimes *kalamba* and perhaps the same as *nicakalambaka* meaning 'little *kalambaka*' (Ja.VI,535).

Kalambukā. A type of water plant, sometimes also *kalambaka* or *kalanbukā* (D.III,87; Ja.VI,535).

Kalaviṅka. See **Kuliṅka**.

Kalāya. Sometimes also *varaka* (Ja.III,370; M.II,51; S.I,150). Identification uncertain, but possibly the Pigeon Pea, *Cajanus cajan* or Horse Gram *Macrotyloma uniflorum*. The first is an erect woody annual shrub with trifoliolate leaves spiralling around the stem and yellow flowers sometimes with purple or red streaks. The pod contains up to nine round seeds varying in colour from light beige to dark brown. The plant is now widely cultivated but also grows wild. Horse gram is a twining annual with a hairy stem and trifoliolate leaves and a greenish-yellow flower. The slightly curved pod containing six to eight light brown to black collared flattened bean-shaped seeds. The seeds are mainly used as a cattle feed (Ja.II,74) but sometimes also eaten by the poor. *Kalāya* were sometimes steamed and fed to cattle (Ja.II,74). While practising austerities before his enlightenment, the Buddha ate soup made from *kalāya* (M.I,245). In a famous Jātaka story, a foolish and greedy monkey let go of a handful of *kalāya* in order to retrieve one that it had dropped (Ja.II,74-5).

Kaliṅgu. A type of tree (Ja.VI,537).

Kallahāra. See **Sogandhika.**

Kasāya. A reddish, brown or tawny-coloured substance used to dye ascetic's robes, sometimes also *kasāva*. So associated was *kasāya* with renunciation that the word came to be used for the monk's robes (Dhp.307; J.IV,114; Th.966). A certain astringent medicinal decoction was also called *kasāya* (Ja.V,198; Vin.I,201). This suggests that *kasāya* was derived from a plant or plants. Yijing, the Chinese monk who travelled through India in the 7th century, said that the *kasāya* was understood to be the same colour as pulverized sandalwood.

Kāka. Crow, also called *apandara*, *bala*, *dhanka*, **kākola** 'the dark feathered one', *vantāda*, 'scrap-eater' and *vāyasa*, Hindi *kowwa* (D.I,9; Ja.II,439; V,268; S.I,190; Th.599). Several species of crow live in northern India, the most common being the House Crow, *Corvus splendens*, and the Jungle Crow, *Corvus macrorhynchos*, also called *vanakāka* in Pāli (Ja.III,247). The first is black with a grey neck, mantle and breast while the second is a glossy black all over. Both are alert, aggressive and daring birds that do not hesitate to attack animals much larger than themselves either to rob them or to protect their young. The Buddha said that crows are truculent and pushy, greedy and gluttonous, cruel and pitiless, rough and harsh-voiced, muddle-headed and given to hoarding things (A.V,149). They are described as making a *kā ka* sound (Ja.IV,72). One monk was said to have had a voice like a crow (Vin.I,115), meaning that it was harsh and unpleasant.

Commenting on the fact that crows are always lean, the Jātaka says: 'Their hearts are always agitated and they vex the whole world, therefore crows have no fat on them' (Ja.I,486). In one place a crow is described as turning over dry cow patties to eat the insects under them (Ja.I,242), and in another we read of an abandoned infant surrounded by crows (Vin.I,269). We also read of crows picking out the eyes of an impaled criminal with 'their dagger-like beaks' (Ja.I,500). As soon as a devotee leaves a shrine, crows appear and examine the offering for anything edible (Ja.V,107). An old man is described as having feet like a crow, perhaps meaning that they were dry and scaly or that the toes were spread (J.VI,548).

The crow often featured in the proverbs of the Buddha's time. Leftover food was called 'a crow's meal' (Ja.II,149) and a presumptuous boastful person was called a 'crow hero' (Dhp.244). A boy of seven or eight was said to be 'big enough to frighten the crows' (Vin.I,79) and to have 'the wisdom of a crow' meant making a decision based on greed rather than common sense (Ja.V,255). To be helpless was to be 'like a crow with its wings clipped' (Ja.I,304). A river or pool could be 'full enough for a

crow to drink from' (D.I,244) and crops growing well were 'high enough to hide a crow' (Ja.II,174). Crows often appear in the Jātakas where they are usually depicted as cunning, greedy creatures.

Kākola. Common Raven, *Corvus corax* (Ja.III,247; VI,566; Sn.675). With jet-black plumage, the raven is larger and heavier than the crow and has a wedge-shaped tail. Common in Punjab and Rajasthan during the winter, the raven is only occasionally seen in northern India.

Kādamba. A type of goose with grey wings (Ja.V,420), probably an alternative name for either *cakkavāka* or *haṃsa*.

Kāra. Curry Leaf Tree, Hindi *kurry patta*, *Murraya koenigii* (Ja.IV,238), a medium-sized tree with fragrant white flowers and small pointed serrated-edged leaves. Being very aromatic and having a sharp taste, these leaves are used to flavour food and chewed as an appetizer (Ja.VI,24). They are also eaten during famines and by the poor. According to the Jātaka, when the Bodhisatta was an ascetic living in the forest he used to eat curry leaves after having soaked them in water without salt, buttermilk or spices in it, suggesting that that was the usual way to eat them, perhaps as a sort of salad (Ja.VI,21).

What is called curry today is a combination of spices powdered and then added to food to flavour it. The Pāli word for a curried dish is *sūpa* and is usually used together with a variety condiments (A.III,48). It is not known what was used to make curry powder at the time of the Buddha, but the essential ingredients of most modern curries are turmeric, *halidda*; black pepper, *marica*; cumin, *jīraka*; coriander and chilli. Chillies were not known in India until the 16th century.

Kāraṇḍava. Grey Heron, Hindi, *khyra*, *Ardea cinerea* (Vv.35,8). A large heron with grey and white plumage, a bright yellow beak and a distinctive black stripe down its long s-shaped neck. The *Buddhacarita* mentions a grey heron standing on a lotus leaf (Bc.5,53).

Kālakokila. Pied Crested Cuckoo, Hindi *kala papaya*, *Clamator jacobinus* (Ja.III,102). A handsome crested bird with a black head, beak, wings and tail and a white breast and throat. It lays its eggs in the nests of other birds and has a rather mournful metallic call.

Kālamaccha. A type of fish. The name means 'black fish' (Ja.IV,442). See **Maccha**.

Kālasappa. See **Kaṇhasappa**.

Kālasīha. Black Lion (Ja.IV,208). This may have been a name given to the occasional male lions that have dark-brown or black manes. Even in the 19th century, lions in India were informally classed as either ‘black maned’ or ‘tawny-maned’. Alternatively, the term may refer to the panther. See **Dīpi** and **Sīha**.

Kālamahāmaccha. A type of fish (Ja.I,222). The name means ‘great black fish’. See **Maccha**.

Kālā. A type of plant which was comparable to a beautiful, slim woman (Ja.VI,269). The joints of the lean limbs of the forest-living ascetic were compared to the knots in the stem of the *kālā* plant (Th.243; 683). This could possibly be *Chlorophytum tuberosum*, a slender graceful shrub with beautiful star-shaped white flowers which open in the morning and close in the evening. The shrub flowers in May-June making it most noticeable in the sal forests where it commonly grows.

Kālāmeyya. A type of bird (Ja.VI,539).

Kāliya. A type of shiny sandalwood, sometimes *kāliya* (Ja.VI,536).

Kāsa. Hindi *kans*, *Saccharum spontaneum* (S.III,137). A tall grass sometimes reaching up to 1.5 metres high which often grows in thick clumps along the banks of rivers and streams. The leaf is very narrow and the flower produces a silvery-white down which can be carried by the wind for kilometres.

Kāsumārī. Ceylon Oak, Hindi *kusum*, *Schleichera trijuga* (Ja.V,324). A large deciduous tree which looks particularly attractive when covered with new leaves. The small greenish-yellow flowers grow in spike-like clusters and the fruit has edible skin. Oil extracted from seeds of the Ceylon oak is used to make soap and hair oil and a dye is made from the flowers.

Kiṃsuka. Flame of the Forest, also *palāsa*, Hindi *dhak*, *kimsuk* and *palas*, *Butea frondosa* (Ja.II,265). The Pāli name means ‘thing-me-bob.’ The *kiṃsuka* is a common, small to medium-sized tree usually with a blackish crooked trunk, broad leaves shiny on top and velvety underneath and which look greyish from a distance. A profusion of red or orange flowers appear after the leaves fall. The pods are velvety-brown, about 15 centimetres long and contain flat oval-shaped seeds. When flowering a blood-red juice issues from the trunk and branches and hardens into an

astrigent gum which has medicinal uses. Lac insects are often cultivated on this tree.

Once, a monk asked several of his fellows how insight is attained and each gave him a different answer. Confused, he went and told the Buddha what the other monks had said and the Buddha replied:

‘Suppose a man who had never seen a *kiṃsuka* tree went and asked another man what such a tree looked like. The other might answer “A *kiṃsuka* tree is blackish, like a charred stump”. So for the first man it would appear as the other man sees it. Then he might go to another man and ask him what a *kiṃsuka* tree is like and the other might reply “It is reddish, like a piece of meat”. So for him it would appear as the other man sees it. Then he might go to yet another man and ask him what a *kiṃsuka* tree is like and the other might say “Its bark hangs down in strips and its pods burst like a *sirīsa*”. So for him it would appear as the other man sees it. Finally, the man might go to one more person and put his question again and the other might reply “A *kiṃsuka* tree has a thick foliage and gives a close shade like a banyan tree”. So for him it would appear as the other man sees it. In the same way, those advanced men each gave you their answer according to their purified vision.’ (S.IV,193).

According to the Jātaka the Bodhisatta was reborn as a spirit in a flame of the forest tree worshipped by the people of Vārāṇasi (Ja.III,23).

Kiki. Indian Roller, *Coracias benghalensis* (J.V,408). About the size of a pigeon, the Indian roller has a large head, a heavy black beak and short legs. The bird is most well-known for its beautiful blue wings and harsh raucous call. It gets its English name from its spectacular courtship display which involves dramatic somersaulting, darting and nose-diving. The Pāli name is probably an onomatopoeia of the bird’s call.

Once the Bodhisatta used the example of the contrasting screech of the beautifully coloured roller to teach a beautiful but shrewish queen to speak more pleasantly (Ja.II,350). Popular tradition attributed the roller hen with strong maternal instincts, a belief reflected in a passage from the Jātaka: ‘The Teacher checks his disciples as a roller inspects her egg, a yak guards her tail, a mother her beloved child or a one-eyed man his only eye’ (Ja.III,375; see also Vism.36).

Kiṇṇa. Yeast, Hindi *kinva*. A fungi of the class *Ascomycetes* which is used to ferment the sugars in grains and fruits, to raise dough and to produce alcohol (Vin.IV,110). Five main types of alcoholic beverages are mentioned in the Tipiṭaka. *Meraya* (M.I,238) was distilled alcohol made from sugar or fruit and sometimes flavoured with sugar, pepper or the bark of *Gymnema sylvestri*. *Majja* and *surā* (Sn.398; Vin.I,205) were brewed from rice or flour but later these names were used generally for any fermented beverage. The Jātakas say that *surā* was made from sugar cane juice (Ja.IV,161). *Āsava* was also a generic name (Ja.IV,222) and later five types were recognized - that made from flowers, fruit, honey, sugar or a mixture of some or all of these ingredients. The *Arthaśāstra* gives this recipe for *āsava* as follows: 10 *palas* of *kapitha* pulp, 500 *palas* of sugar cane juice and 1 *prastha* of honey.

Jalogi or *jaḷogi* was the juice of the *khajjūra* or the wild date palm and the *tāla* either brewed or distilled. Whether *jalogi* could be drunk by monks and nuns even before it had been fermented, was one of the points discussed during the Second Council (Vin.II,301). This debate probably concerned the fact that before palmyra or wild date juice is properly brewed, it spontaneously ferments within a few hours of being tapped, producing approximately 3% alcohol. Other types of alcoholic beverages were *kapotika* (Vin.IV,109), *madhu* (S.I,212) and *vāruṇi* (A.III,213).

The Jātakas tells a legendary but plausible story of how alcohol was discovered. Long ago in a certain forest there was a fruit tree which had a large forked trunk with a depression in it. Rain water collected in the depression, fruit fell into it and warmed by the sun it fermented. In the summer, thirsty birds drank from the depression, became intoxicated, fell to the ground and after sleeping for a while, flew away. A hunter observed this and curious as to its cause, he too drank some of the liquid and became intoxicated. Later, he introduced this drink to his friends and so it was that alcohol became known. According to the Jātakas, this discovery opened the way for innumerable social ills (Ja.V,12-20).

Concerning the consumption of alcohol, the Buddha said: 'Whoever follows the Dhamma should not drink or encourage others to do so, knowing that intoxication is the result. Because of intoxication the fool commits evil deeds and makes others negligent too. So avoid this root of wrong, this folly loved only by fools' (Sn.398-9). See **Muddikā**.

Kipillikā. See **Pipīlikā**.

Kimi. Worm, Hindi *kim*. Like its English equivalent this Pāḷi word is a descriptive term for a wide variety of unrelated creatures that have soft, elongated bodies without any appendages, including the larva of certain

insects, i.e. maggots (A.III,241; Sn.201). *Kimi* were also said to destroy crops so the word must have also been used for caterpillars (Mil.307). The *Milindapañha* says that camels, oxen, asses, goats and humans all get worms (Mil.100) and the *Visuddhimagga* mentions 32, and in another place, 80 different species of intestinal worms that infect humans (Vism.235; 258). See **Puḷava**.

Kimpurisa. A type of animal, perhaps mythological (A.I,77; Ja.IV,254; V,42; 416; VI,497).

Kimpfala. A tree similar to the mango but bearing poisonous fruit (Ja.I,271; 367). This may have been an actual species of tree but it seems more likely that it was fictional.

Kīṭa. Insects, sometimes *kīṭaka* (M.III,168; Vin.I,188), Hindi *kit*. Insects are small six-legged invertebrates of the class *Insecta*. Some of the different types of insects mentioned by the Buddha include those attracted to the smell of dung, those that live in dark places, others that live in rotting or putrid matter (M.III,168) and still others, *adhipāta*, that are attracted to lamps at night (Sn.964; Ud.72). Then there were various insects that monks and nuns living in the forest had to learn to endure: *daṃsa*, a biting fly (M.I,10) and *andhaka*, meaning 'blind' (Sn.20). Four other insects mentioned are the *cīrīlikā*, *hīṅgujālaka* or *hīṅgujālīka* (Ja.VI,536), **paṭaṅga** and the **salabha**.

Monks and nuns were expected to examine water before using it to make sure there were no tiny creatures in it, most of which would have been either insects or their larva, that might be injured or killed when the water was used (Vin.IV,48). The justification for the rule about not travelling during the rainy season was that in doing so a monk might kill some of the insects that proliferate and swarm during that time (Vin.137). Scrupulousness towards tiny creatures came to be seen as a sign of the most sensitive compassion as is suggested by Aśvaghōṣa's description of Prince Siddhārtha's reaction to seeing plowing being done: 'Clumps of grass turned up by the plow lay scattered on the ground and were covered with tiny dead creatures, insects and worms, and as he saw this he grieved as if one of his own kinsmen had been killed' (Bc.5,5).

Kukutthaka. Common Hoopoe, *Upupa epops* (Ja.VI,538). One of the most attractive north Indian birds, the hoopoe has light brown plumage, black and white-striped wings and tail, a long thin slightly-curved bill and a fan-like crest in its head which it opens and closes from time to time, especially when the bird alarmed. It has a gentle musical '*hoo popo*' call repeated sometimes for up to ten minutes at a time. In the Dīgha Nikāya,

the hoopoe is mentioned together with several other birds that have pleasant calls (D.III,201-2). Hoopoes are usually seen singly or in pairs feeding on lawns or in open grassy country.

Kukkuṭa. The name for both the Domestic Fowl, *Gallus domesticus*, and the Red Jungle Fowl, *Gallus gallus*, the first being the direct and recent ancestor of the second, sometimes also *kukuṭaka* (D.III,202; Ja.I,436; VI,538; Vin.IV,63). Domestic chickens were kept for their eggs and meat. Cocks woke people early in the morning and cock fighting was a popular entertainment (D.I,6). The Buddha said that in the distant future, villages would be so close together that a cock would be able to fly from one to the other (D.III,75). A hen might hatch a brood of eight or ten eggs and if she brooded them properly, warmed them properly and turned them properly, the chicks would safely break out of the shell using the claws on their feet and their beaks (A.IV,125-6). When King Milinda expressed doubt to Nāgasena about the Buddha's statement that the beginning of *saṃsāra* cannot be known, Nāgasena asked him in reply: 'As an egg comes from a chicken and a chicken from an egg, is there an end to this series?' (Mil.51) This seems to be the earliest use of the well-known and popular 'chicken and egg' dilemma.

The male red jungle fowl has glossy rufous and black plumage, a red comb and a long sickle-shaped tail. It has 'wings that flash so gaily and a comb that droops so gracefully' (Ja.III,265). The hen has a light-brown breast, a dark-brown back and tail and a mottled neck. A park at Pāṭaliputta called Kukkuṭārāma (M.I,349) gradually evolved into a monastery and was the venue for the Third Council convened by Asoka.

Kukkura. See **Soṇa**.

Kukkusa. See **Taṇḍula**.

Kukkuha. A type of bird (Ja.V,406; VI,538).

Kuṭaja. Hindi *kuṭaja*, *Holarrhaena antidysenterica* (Ja.IV,92; 497). A small shapely tree with a creamy white flower and brownish bark which peels off in long papery flakes. A decoction of *kuṭaja* was used as a medicine (Vin.I,201).

Kuṭaji. A type of tree (Ja.VI,497; 530).

Kuṭṭha.¹ Leprosy, probably also *kilāsa*, Hindi *kush*, a chronic infectious disease caused by the *Mycobacterium leprea* bacillus (Ja.VI,197; 383). This pathogen invades the nerves, skin and mucous membranes, causing insensitivity. White or pale patches appear on the skin, particularly on the

hands and feet (Ja.V,69). In time, the loss of fingers, toes and nose, muscular paralysis and blindness can occur. Mahā Kassapa once ate the food from his bowl even though a finger of a leper who had offered him the food had fallen into it (Th.1054-6). Once a 'pathetic, poor, wrenched leper' named Suppabuddha stood at the edge of a crowd listening to the Buddha preach. Noticing this and sensing that he was receptive to the Dhamma, the Buddha modified his talk to suit Suppabuddha's disposition and level of understanding and as a result he attained enlightenment (Ud.48). The Buddha mentioned that lepers would sometimes get maggots in their sores (M.I,506).

Kuṭṭha.² Also *kelāsa*, Hindi *kuttra*, *Limnophila armoatica* (Ja.VI,535). A small aromatic bush, velvety all over, with pinkish or white flowers and commonly found growing in marshes and on the banks of ponds and tanks. The juice of this tree is given to nursing mothers whose milk is believed to be bitter.

Kutumbaka. A type of flower (Ja.I,60).

Kutthu. See **Soṇa**.

Kudrūsa. Kodo Millet or Indian Crown Grass, Hindi *khodoadhan*, *Paspalum scrobiculatum*. A small perennial grass usually growing wild but sometimes cultivated for its seeds which can be eaten as an inferior food. Kodo millet grows well in poor soil and is drought resistant. The Buddha said that in the distant future, when society degenerates, this grain will be the staple food (D.III,71).

Kunta. A type of bird (Ja.IV,466).

Kuntanī. A bird, perhaps a type of heron (Ja.III,134; 135).

Kunthakipillaka. A type of ant (Ja.I,439; IV,142; Sn.602). The Buddha said that a monk should not intentionally take the life of anything, not even that of a *kunthakipillaka* (Vin.I,97). See **Tambakipillaka**.

Kumuda. See **Paduma**.

Kumbhaṇḍī. A type of gourd or pumpkin which could be eaten (Ja.I,312; 411; V,37; VI,536).

Kumbhīla. Marsh Crocodile, also called *sumsumāra* or *susumāra*, *Crocodylus palustris* (M.I,459; Thi.241). A large amphibious reptile growing

up to 5 metres long that used to live in the Ganges and its tributaries but is now confined to a few game parks. They were considered one of the perils of going down into the water (A.II,123) and were sometimes put in the moats around cities and fortresses (Ja.VI,407). We read of a crocodile being harpooned because it was eating fish (Ja.II,227). It was noticed that they sometimes swallow pebbles and grit (Mil.67). To 'see a crocodile in a drop of water' was a proverb for imagining danger where there was none (Ja.I,216). Another proverb with the same meaning was to 'see a crocodile in a water pot' (Ja.IV,165). When visiting Bhesakalā, the Buddha used to stay at a place called Crocodile Hill (A.II,59). Crocodiles appear in several Jātaka stories where they are usually depicted as crafty dangerous creatures (Ja.I,278; II,158; III,133). See **Gaha** and **Susuka**.

Kumbhīlaka. A type of bird (Ja.IV,347). The name means 'little crocodile'.

Kumma. Sometimes *kuma*. See **Kacchapa**.

Kummāsa. Lyon Bean, Bengali *khamach*, *Mucuna nivea* (D.I,76; Ja.IV,352; Vv.80,9). A twining herb with a white flower the seeds and pods of which are edible. Balls or lumps of this grain were eaten for breakfast and it was also probably made into a gruel (Ja.III,405-6). When the Bodhisatta gave up self-mortification he regained his strength by eating boiled rice and *kummāsa* (M.I,247). When Ven. Raṭṭhapāla returned to his home to beg for alms after having become a monk, his parents, failing to recognize him, refused to give him anything. He saw the household slave about to throw away the remains of the previous evening's meal of Lyon beans and asked her if she would put it in his bowl (M.II,62). *Kummāsa* was considered a low quality food. The *Chāndogya Upaniṣad* mentions villagers eating it after their crops had been destroyed by locusts. See **Māsa**.

Kuyyaka. A type of flower (Ja.I,60).

Kurañjiya. A type of plant (Ap.448).

Kuraṇḍaka. A type of plant, sometimes *korāṇḍaka* (Ja.V,473; VI,536).

Kurara. A raptor described as being spotted or variegated (Ja.VI,501; 539). This could refer to at least six north Indian birds, the most common being the Laggar, *Falco jujjer*. About the size of a crow, this hawk has a grey back and wings and a white breast with grey and brown streaks. The laggar preys on pigeons, rodents and lizards and used to be trained for hunting. Its call is a high-pitched prolonged 'whi-ee-ee'. In ancient Indian literature the cry of a woman in distress is often compared to this bird's call. In

Avanti there was a place called the Laggar's Haunt on the side of a steep mountain (A.V,46; S.III,9).

Kuravaka. *Barleria cristata* (Ja.I,39, IV,440). A small shrub with beautiful bright rose-coloured flowers. It is a very variable plant and the flowers are sometimes also white.

Kuruṅga. The Four-horned Antelope, *Tetracerus quadricornis*. This small slender animal varies in colour from yellowish-brown to reddish with white underparts. Unique amongst animals the male has four horns, two between the ears and the others smaller ones on the forehead. It prefers open dry forest near water and generally shies away from human habitation and is still relatively common in isolated pockets of forest in northern India and the lowlands of Nepal. The skins of this animal were used as mats (Vin.I,192) and ascetics sometimes used them as clothes (Ja.I,173; II,153).

Kuruvinda. A type of grass (Ja.IV,92).

Kulattha. Horse Gram, Hindi *kulati*, *Dolichos biflorus*. A small widely cultivated herb covered with long soft hairs and which produces grey kidney-shaped seeds. These seeds are considered to be a low quality food and are eaten by the poor or fed to cattle. Before his enlightenment, while practising austerities, the Buddha ate soup made from horse gram (M.I,245). Pāṇini said that horse gram grows at the end of the rainy season.

Kulala. A type of raptor often mentioned together with vultures and crows (Sn.675). The feathers of this bird were used to make flights for arrows (M.I,429).

Kulāva. A type of bird, perhaps a variation of *kuliṅka* (Ja.VI,538).

Kulāvāra. A type of tree or shrub (Ja.VI,535).

Kuliṅka. House Sparrow, sometimes *kalavinka*, *kuliṅga* and *kulunka*, *Passer domesticus* (Ja.III,478; 541; V,357; IV,250). Probably India's most common and recognizable bird, sparrows live almost exclusively in towns and villages. The male is a mottled chestnut-brown with a black throat and a white breast while the slightly smaller female is a lighter chestnut-brown all over. Sparrows are omnivorous, eating grain, flower buds, grasshoppers and kitchen scraps and make their large untidy nests under the eaves of village houses.

Kulīra. Land Crab, also called *kakkaṭaka* or *kattaka*, *Paratelphusa spinigera*. These small crabs burrow holes in the banks of rivers, ponds and paddy fields (Ja.I,222; III,293). Crabs are described as having claws, a bony shell, projecting eyes, being hairless and being born in water (Ja.III,295). They make a clicking sound in their holes (Ja.II,376). Village children would sometimes pull crabs out of ponds and kill them with sticks and stones (M.I,234; S.I,123). The commentary to the *Vimānavatthu* says the Buddha once recommended crab soup as a cure for an ear ache (Vv-a.54).

Kulīraka. The name for birds of Order *Coraciiformes*, i.e. kingfishers and related birds (D.III,202). The name is probably related to the kingfisher's habit of catching crabs, *kulīra*, and smashing them on tree branches.

Kusa. Hindi *kosa* or *kus*, *Desmostachya cynosuroides*. A type of perennial grass with a sharp spiky leaf growing up to 0.9 metre high and with deep roots (S.III,137, IV,198; Th.27). As a penance, ascetics sometimes wore garments made out of *kusa* grass (A.I,240; D.I,167) and it was used in the Vedic sacrifice and other Brahminical rituals (A.V,234). *Kusa* grass is used for thatching roofs and making brooms. Fishermen would string their catch on a blade of *kusa* grass (It.68). Clumps of *kusa* indicate water below (Ja.I,108). There is mention of a type of blue or dark-coloured *kusa* (J.IV,140). The Buddha said: 'Just as *kusa* grass not properly grasped cuts the hand, so too the monastic life not properly lived leads to purgatory' (Dhp.311). Legend says that the Buddha sat at the foot of the Bodhi Tree on *kusa* grass which had been offered to him by a man named Sothhika or Sothhiya (Bv.22,25; Ja.I,70). According to the *Jātakas*, the Bodhisatta was once reborn as a spirit in a clump of *kusa* grass (Ja.I,441).

Kusumbha. Safflower, Hindi *susum*, *Carthamus tinctorius*. A erect branching herb with broad serrated leaves and large orange-red flowers. The safflower was used for making a red dye and we read of it being grown in a king's garden (Ja.I,499; V,211). An edible oil is also extracted from the seeds. The down of an adolescent boy's chin is described as being the colour of the flower (Ja.IV,482).

Kusumbhara. A type of plant (Ja.VI,535).

Keka. Hindi *kekar*, *Garuga pinnata* (Ja.V,405). A large tree with smooth grey flaky bark, yellowish-green globose fruit and yellow flowers. Juice from the leaves mixed with honey is said to soothe asthma attacks.

Ketaka. Screw Pine, Hindi *ketaki*, *Pandanus odoratissimus* (Ja.VI,269). A many-branched tree having long spirally-arranged leaves with toothed

edges and a large fruit looking something like a pineapple having a sickly sweet smell when ripe. A fibre is made from the tree and the flower can be eaten. The screw pine usually grows in sandy soil on the coast, or near swamps. A beautiful girl was said to have eyes like the flower of this tree (J.IV,482).

Kesari. A type of lion, sometimes also *kesarasiha*. The name means 'the maned one'. It is not certain whether this is an alternative name for the lion or refers to a mythological lion or to a sub-species of the Asiatic lion which lived in the lower Himalayas and is now extinct (Ja.II,244; III,460). According to the *Milindapañha*, these lions were light in colour (Mil.400). See **Siha**.

Koka.¹ Possibly a misreading of *keka*. If not, it could refer to the Kokum Butter Tree, Hindi *kokam*, *Garcinia indica* (Ja.V,405). An erect medium-sized tree with slender drooping branches reaching down almost to the ground. The fleshy yellow flower exudes a yellow milky juice giving the tree its English name. The pleasant-tasting fruit is a favourite food.

Koka.² Wolf, also called *vaka*, Hindi *kok*, *Canis cova* (Ja.I,336; V,525; Sn.201; Vin.III,58). A large dog-like animal with grey fur intermingled with black especially on the forehead and tip of the tail. Wolves attack livestock and have been known to carry off children. Using a proverb similar to the English one, the Jātakas say that some ascetics and priests are 'wolves disguised in sheep skins' (Ja.V,241).

Kokanada. See **Paduma**.

Kokanisātaka. A type of animal (Ja.VI,538). The name means 'wolf killer' and may refer to the leopard or lion.

Kokāsaka. See **Paduma**.

Kokila. Asian Koel, Hindi *koel*, Bengali *kokila*, *Eudynamis scolopacea* (Ja.II,350; Vv.11,1). Two types of koel are mentioned, the black (*kāla*) and the speckled (*citra*), which refer to the male and the female respectively (Ja.V,416; 419). The male koel is a glossy black with a yellow bill and crimson eyes while the female is brown coloured with white spots and bars. Koels are a type of cuckoo and lay their eggs in the nests of other birds (Ja.III,102). During the summer the bird's pleasant 'koo-koo-koo' call is often heard at dawn. The nun Ambapālī said that when she was a young courtesan her sweet singing was like that of the Asian koel (Thi.261).

Koñca. Indian Pond Heron, Hindi *konch bak*, *Ardeola greyii*. A earthy brown wading bird with glistening white wings. It is often seen patiently waiting on the edges of rivers and ponds and jabbing at any movement in the water. Its diet consists of small fish, crabs and insects. According to the Jātakas, this bird has a beautiful cry (Ja.V,304), which to the Indian ear resembled the trumpeting of an elephant (Ja.IV,233; Mil.76). Consequently, one of the words for elephant was *koñca* (Vin.III,109). The Buddha said: ‘Those who have not lived the holy life, who have not acquired wealth in their youth, pine away like old herons at a pond without fish.’ (Dhp.155; S.II,279; Th.1113). There was a curious belief in ancient India that this bird and other herons had the ability to separate milk from water. The Buddha said: ‘The wise person shuns evil, like a heron that drinks milk and leaves water’ (Ud.91).

Koṭṭisimbali. See **Simbali**.

Koṭṭha. Jew’s Mellow, Hindi *koshta*, *Corchorus olitorius* (Ja.V,420). A small herb with slender leaves, a yellow flower and sometimes cultivated for its jute-like fibre.

Koṭṭha. Woodpecker, sometimes also *rukkhakoṭṭhasakuna* or *satapatta*, Hindi *katphora* (Ja.II,153; II,386; III,327), birds of the family *Picidae*. Woodpeckers have short legs for gripping tree trunks and a sharp pointed bill designed for chiselling holes into wood. There are eight species of woodpeckers in northern India although it is not possible to identify any of them from the information given in the Tipiṭaka. Woodpeckers peck at trees until the insects come out and then eat them (Ja.II,162). In a well-known Jātaka story, a lion with a splinter of bone stuck in its mouth begged a woodpecker to remove it and promised to help the bird in return. The woodpecker removed the splinter but later the selfish ungrateful lion refused to keep its promise. According to the Jātakas, the Bodhisatta was once reborn as a woodpecker (Ja.II,162).

Koṭṭhu. See **Sigāla**.

Koraṇḍaka. Porcupine Flower, *Barleria prionitis*, sometimes *koranda* (Bv.1,57; Ja.V,473, VI,536). A thorny shrub which has yellow flowers, and whose elliptic leaves are each tipped with a spine.

Kolaṭṭhi. See **Badara**.

Koviḷāra. Variegated Bauhinia, *Bauhinia variegata* (Ja.V,29), an ornamental tree with thick broad leaves, a stocky trunk and large beautiful

mauve and white flowers splashed with purple. The tree drops its leaves before flowering. The *Sutta Nipāta* says a monk should give up the marks of a householder the way the leaves drop off the bauhinia tree (Sn.44). A type of bauhinia called *pāricchattaka*, meaning literally ‘giving broad shade’, was believed to grow in the Tāvatiṃsa Heaven where it gave great delight to the gods (A.IV,117). Flowers from this celestial tree fell from the sky as the Buddha lay dying at Kusinārā (D.II,137). The leaves of the variegated bauhinia are used to make country cigarettes and the buds are sometimes pickled and eaten.

Kosakāraka. Silk worm, sometimes *kosakimi*, the caterpillar of several species of moths that produce a fine fibre which can be woven into cloth (A.I,181; IV,394). Chinese mulberry silk from *Bombyx mori* became known in India by about the 2nd century BCE and is mentioned in some of the late texts in the Tipiṭaka (Bv.24,11; Ja.I,43). However, most silk in ancient India was wild silk produced by moths such as *Antheraea mylitta*, *A. paphia* and *Philosamia ricini*. The cocoons were collected from the wild and only after the worms had gnawed through them and thus the thread was not unraveled but carded and then spun into yarn. This meant that the cloth made from it was heavier and rougher than Chinese silk, although still beautiful and much-sought-after. To loosen the silk threads, cocoons had to be boiled and silk-making was a recognized trade (Vin.III,224). The famous brocade of Vārāṇasi which Prince Siddhattha wore before his renunciation, was made of silk (A.I,145). Monks were allowed to have silk robes (Vin.I,281) although they were not allowed to have carpets which had silk in them (Vin.III,224).

Kosambha. A type of plant (Ja.V,8; VI,456).

Kosātakī. Angled Gourd, *Luffa acutangula* (A.I,32; V,212), an annual creeper with large leaves and tendrils and often seen growing all over the roofs of village houses. The long, strongly ribbed gourd is very bitter and is eaten before ripening and the flat black elliptic seeds have emetic and purgative properties. We read that a lay woman once offered four of the large orange flowers of the *kosātakī* to a stūpa (Vv.47,4).

Kosika. A generic name for owls, sometimes also *kosiya* (Ja.II,353; V,120). An adulteress would be dubbed ‘an owl-like one’, perhaps because like the bird, she would slink around at night (Ja.I,496). See **Oluka**, **Siṅgila**, **Uhuṅkara** and **Ulūka**.

Khagga. Greater One-Horned Rhinoceros, also called *khaggamiga*, ‘sword creature’ and *khaggavaja*, Hindi *karg*, *Rhinoceros unicornis* (Ja.III,76; IV,497;

V.416; 406; VI,277; 538). Unlike the African varieties, this rhinoceros has thick slate-grey armor-like plates on its body and a single horn. This last characteristic, unique among animals, is referred to in the refrain of the famous Khaggavisāṇa Sutta to 'be alone like the rhinoceros' horn' (Sn.35-75). The rhinoceros was once widely distributed throughout northern India as far as the Indus River delta but is now restricted to small forest reserves in Nepal, West Bengal and Assam. See **Palasata**.

Khajjūra. Date Palm, Hindi *khajur*, *Phoenix dactylifera* (Ja.VI,269). A tall stately tree with a bushy crown that produces numerous oblong elliptical reddish-brown berries with a single seed and a sweet taste, which were a popular food. We read of fowl being prepared for cooking by being smeared with a paste made of white ginger, mustard and sour dates (Ja.III,225). According to the Jātakas, the Bodhisatta once made a living by selling dates (Ja.I,296). Although the date palm grows in northern India, it is not common. *Khajjūra* probably refers mainly to the Wild Date Palm, Hindi *khajuri*, *Phoenix sylvestris*. This tree is smaller than the date palm, its fruit has only scanty flesh and it is cultivated mainly for the sweet juice it produces and from which an alcoholic beverage is made (Vin.II,301). The wild date is commonly found around north Indian villages and is easily recognizable by the wedges cut into the top of the trunk from where juice has been extracted. See **Kiṇṇa**.

Khajjopanaka. Firefly, insects of the *Lampyridae* family that have luminous glands in one or more segments of their abdomens which emit a light used as a mating signal (Ja.II,415; VI,441; M.II,34). A proverb said: 'When you want a fire, you do not blow on a firefly' (Ja.VI,372). The Buddha said that just as a firefly's glow lasts only as long as the sun has not risen, in the same way, other religious teachers shine only as long as the fully enlightened Buddha had not appeared (Up.73).

Khadira. Hindi *khair*, *Acacia catechu* (Ja.IV,87). A medium-sized tree with black bark, slender branches covered with hooked thorns and a small white or sometimes pale-yellow flower. The leaf consists of spine with tiny leaflets on it. The timber of this tree is strong and durable, and wood chips are boiled to produce a substance which is added to betel and sometimes used in medicine. We read of bowls and stakes for impaling criminals being made out of *khadira* wood (Ja.IV,29) and of woodpeckers living in a grove of *khadira* trees (Ja.II,162). The Buddha commented that because of their size and shape, the leaves of neither the *khadira*, the *palāsa* or the *āmalaka* can be made into a container to carry water (S.V,438).

Khīrapañṇi. Milk Tree, Hindi *khirni*, *Mimusops hexandra*. A large tree with rough grey bark, leaves clustered on the end of the branches and small white flowers. When plucked, the leaves exude a white latex and hence its Pāli name 'milk leaf tree'. The wood of this tree was used to make the shafts of arrows (M.I,429).

Khīrarukkha. A tree or trees the name of which literally means 'milk tree'. When cut, they exudes a white sap (Ja.II,274; S.IV,160). This is probably a general name for fig trees. A monk who saw a beautiful woman and was suddenly overcome by desire was said to have become 'like a milk tree felled by an axe' (Ja.I,303). See **Assattha**, **Pilakkha** and **Udumbara**.

Khudda. A type of honey produced by the Little Bee, *Apis florea*, called *kṣudrā* in Sanskrit, a small wild bee native to India. It is one of the eight types of honey listed by the *Carakasamhitā*. The Buddha described it as being 'clear and sweet' (A.III,369). He also describes a man at a crossroad squeezing this honey from the comb as an expectant crowd stood around waiting (M.II,5). See **Bhamara** and **Madhukara**.

Khuddakaveḷu. Dwarf Bamboo, *Bambusa nana*. This type of bamboo grows in thick clumps up to about 2.4 metres high and has small lance-shaped leaves. The stems start as green and gradually turn yellow (Ja.VI,456).

Khoma. Linen, a cloth made from the fibres of the Flax plant also sometimes called Linseed, *Linum usitatissimum* (D.II,188; 351; Vin.I,58; 296). The stems of this annual herb are soaked in water for several weeks and then beaten and scraped so that the fibre can be removed. The seeds also produce a useful oil. The beautiful blue flax flower was called *ummāpuppha* (D.II,260; Th.1068).

G

Gajakumbha. Elongated Tortoise, *Indotestudo elongatea*. Largely a forest dweller, this slow moving tortoise has stumpy pillar-like legs and a moderately humped yellowish shell with black blotches. The Pāli name means 'elephant pot'. It is described as a sluggish creature that takes all day to move just a short distance (Ja.III,140). See **Kacchapa**.

Gaṇī. A type of deer (Ja.V,406). The name means ‘of the herd’.

Gaṇḍatindu. A type of tree. According to the Jātakas, the Bodhisatta was once reborn as a spirit in one of these trees (Ja.V,99).

Gaṇḍamba. A type of tree (Ja.IV,264). The name means ‘distorted mango’.

Gaṇḍuppādā. Earthworm (Vin.II,151). Earthworms are segmented worms belonging to the class *Ologochaeta*. They burrow through the soil eating decaying organic matter, usually by swallowing the soil containing it, and then depositing the waste on the surface. The Buddha commented that earthworms spend their whole lives in darkness (M.III,168). They are sometimes mentioned together with *kimi* and *puḷava*.

Gaddha. See **Gijjha**.

Gadrabha. Donkey, Hindi *gadha*, *Equus asinus* (A.I,229; Ja.II,109). A short sturdy mammal with grey hair, long ears and a white muzzle. In one place a donkey recently relieved of its load is described as standing around looking sad and contemplative (M.I,334). Because of their ability to carry heavy loads donkeys were used mainly as pack animals although they were sometimes harnessed to chariots (D.II,343). Donkey fat was used as medicine (Vin.I,200).

Gavaya. Gaur, *Bos gaurus* (Ja.III,76; VI,497). Often mistakenly called a bison, the gaur has a massive head and chest and muscular shoulders. Males are a glossy black and females and the young are a coffee-brown. Despite being the world’s biggest bovine, the gaur is a gentle and timid creature. Gaurs are now extinct in northern India but are still found in Assam and parts of central and southern India.

Gavi. A creeper the fruit of which forest-dwelling ascetics used to eat (Sn.239). This may refer to *Vitis latifolia*, Bengali *govela*, a common jungle creeper with deep red-brown flowers and sweet black succulent berries.

Gaha. Gharial, *Gavialis gangeticus*, Hindi *gah*, *gharial* or *nakar* (S.IV,157). The Pāli name means ‘one that seizes’. This species of crocodile differs from the better-known varieties by having a very long narrow snout often with a large fleshy nodule on the end. Gharials live in the tributaries of the Ganges and Brahmaputra Rivers and in small streams and ponds where they eat almost exclusively fish. Although fierce-looking and sometimes growing up to 7 metres long, gharials never attack humans unless provoked. The Buddha said that a man seeing a pleasant-looking river

might go for a swim and allow himself to be carried along with the current. Seeing this, a more perceptive bystander might warn the swimmer of the presence of undercurrents, rapids, gharials and demons (It.114). The gharial is now rare in northern India and confined to a few nature reserves. See **Kumbhīla**.

Gijjha. Vulture, sometimes *gaddha*, also *sakunta*, Hindi *gidh*, Bengali *sukun*. The two commonest species of vultures in northern India are the Long-billed Vulture, *Gyps indicus*, and the Indian White-backed Vulture, *Gyps bengalensis*. The first is light to dark-brown with paler tips to the feathers and pale brown below. It is a sociable and silent bird. The second is brownish-black with a whitish ruff at the base of the neck. It is a gregarious bird, roosting and nesting in groups and producing an occasional harsh screech. Both birds have naked heads and necks. The Jātakas mentions a spotted or variegated vulture although no bird fitting this description is found in India today (Ja.VI,106). Vultures were often seen with dogs and jackals eating bodies in charnel grounds (Sn.201). Hunters used to trap them (Ja.III,330; IV,48; M.I,130) for their feathers, which were used as flights on arrows (M.I,429) and perhaps for their meat. They were believed to be able to see a carcass from a hundred *yojanas* away (Ja.III,331). A famous rocky crag in Rājagaha where the Buddha sometimes used to reside was called the Vulture's Peak, apparently because vultures perched on the rocks there. According to the Jātakas, the Bodhisatta was occasionally reborn as a vulture (Ja.II,50; III,330; IV,485).

Girikannika. Mussel Shell Creeper, Hindi *gokarni*, *Clitoria ternatea* (J.VI,536), a small slender vine with glorious azure blue or sometimes pure white flowers.

Giripunnāga. A type of plant (Ja.VI,530).

Guggula. A plant mentioned together with others which either are particularly fragrant or from which perfume is made (Ja.VI,537). This possibly refers to *Commiphora caudata*, Hindi *guggul*, or *Ailanthus triphysa*, known in Maharashtra as *gugguladhup*, although it is not clear whether this second plant grows in northern India. Both trees have a fragrant gum used in perfumes and incense. The first of these plants is a small deciduous shrub with greenish papery bark and yellowish flowers.

Guṇa. One or another of the two dozen or more wood boring beetles that live in northern India. These beetles lay their eggs under the bark of trees and the larva burrow into the wood. The *guṇa* could eat fig wood but not that of harder trees (Ja.III,431).

Gūthapānaka. One or another of the several beetles of the *Scarabaeidae* family found in northern India (Ja.II,211; S.II,228). Commonly called scarab or dung roller, these black or metallic-coloured, stout-bodied beetles have distinctive club-shaped antennae and broad front legs adapted for digging. Scarabs are commonly seen around villages rolling balls of cow dung or human faeces, which they later lay their eggs in and then bury.

Go. Domestic Cattle, also *gāvī*, *siṅgī*, 'the horned one' and *vasā* (Sn.26; Vin.I,191). Large mammals of the order Bovidae, the most common species in India being *Bos indicus*. The different types of domestic cattle recognized included suckling calves, *dhenupa*; yearlings, *taruṇavaccha*; milch cows, *dhenu* or *khīranikā*; red cows, *rohinī*; heifers, *vacchaka*; cows ready to be mated, *godharanī*; breeding cows *paveṇi*; bulls, *usabha*; oxen, *gona* and draught oxen, *balivadda* (A.II,109; M.I,226). Cattle were of different colours; black, white, red, tawny, dappled and grey (A.III,214).

There is little evidence in the Tipiṭaka of cows being regarded with the universal reverence they were to be given in later Hinduism. The Buddha described cows as harmless creatures, gentle like sheep, who willingly give pails of milk (Sn.309). He condemned Vedic sacrifice at which cattle were slaughtered. After being convinced by the Buddha of the cruelty and futility of such blood sacrifices the Brahmin Uggatasarīra released all the cattle he was about to slaughter with this benediction: 'I hereby grant them life. Let them be fed with green grass, let them drink cool water, and let the cool breezes blow upon them' (D.I,148). For some people at least, beef was an ordinary part of their diet. We read of a butcher or his apprentice displaying a butchered cow for sale at a cross-road (M.I,58). Leather, including that made out of cow hides, was used to make harnesses, bags, shields, mats, drums, shields, and water skins (Bv.1,31; Ja.VI,432; 454; Vin.I,193; II,122). There is mention of a man killing a calf, flaying it and using the skin to make a scabbard (Ja.V,106). Leather working was a recognized craft although it was considered a lowly one (Vin.IV,7).

Cattle were a symbol of wealth and to have many was a source of pride and joy (S.I,6). Cattle rearing is mentioned together with accountancy, archery and royal service as a worthy occupation (M.I,85; Vin.IV,6). Dairy products, or what were called the five bovine bounties (*pañcagorasā*, Vin.I,244), were an important part of the diet. These five were milk, curd, butter, ghee and the skimming of ghee (A.II,9). The process of making these foods was thus. Milk was boiled and when cooled a small amount of old curd was added, gradually turning the whole into curd. The curd was churned until it became butter, which was then slowly heated so that clear oil rose to the top and a residue settled on the bottom. The golden-coloured ghee was then separated from the residue becoming

the skimming of ghee (*sappimaṇḍa*, D.I,201; Mil.322) and this was considered the superior dairy product. Sometimes *takka*, Hindi *taak*, is included as one of the five bounties (Ja.I,340; Vin.I,244). This word is usually translated as buttermilk which in English is the name given to the opaque liquid that runs off as churned cream turns into butter. The Pāli *takka* probably refers to the runoff from churned curd mixed with a little milk or curd, a liquid slightly thicker and more sour or tart than Western buttermilk. One of the disputed practices discussed at the Second Buddhist Council was whether it was permissible for a monk to drink *takka* if it was offered to him after he had made it clear that he had finished his meal (Vin.II,301).

The cowherd's job was to take the animals out in the morning to graze and bring them back each evening (A.I,204), pick the eggs of parasitic flies off them, dress their wounds and light smoking fires at night to protect them from mosquitoes (A.V,347). During the growing season, watchmen had to make sure cows did not wander into the crops and eat them or tread them down (D.III,38; S.IV,195).

Cattle wandered through the streets of towns and villages and could injure or even kill people (Ud.8). Aggressive bulls sometimes had their horns cut off to prevent them from hurting anyone (A.IV,376). Cattle were marked, probably by cutting, as is done today, rather than by branding, and according to Pāṇini these marks should be made on either the ears or the rump. Bulls were castrated (Ja.IV,364; Thi.440). Cattle pulled ploughs and carts, their dung was smeared on the floor of homes (Ja.VI,413; Vin.III,16), fed to pigs (D.III,347), and when dried was used as a fuel (Ja.VI,508) and as a cleaning agent (S.III,131). A concoction of cow urine and yellow myrobalan was considered a cure for jaundice (Vin.I,206).

Cattle also had a part to play in certain Brahminical rituals. The Tipiṭaka describes a ceremony where the king would drink milk from a teat of a cow with a calf of the same colour, the queen would drink milk from a second teat, the court Brahmin from the third teat and milk from the fourth teat would be offered to the sacred fire (A.II,207). The torch used to ignite a person's funeral pyre was smeared with cow dung (A.II,95), and Brahmins believed they could make themselves ritually pure by touching cow dung (A.V,266). It was observed that if cows have cause to be frightened they would give less milk (Ja.I,388).

One of the 32 special characteristics of a Mahāpurisa is having eyelashes like those of a cow (D.II,18).

Gokaṇṇa. Nilgai, also called *gokānā*, *Boselaphus tragocamelus* (Ja.III,76; V,406). The Pāli name means 'cow ear' while the Hindi name from which the English comes, means 'blue bull'. Looking like a cross between a horse and a bull, the nilgai is India's largest antelope. It has an iron-blue coat,

high shoulders that slope down to a low rump and the male has short conical horns. The nilgai is most often seen at dusk lurking in the jungle bordering fields in preparation for raiding them when darkness falls. Because the Buddha stood aloof from debates, at least at some period of his career, he was accused of lacking the confidence to participate in such events. The ascetic Nigrodha said of him: 'As a nilgai circling around keeps to the fringes, so does the monk Gotama' (D.III,38).

Goṭṭhaphala. Very uncertain. It may refer to the fruit of *Solanum torvum*, Bengali *gota*, a small erect shrub, the yellow berries of which are used as a medicine. Alternatively, it may be the Towel Gourd, *Luffa aegyptiaca*, a climber with tough, smooth, angled stems and a cylindrical fruit about 15 to 46 centimetres long with dark coloured stripes. The fruit of the *goṭha* was used as a medicine (Vin.I,201).

Goṇasira. Probably another name for the wild buffalo (Ja.VI,538). See **Mahasi**.

Godhaka. A type of bird (Ja.VI,358). The name means 'little monitor' and could refer to Tree Creepers and/or Nuthatch, small birds of the *Sittidae* and *Certhidae* families. These small birds are able to move up, down and sideways on tree trunks and branches in a way similar to monitors.

Godhā. Common Indian Monitor, Hindi *goh*, *Varanus bengalensis* (D.I,9). This large lizard is olive, brown or grey above, yellowish below and with a dark streak on the temples. It can grow up to 1.70 metres in length with the tail often being longer than the body. It lives comfortably in almost any environment and is commonly seen peering out of burrows in termite mounds and from between rocks. Although the Indian monitor is completely carnivorous, eating small animals, birds, eggs, insects and carrion, there is a reference to one eating figs (Ja.II,118). This belief may have arisen because the monitor is sometimes seen high in fig trees where it lies in wait for birds. When termites would swarm after rain, monitors would dash about trying to catch them (Ja.I,488). Monitors were hunted, their flesh being considered a delicacy. Men would go into the forest with spades and dogs to track them down. They would light fires at the mouth of termite mounds to drive the monitors out and then catch and roast them (Ja.I,488; III,107). According to the Jātakas, the Bodhisatta was once reborn as a monitor (Ja.I,487).

Godhūma. Wheat, Hindi *godhum*, *Triticum sativum* (D.III,71; Vin.IV,264). Wheat is an annual or sometimes perennial grass of which there are many varieties. It has flat leaves and spiked seeds which are ground to produce

flour. A very ancient variety of Indian wheat and perhaps the one mentioned in the Tipiṭaka, is *Triticum dicocum*. After rice, wheat was the most important grain in northern India. There is mention of 'edibles made of flour' (Vin.I,248).

Gonaṅgula. See **Vānara**.

Gharagolikā. Northern House Gecko, *Hemidactylus flaviviridis* (Ja.II,147). A small nocturnal gecko with a light-grey, almost transparent body and large black eyes. The house gecko lives almost exclusively in human habitation and is to be seen at night around lamps waiting to snatch insects attracted to the light.

C

Cakora. A type of quail or partridge, perhaps the same as *caṃkora* (Ja.V,416; VI,538; Vv,35,8).

Cakkavāka. Brahminy Shelduck, Hindi *chakwa*, *Tadorna ferruginea* (Ja.III,520; VI,189). A large orange-brown duck, its head being slightly lighter in colour and with black wing tips and tail. Shelducks are often seen in pairs or small flocks on river banks where they eat vegetation, mollusk, insects and fish. The Jātakas describe the shelduck as reddish in colour, rounded in body and feeding off moss and green leaves (Ja.IV,70). The compound word *cakravāka* occurs in the *Ṛg Veda* and mean something like 'circle of sound'. Shelducks were probably given this name because pairs keep in touch at night by calling to each other. In later Indian literature the bird came to be associated with numerous virtues but especially with marital fidelity, although this gets no mention in the Tipiṭaka. However, the *Milindapañha* says: 'As a shelduck never forsakes his mate as long as life lasts, even so, a meditator, an earnest student of meditation must not forsake clear comprehension for as long as life lasts' (Mil.401).

Candana. Sandalwood. Both the Pāli and the English words are used loosely for a group of related trees that produce fragrant wood and oil. *Candana* refers primarily to *Santalum album* (Dhp.54), a small-sized evergreen tree with a small pale flower gradually becoming crimson. The heartwood of this tree, called *haricandana*, ranges in colour from whitish to yellowish and is strongly scented. The heartwood of the roots is even more so (Ja.I,146; Vv.83,1). The Tipiṭaka also refers to Red Sandalwood, *lohita-candana* or *ratta-candana*, *Pterocarpus santalinus* (A.III,237; V,22; Ja.IV,442; Mil.321). Both red and white sandalwood grow in the Deccan and South India and must have been imported into the north.

Sandalwood had many uses. It was pulverized and smeared on the body as a perfume and for its supposed cooling properties (Thi.145; 267). The paste was made by grinding a piece of wood on a stone (Ja.IV,440). Being soft, fine-grained and easy to carve, it was made into luxury objects (A.I,9). We read that a wealthy merchant had a bowl carved out of sandalwood. He even kept the off-cuts to use for other purposes (Vin.I,110). The Buddha said that when he was a prince he used only sandalwood from Vārāṇasi (A.I,145). Powered sandalwood (*candanacunṇa*) was sometimes rubbed dry on the body or burned as an incense, and it is

said that sandalwood powder fell from the sky just before the Buddha's final Nirvāna at Kusinārā (D.II,137).

The early Buddhists frequently equated sandalwood with things thought of as virtuous or holy: 'Just as a man who came across a piece of yellow or red sandalwood and he smelled it at the root, in the middle or at the top he would experience a beautiful, sweet and pleasant fragrance, even so, when one hears the good Gotama's Dhamma in all its parts one experiences elation and joy' (A.III, 237). The *Milindapañha* compares Nirvana to the precious and rare red sandalwood: 'As red sandalwood is hard to obtain, even so, Nirvana is hard to obtain. Again, red sandalwood is unequalled for its lovely fragrance, even so is Nirvana unequalled for its lovely fragrance. Yet again, red sandalwood is praised by good people; even so is Nirvana praised by the Noble Ones. These are the three special qualities of red sandalwood that are present in Nirvana' (Mil.321).

Xuanzang was told this tale concerning the harvesting of sandalwood and a tree similar to it: 'In the south of this country (Malakūta), bordering the sea, are the Malaya Mountains, remarkable for their high peaks and precipices, their deep valleys and mountain torrents. Here is found the white sandalwood tree and the *candaneva* tree. These two are much alike and the latter can only be distinguished by going in the height of summer to the top of some hill and then looking at a great distance great serpents may be seen entwining it; thus it is known. Its wood is naturally cold and therefore serpents twine round it. After having noted the tree, they shoot an arrow into it to mark it. In the winter after the snakes have gone, the tree is cut down.' Similar stories about where sandalwood grows and the serpents or dragons that live around it are to be found in Sanskrit works such as the *Amarakośa* and the *Kāvyaṁīmāṁsā*.

Camara. Yak, Hindi *ban chour*, *Bos grunniens* (Ja.I,149), a thick-set long-haired bovine native to the Tibetan plateau. Yak tails have been imported into India from ancient times. A yak tail fly whisk became associated with status and was also one of the symbols of royalty, along with the white umbrella, turban, shoes, sword and conch (Ja.II,330). The Buddha said that ascetics committed to virtue and simplicity would not use yak tail whisks (D.I,7). Gods holding such whisks often flank images of the Buddha and bodhisattvas from ancient India.

Campaka. Yellow Jade Orchid Tree, *Michelia champaca*, Hindi *champa*, (Ja.V,420; VI,151). A shapely tree of medium height with smooth grey bark, large elliptical leaves and a creamy yellowish flower famous for its strong sweet perfume. The city of Campa in Aṅga, modern Bhagalpur, took its name from the tree and the commentary says that when the Buddha was

in the city he resided in a grove of *campaka* trees on the bank of Gaggarā's Lotus Lake (D.I,111). *Campaka* has a beautiful mottled wood from which camphor can be extracted as well as an oil used in making soaps and perfumes. See **Kappūra**.

Cāpalasuṇa. A type of pungent edible vegetable which monks and nuns were not allowed to eat (Vin.IV,259). The name means 'bow garlic'.

Ciñcā. Tamarind, Hindi *tinti*, *Tamarindus indica* (Ja.V,38). A large attractive semi-deciduous tree with small oblong leaves and a yellow flower splashed with red. The tamarind bears large irregularly curved pods containing a tart-tasting pulp in which are embedded large shiny seeds. The pulp is eaten and used in food preparation. The timber of the tamarind is hard and termite-resistant and the wood ash is used for tanning while the leaves, flowers and pods are used in dyeing.

Cittapātali. A type of flower (S.V,238).

Cittacūḷā Kacchapa. This is the personal name for a turtle in a Jātaka story and means 'Marked Crest' (Ja.VI,162-4). The name suggests that the character is meant to be a Chitra Turtle, also called the Indian Narrow-headed Softshell Turtle (*Chitra indica*). This turtle has a large round soft shell, olive or grey in colour, a long narrow head and eyes situated close to its comparatively short snout. The distinctive inverted chevron mark on its neck probably gave the turtle its Pāli name. This turtle is common in all Indian rivers including the Ganges, Yamuna and their tributaries where it feeds on fish and carrion. In ancient Indian cosmology, the four elephants that held up the world were believed to stand on the back of such a turtle. The *cittakadhara kumma* mentioned in the *Milindapañha* cannot be this creature because it was said to avoid going into the water (Mil.408).

Cittamiga. See **Citraka**.

Cittalatā. *Marsdenia tenacissima*, Hindi *chiti* (Ja.VI,278). A stout climber with velvety ovate leaves and green flowers. Fibre from this plant is very strong and is used to make bow strings and fishing lines.

Citraka. Spotted Deer, sometimes also *cittamiga* (Ja.VI,538), or *pasatamiga* (Ja.V,418), Hindi *cheetal*, *Axix axis*. This beautiful animal has a brown coat covered with lines of white spots. Both sexes are the same except that the male is slightly larger and has antlers. The animal's sharp 'ack ack ack' call often rings out from the forest fringes where it prefers to live. The spotted deer is India's most common deer and sometimes form herds of up to 50 or more animals. The Buddha said that 'geese, herons, elephants and spotted

deer are all frightened of the lion, regardless of the size of their bodies' (S. II, 279).

Cirīṭi. Possibly a generic name for parrots. However, it may also refer to the Yellow-throated Sparrow, Hindi *jangli chīria*, *Petronia xanthocollis*. The same size as the house sparrow, this bird is pale brown with chestnut shoulder patches, two white bars on its wings and a yellow throat. It lives in lightly forested country in the neighbourhood of villages and feeds on paddy left over after the harvest, grass seeds, berries, nectar and insects. The call of the yellow-throated sparrow is similar to that of the house sparrow but more pleasant. The tinkling of the ornaments in a woman's hair was said to resemble the chirping of the *cirīṭa* (Ja.V,202).

Cīnaka. Broomcorn, Hindi *china*, *Panicum milliaceum*. A erect, sparsely-branched type of millet growing wild but sometimes cultivated. Ascetics used to eat this grain (Ja.V,405; Sn.239). Broomcorn is eaten by the poor or fed to cattle.

Cīriṭikā. Cricket, Hindi *jhillika*, small slender jumping insect of the order *Orthoptera*. Crickets are nocturnal, similar in appearance to grasshoppers, with long antenna and ranging in colour from black to dark brown. About twelve species of cricket are found in northern India. The Buddha mentioned crickets chirping in the forest at night (A.III,397). In Sanskrit literature the Pāli equivalents of both *cīriṭikā* and *jhillika* are used for an insect that sings loudly in forests during hot summer days and probably refer to the cicada. Perhaps the Pāli and Sanskrit names were used interchangeably for both creatures.

Celakedu. Asian Paradise Flycatcher, sometimes *cetakedu*, *Terpsiphone paradisi* (Ja.VI,538). One of India's most beautiful birds, the adult male flycatcher is silvery white with a black crested head and two long ribbon-like tail feathers. The female is similar, only with a chestnut brown back and without the long tail. The paradise flycatcher is common in light forest and gardens where it feeds mainly on flying insects.

Celāvaka. A type of bird, sometimes also *celāpaka* (Ja.V,416; VI,538).

Coca. A fruit from which drinks were made (Ja.V,420; Vin.I,246). In other ancient Indian literature, the name is used for the fruit of *kadali*, *nālikera*, *panasa* and *tāla*.

Coraka. A plant used for making perfume (Ja.VI,537).

J

Jatu. Modern science uses the words gum, resin, sap, latex and mucilage very specifically according to the distinct properties of each. No similar distinctions can be detected between *ikkāsa*, *jatu*, *ojā* and *sajjulasa*, the names given in the Tipiṭaka for the substances extracted from or exuded by various plants. The four types of *jatu* mentioned are *hīngujatu*, *taka*, *takapattī* and *lakapaṇṇa* (Vin.I,201). The first of these came from the *hīngu* but the trees from which the others came are unknown. *Jatu* is also one of the medicines mentioned in the Vinaya, the others being tallow, roots, astringents decoctions, leaves, fruits, salts and ointments (Vin.I,251). *Ojā* means 'nutriment' and was sometimes used to mean tree sap. *Ikkāsa* had some adhesive properties because it would be mixed with whitewash to help it adhere to a surface (Vin.II,151). The sticky lime (*lepa*) used to trap birds and animals was apparently made from a type of resin or sap (S.V.148; Th.454). Today birdlime is made from the sap of *Cordia myxa*, *Ficus benghalensis*, *Ficus religiosa*, *Loranthus odoratus* and several other trees. The latex (*khīra*) found in certain plants was so called because of its resemblance to milk.

Jantu. See **Tiṇa**.

Jambu. Black Plum Tree, Hindi *jam*, *Eugenia jambolana* (Ja.II,160; V,6; S.V,237), a medium to large-sized tree with smooth grey bark, long leaves and a greenish-white flower which bears an oval dark purple fruit containing a single seed (Ja.IV,363). The black plum was said to be the finest tree in India and one of the ancient names for India was Jambudīpa, the Black Plum Land or Jambusaṇḍa, the Black Plum Grove (A.I,35; Sn.552; Th.822). Drinks were made out of the fruit (Vin.I,246). When he was a young man, Prince Siddhattha fell into a spontaneous meditative state while sitting at the foot of a *jambu* tree (M.I,246). While at Uruvelā the Buddha ate a *jambu* fruit which was 'full of colour, aroma and flavour' (Vin.I,30). According to the Jātakas, the Bodhisatta was once reborn as a spirit in a grove of *jambu* trees (Ja.II,438).

Jambuka. Indian Fox, Hindi *chamguhi*, *Vulpes bengalensis*. This dog-like animal has a greyish coat, brown ears fringed with black and a bushy tail tipped with black. The fox avoids thick jungle preferring scrub, open rocky country or grassland near human habitation (Ja.II,107; III,222-3). It is both

a hunter and a scavenger, eating small mammals and birds, domestic chickens and village rubbish.

Jayasumana. *Pentapetes phoenicea*, (Ja.V,163). A attractive medium-sized branched herb with sharply-toothed leaves and a large red flower. It grows in wet or soggy soil and the root has various medical properties.

Jalasuttī. See **Sippī**.

Jātisumanā. See **Sumanā**.

Jīñjuka. Indian Liquorice, Hindi *gumchi*, Maharashtra *gunja*, *Abrus precatorius* (Ja.IV,333), an attractive twining slender shrub, its leaves shiny on top and silky below, and with pinkish-white flowers. The smooth shiny seeds are scarlet with a black eye and in the *Tipiṭaka* are said to resemble a peacock's eye (Ja.IV,334). Liquorice seeds, called *guñja* or *raktikā* in Sanskrit, were used as the basic unit of weight in ancient India. The seed weighs 109 milligrams. It is also powdered and used in snuff, taken to relieve headache or used as a poison. The root is used in the same way as the liquorice root.

Jiraka. Black Cumin, Hindi *jeera*, *Nigella sativa* (Ja.II,363), an annual herb with long thin leaves and attractive pale-blue flowers. The pungent, aromatic seeds are powdered and used in curry and to flavour food. We read of meat being soured in a mixture of ground ginger, salt, cumin seeds and sour buttermilk (Ja.I,244). See **Kāra**.

Jīvaṃjīvaka. Pheasant-tailed Jacana, *Hydrophasianus chirurgus* (D.III,201; Ja.V,406; VI,276; 538). About half the size of the domestic hen, the jacana has a chocolate-brown body, white wings, a yellow strip on the side of its neck and a black 'necklace' on the upper breast. The toes are elongated for walking over lily leaves and floating vegetation. During the breeding season the male grows a long, slender sickle-shaped tail. The jacana is often seen singly or in large flocks in lakes and ponds and eats vegetation, insects and mollusks. It has a nasal mewing 'tewn tewn' call which, according to the commentary, sounded like 'Live! Live!' and gave the bird its name. The *Mahābhārata* describes the pheasant-tailed jacana as being 'red, yellow and brown'. In later Indian literature the *jīvaṃjīvaka* was mythologized into a two-headed bird.

Jhāpita. A type of animal (Ja.VI,537).

Jhāmaka. A type of plant (Ja.II,288; VI,537).

Ḍ

Ḍāka. Hindi *dhakki*, *Antidesma diandrum*. A large common shrub bearing rounded fruit ranging in colour from red to black and leaves which turn crimson before dropping off (Vin.I,246). The young leaves are boiled and eaten while the fruit is eaten raw.

T

Takkaḷā. A type of plant with a bulbous root (Ja.IV,46; 371).

Takkāri. *Sesbania aegyptiaca* (Thi.297). A large straight shrub with long leaves ending in a point and bearing lovely yellow, orange or red flowers.

Takkola. A sweet substance made from *Zizyphus oenoplia*, Hindi *kakoli*, a thorny evergreen shrub that climbs up against other trees and produces a small black edible berry. *Takkola* was chewed together with *tambūla* (Ja.I,291).

Tagara. Hindi *tagar*, *Tabernaemontana coronaria* (Dhp.54; It.68; Ja.IV,286; VI,173). A small attractive tree with dark green leaves and a beautiful pure white flower. The flower's perfume is imperceptible during the day but very noticeable at night. An incense was made from *tagara* flowers (It.68; Vin.I,203). The Buddha said: 'Of all fragrances - sandalwood, *tagara*, blue water lily and *vassika* - the fragrance of virtue is the best' (Dhp.55). The *tagara* is widely grown in gardens.

Tañḍula. The seed of the Rice Plant, Hindi *tandul*, *Oryza sativa*. Rice is a type of swamp grass and it was the main food crop in northern India during the Buddha's time. There are thought to be as many as 200,000 varieties of rice in India today. The *Shunya Purāṇa* mentions 50 varieties while the Tipiṭaka mentions about nine, although only one of them can be identified with those known today. *Daddula* was an inferior type (A.I,241; D.I,166; M.I,78; 156) while *nīvāra* was, according to Pāṇini, a low quality wild rice (D.I,166). *Pavihi* (J.V,405) and *vīhi* (Th.381) were common varieties while *sāli* was considered the best type (A.I,8; 32; 325; III,49; IV,231; D.I,105; Ja.I,327). *Sāli* was probably an earlier variety of the famous *mahāsāli* often praised in ancient sources. The Chinese pilgrim Xuanzang was given this rice when he was in India in the 7th century. He wrote: 'This rice is as large as a black bean and when cooked is aromatic and shining, like no other type of rice. It grows in Magadha and nowhere else.' According to Pāṇini, *sāli* was grown in the winter and *vīhi* in the summer. The whiter the grains of *sāli*, the finer it was considered to be (Ja.VI,516). The rich ate *sāli* and meat but fed their slaves and servants broken rice and sour gruel (A.I,145). *Sāliyavaka* (Ja.IV,172) was, according to both Pāṇini and the *Carakasamhitā*, the name of a variety of rice. Wild or self-sown

rice, *sayañjātasāli*, is also sometimes mentioned (Ja.I,325). One wild variety was called *sūkarasāli*, pig's rice (Ja.VI,531).

Being the main staple in northern India, the Tipiṭaka contains much information about the cultivation of rice. Paddy fields were square or rectangular and had embankments around them (Ja.IV,167). A good paddy field had to be level, have deep fertile soil, a reliable water supply, an inlet and outlet for the water and sturdy embankments around it (A.IV,237; Vin.II,180). There is mention of paddy fields being near ponds or lakes, either natural or man-made, or of them being situated near rivers (A.III,26; J.III,293; IV,167; V,35), and we read of hollow tree trunks being used as irrigation pipes (A.IV,170). Farmers would indicate which fields were theirs with marker stones (Ja.IV,281). To get a good yield the seed had to be unbroken, capable of sprouting and then well-watered (A.I,135). It was believed that rice seeds would absorb the essence of the earth and water and that this would determine its taste (A.V,212-3). Some of the implements used in agriculture, including rice cultivation, are mentioned in the Tipiṭaka, including the plough (*naṅgola*) with its iron-tipped ploughshare (*phāla*), the hoe or spade (*kudḍāla*), the sickle or grass cutter (*tiṅalāyana*) and a tool sometimes translated as a weeding hook (*niddāna*, A.I,204; Ja.V,45; Sn.77-8). A ceremony called *vappamaṅgala* was conducted just before the first plowing in the belief that it would guarantee a good harvest (Ja.I,57; IV,167).

The growing rice had to be protected from cattle straying into it and from wild birds and animals eating it. Field watchers (*khettagopaka*), those employed to watch the paddy fields as the crop ripened, would be fined to the amount of any of the crop that was eaten by birds or deer (Ja.IV,278). The ripening crop was sometimes attacked by a disease called *setaṭṭika* (A.III,52; IV,278). Several texts describe the process of harvesting in detail (A.I,241-2; Vin.II,180-1). It consisted of reaping the rice, gathering it up and putting it in piles (sheaves or stooks, *kalāpin*) to dry. To thresh it, cattle were driven over the stalks or they were beaten with flails (S.IV,201). The winnowing was done by dropping the grain from a height and allowing the wind to separate the grain from the chaff. The harvesters would take care to keep the grain and the chaff separate and use a broom to sweep them apart (A.IV,170). Alternatively, winnowing baskets shaped like an elephant's ear were used to fan the grain from the chaff and then to remove grit (Ud.68). There were three steps in winnowing; first the straw was removed, then the chaff and finally the grain was sifted (Vin.II,181). After the harvest the rice was stored in a granary (Vin.I,240) and every now and then, it would be taken out to be aired (Ja.I,484; Vin.I,211). Royal palaces had their granaries too. The Jātaka describes the master of the royal granaries (*doṇamāpaka*) sitting at the granary entrance and measuring the rice peasants brought as the king's share. He placed a

marker on each heap as it was measured so as to keep track of who had brought what amount (Ja.II,378).

In the Vinaya the Sakyan Mahānāma characterized the farmer's life as a dreary and endless round of plowing and sowing, weeding and harvesting: 'Having brought in (the crop), exactly the same has to be done next year and exactly the same the year after that. The tasks never stop, no end to the tasks can be seen'(Vin.II,181).

Plain boiled rice was called *odana* or *bhatta* and was usually eaten with various curries and condiments (A.IV,231). The rich would have the blackened grains removed from their rice while the poor might be reduced to eating even the scum formed by cooking rice (A.I,241; Ja.II,289). Bran, (*kaṇa*, *kukkusa* or *kuṇḍaka*), the brown covering of grains removed during polishing or milling, was considered the most humble of foods and was made into cakes and gruel (D.I,166; Ja.I,423). People considered milled and polished white rice to be superior to unmilled brown rice. A guest in the Jātaka noticed that at the beginning of his stay his host served him white rice but as time progressed it became brown, indicating that he had overstayed his welcome (Ja.V,233; VI,16).

Rice was sometimes cooked together with sesame seeds (Ja.III,425). *Kaṇājaka* was a porridge made from the broken grains that had been removed while cleaning the rice (Ja.V,230). A porridge of rice boiled in milk was called *khīrodana* (Vv.33,24) or *pāyāsa* (J.IV.391; S.I,166). An idiom said that a loving couple were as inseparable as ghee mixed into *pāyāsa*, which must have been another way of serving this porridge (Ja.I,457). A feature of various auspicious occasions was to scatter grains of popped rice (*lāja*) together with flower petals of different colours (Ja.II,240; VI.42). A confectionary called *madulāja* was made of balls of popped rice held together with honey or molasses (IV,214; 281). A gruel called *yāgu* (A.III,49; D.I,76) was probably made as it is today by boiling rice in water to a thin consistency and adding salt, a garlic clove and a few pepper corns. The Buddha said there were five benefits of this rice gruel: it dispels hunger, quenches thirst, regulates wind, cleanses the bowels and helps digest the remnants of food (A.III,250). Another type of gruel was called *bilanga* (Vin.II,77).

A type of alcoholic beverage was prepared from cooked rice with yeast added (Vin.IV,110). A preparation called *thālīpāka* was made, according to the *Gṛhya Sūtra*, of either rice or barley cooked with either milk or water and was used as an offering to the gods. After being offered this food was eaten (A.I,166; D.I,97; S.II,242). The *Nidānakathā* gives the recipe for a rice dish called *gavapāna*. To make it, one would boil milk until it thickened, added rice a little at a time, then added a cooked mixture of honey, palm sugar, flour and ghee and then let it simmer until the rice was soft (Ja.I,33). In several places in the Tipiṭaka women are dismissed as

having a 'two-fingered wit' (S.I,129). According to the commentary, this refers to the housewives' habit of squeezing grains of boiling rice between the thumb and first finger to see if it is cooked. See **Pasādiyā**.

Tamāla. Indian Cassia, Hindi *tejpat*, *Cinnamomum tamala* (Pv.35,5. A medium-sized straight tree with shiny oblong leaves and a small cream-coloured flower. The bark of this tree produces an inferior cinnamon now rarely used, and the leaves have medicinal properties. The *Mahāvastu* mentions the use of a perfumed powder made from the leaves of Indian cassia (Mv.II,15).

Tambakipillika. The name means 'copper-coloured ant' and refers to the Red Weaver Ant, *Oecophylla smaragdina*. This common large red or rusty-coloured ant lives in trees where it makes its nest by weaving leaves together (Ja.IV,375; Vin.III,51) and feeds on flies, moths, beetles and caterpillars. It is an aggressive ant, sinking its large mandibles into any intruder and squirting it with formic acid from a gland at the base of its abdomen. One Jātaka story describes a mass of dry twigs, leaves and red weaver ants falling out of a sal tree onto an elephant (Ja.V,39). See **Kunthakipillaka**.

Tambūla. Betel Vine, sometimes *nāga*, *Piper betle* (Ja.I,266; 291). A deciduous creeper with a semi-woody stem and shiny green heart-shaped leaves. Combined with lime, various spices and the nut of the betel palm, this leaf is chewed as a mild stimulant. The leaves and nuts were kept in a little bag (Ja.VI,367). The Jātakas mentions a tooth-stick made from a twig of the Betel Vine (Ja.I,232; IV,363; V,156) and of the leaves being chewed together with *takkola*. See **Nimba** and **Pūga**.

Taraccha. Striped Hyena, Hindi *taras*, *Hyaena hyaena* (A.III,101; Ja.V,416). An ungainly sulking canine with long ears, a sloping back with a light grey body with black stripes and a black chest. Hyenas have an eerie laughing call ending in a cackle and live in scrub and around villages where they scavenge. Although thought of as scavengers they are also effective predators. Forest dwelling monks were sometimes attacked by hyenas and they were not allowed to eat hyena flesh (Vin.I,220).

Tāla. Palmyra Palm, sometimes *tālataruṇa*, Hindi *tad*, *Borassus flabellifer* (D.II,171; 182; M.I,187; Vin.I,189), a tall unbranched palm having large fan-like leaves with thorns on the margins of the stalks. The round yellow fruit appears in large bunches. The leaves of the palmyra were used to make huts, fans, sunshades and various household articles (Th.127). The sap of the male flower was used to make an alcoholic beverage called *jalogi*.

Whether or not it was allowable for monks and nuns to drink unfermented *jalogi* was discussed at the Second Buddhist Council (Vin.II,301). When reduced by boiling, this sap was also made a gritty brown sugar which was called *sakkharā* (Ja.I,251; 348). The Buddha often describes the enlightened person's destruction of the defilements to a palmyra trunk which, unlike many other trees, will not grow again after it is cut down (A.I,137). Hatred, he said, should be separated from the mind with the ease that a palmyra fruit separates from the stalk (It.84). The Buddha's radiant complexion was compared to the translucent yellow fruit from the palmyra palm just loosened from the stalk (A.I,181). The height of the tree was used as a rough unit of measurement. Something of significant height was said to be as high as seven Palmyra palms (D.III,27). See **Kiṇṇa**.

Tāḷisa. Indian Plum or Coffee Plum, *Flacourtia jangomas*, sometimes *tāḷissa* (Ja.IV,286). A small erect tree with a blue-green flower. When young the trunk is covered with very long thorns while older trees have smooth pale bark. The tree is cultivated for its pleasant-tasting plum. The Buddha recommended a medicine made from this tree, probably from the plum (Vin.I,203).

Tikaṇṭaki. Identity uncertain. The Pāḷi name means 'three thorns'. The only plants that would fit this name and also grow in northern India are *Tribulus terrestris* and *Barleria lupulina*. The first, commonly called Goathead or Devil's Thorn, is a small annual growing close to the ground. The plant's hard woody seeds have two, three or four spines and make walking wherever it grows a considerable nuisance. It is considered a noxious weed. A more likely candidate for *tikaṇṭaki* is the Hophead, *Barleria lupulina*, a small erect shrub with reddish-brown branches, dark green leaves and attractive yellow flowers growing from upright spikes. Needle-like thorns, usually three but sometimes two or four, project from where the leaves meet the stem.

There was a park called Tikaṇṭakavana near Sāketa where the Buddha used to stay when visiting the town (A.III,169).

Ṭiṇa. Grass, also *saddala* (A.I,145; D.II,19). Grasses are variable and widespread plants of the family *Gramineae*. More than a dozen species of grass are mentioned in the Tipiṭaka. The Buddha said that a monk or nun should not steal anything, not even a blade of grass (Vin.I,96). Various useful items were made out of grass. We read of grass mats (Vin.I,286) and of houses being thatched with grass (A.I,101; Vin.II,148). Growing amongst the crops, grass becomes a weed and a curse (Dhp.358). There is mention of whole jungles of grass (A.I,153; S.II,152) which sometimes caught fire so that many creatures died (S.II,152). This probably refers to the Terai-Duar

grasslands ecoregion on the northern edge of the Ganges plain. The Buddha required his monks and nuns to stay put during the monsoon so that they would not tread down crops and grass and injure the tiny creatures that lived among them (Vin.I,137).

The Buddha mentioned that on retiring to the forest for meditation he would gather grass and leaves for a seat to sit on. (A.I,182). On one occasion a Brahmin had prepared a bed of grass for the Buddha to sleep on in his fire hall. When the ascetic Māgandiya saw this he commented disapprovingly to the Brahmin: 'It is a sorry sight indeed when we see the bed of the Master Gotama, that destroyer or growth' (M.I,502). Perhaps Māgandiya belonged to a sect that considered even cutting plants to qualify as killing. Several of species of grass mentioned in the Tipiṭaka which cannot be identified include *jantu*, a pale-coloured grass (Vin.I,196), *poṭakila*, a soft grass (Ja.VI,508; Th.27; Vin.II,150) and *kamala*, a grass used to make sandals (Vin.I,190). Other types of grass were *tiriyā* (A.III,240) and *eragu* (Vin.I,196).

Tiṇahamṣa. A type of water bird (Ja.V,356). The name means 'grass goose' or 'grass duck'.

Tittakalābu. Bitter Gourd, *Momordica charantia*. A common slender climber covered with velvety hairs and with a yellow flower. The fruit is long and thin, ribbed, tapering to a point at both ends and yellow when ripe. It is also extremely bitter but is eaten in the belief that it is good for the health. The Buddha mentioned the seeds of this plant along with those of the *nimba* and the *kosātakī* as being very bitter (A.I,31). He said that the doctrines of some of the other teachers of the time were like a concoction of bitter gourd and poison, unpleasant now and with unpleasant consequences later (M.I,315). He also mentioned that when he was practising austerities before his enlightenment he became so emaciated that his scalp looked like a bitter gourd withered by the sun (M.I,80).

Tittira. Chestnut-bellied Sand Grouse, sometimes also *daddara*, Hindi *bhat teetar*, *Pterocles exustus* (Ja.I,218; III,537), small yellowish-brown ground bird with a thin black stripe across its breast and brownish-black belly. Hunters would catch one sand grouse and then train it to lure others into traps (Ja.III,65). According to the Jātakas, the Bodhisatta was once reborn as one of these birds (Ja.I,218).

Tinduka. Indian Persimmon, *Diospyros embryopteris*, sometimes also *tiṇḍuka* or *timbuka*, Hindi *tindu* (Ja.V,99; VI,93). A medium-sized evergreen tree with spreading branches sometimes reaching almost to the ground, a fragrant white flower and globose fruit covered with soft red velvety hair.

An oil extracted from the seeds is used to treat dysentery. Queen Mallikā built a debating hall near a prominent *tiṇḍuka* tree in a park at Sāvattḥī (D.I,178). We read of villagers building a bamboo fence around one of these trees to stop the monkeys from eating the fruit (Ja.II,76). A torch of *tiṇḍuka* wood, if struck, hisses, sputters and gives off sparks (A.I,127).

Tipusa. See **Kakkarāka**.

Timi. A large marine animal, probably mythological, other types being *ānandamaccha*, *timanda*, *timīṅgala*, *timitimīṅgala* and *timirapiṅgala* (A.IV,200; Ja.I,207; IV,278; V,462; Ud.54). Seventeen species of whales and also the dugong swim in Indian waters and are occasionally washed up on beaches. It was probably reports of such creatures by fishermen and seafarers that gave rise to stories about sea monsters. It was said of these creatures that they were huge and that they 'draw in and blow out great gulps of water' (Mil.262). The Tamil, Telegu and Malayalam word for whale is *thimīṅgilam* and the Kannada word is *thimīṅgila*. See **Susukā**.

Timira. Oriya *tinia*, *Albizzia odoratissima* (Ja.III,189). A attractive tree with drooping branches, purplish-green pods that turn red when ripe and small white flowers.

Timbaru. Sometimes also *timbara*, Hindi *tendu*, *Diospyros montana* (Vin. III,59; Vv.33,27). A small to medium-sized tree with smooth reddish or greenish bark, stout conical thorns and green or yellow flowers. The fruit, which is globose and slightly oblong and with a conical tip, is greenish-yellow, gradually turning black. Probably repeating a common comparison, the Buddha observed that the breasts of young women are like the *timbaru* fruit (Sn.110). We read of a woman winding a ball of cotton yarn on a *timbaru* pip (Ja.VI,336).

Timbarūsaka. A type of tree, perhaps the same as *timbaru* (Vin.III,59; Vv.33,27). The word means 'little *timbaru*.'

Tiriya. A type of grass. In one of the series of five dreams the Buddha had before his enlightenment, *tiriya* grass sprouted from his navel and grew until it reached the clouds (A.III,240). The *Mahāvastu* calls this grass *kṣīrikā*, a name suggesting that it had a milky (*kṣīra*) sap (Mv.II,137).

Tirivaccha. A type of tree (Ja.V,46).

Tiriṭi. *Symplocos racemosa*, sometimes *tiriṭaka* (A.I,240; II,206; D.I,166). A small tree with a white flower and a rough bark which is used to make a

dark brownish-red dye. Ascetics dyed their robes with this bark (Vin.I,30). See **Rukkha**.

Tila. Sesame, Hindi *til*, *Sesamum indicum* (A.I,130; Ja.I,67; Vin.I,212). A small erect annual whose numerous tiny seeds yield an edible oil. Sesame was considered an essential food along with rice, beans, cereals, butter, sugar and salt (A.IV,108). Before being stored, sesame seeds were washed and dried in the sun (Vv-a.10). Rice was cooked with sesame (J.III,425), the seeds were ground into a paste (Vin.I,205) or made into cakes (Vv-a.33) and the oil was drunk or used in cooking. A gruel of sesame, rice and Green Gram was given as a medicine (Vin.I,210). When the Bodhisatta was practising austerities one of the things he ate was *piññāka*, the pulp left after the oil had been extracted from sesame seeds (M.I,78). Sesame fields could be struck with a blight leaving the plants with only one or two leaves on them (S.I,170). Oil from sesame and other seeds was extracted in a mill consisting of a large stone wheel that creaked as it turned (Bv.2,168). To extract the oil, sesame meal would be sprinkled with water and then pressed (M.III,142). A pimple or freckle was called *tilaka* for its resemblance to a sesame seed (M.I,88). The Buddha mentioned that a border fortress would be supplied with fuel and food, including sesame, presumably to feed the inmates and to use when under siege (A.IV,108). Some monks once asked the Buddha how long the lifespan of beings in the Paduma Purgatory was. He replied: 'Imagine a Kosalan cart filled with twenty measures of sesame seeds and imagine that once every century one seed was removed from it. That cart would be empty sooner than the time in purgatory would be over.' (A.V,173).

Tilaka. *Flacourtia cataphracta*, (Vv.7,8). A small erect tree with long thorns on its trunk and pale brown flowers. The tree grows wild but is also cultivated for its fruit, a small round purple plum with a pleasantly tart taste.

Turī. What this name refers to is very uncertain. The nun Subhā said her eyes were like those of a *turī* (Thi.381) which suggests it might be a deer, as ancient Indians often compared women's eyes to those of a doe. However, the commentary says the name refers to a species of bird. On the other hand, Turī was the name of the wife of the god Vāsudeva.

Tulasi. Basil, sometimes *sulasī*, Hindi *tulsi*, *Ocimum sanctum* (Ja.V,46; VI,536; Vin.IV,35). A small many-branched herb with leaves covered with down and which grows throughout India. When crushed, the leaves have a pungent smell and taste and are chewed as a mouth freshener or an appetizer. Two other common species of basil are *Ocimum gratissimum* and

Ocimum basilicum. Hindus consider Basil sacred to the family and the more religious will always have a bush growing somewhere near the house. When boiled, the leaves give a bright yellow oil which has antibacterial and insecticidal properties.

Tuliya. Indian Flying Fox, *Pteropus giganteus* (Ja. VI,537), an animal with a chestnut-brown coat, black ears and large black wings that are wrapped around its body when roosting, which it does by hanging upside down in trees. This flying fox eats fruit and is found all over India. The commentaries give the flying fox the alternative name of 'tree dog' and say it has the colour of a reed flower.

Tūla. Down from either trees, creepers or grasses (Vin.II,150). It was used to stuff quilt blankets, pillows and mattresses.

Tūlinī. A type of tree (M.I,128).

D

Daṇḍapaduma. A type of plant. The name means ‘stick lotus’(Ja.I,51).

Daṇḍamānavaka. This compound means ‘little stick man’ and was the name given to a particular type of bird, possibly a crane or stork (D.III,202). Brahmins who had been presented with a staff at their investiture ceremony were called ‘stick man’. The north Indian bird with the most stick-like legs is the Black-necked Stork, *Ephippiorhynchus asiaticus*, a large bird with a black head, neck and back, white wings and belly, long bright red legs and a massive black beak. Solitary birds are often seen in marshes and shallow ponds where they eat fish, crustaceans and frogs. Sanskrit literature mentions a bird named *koyaṣṭi*, meaning ‘stick-like legs’ which may refer to lapwings. See **Dindibha**.

Daddara. See **Tittira**.

Daddula. See **Taṇḍula**.

Dabba. A type of grass (A.II,207; Th.27), sometimes also *dabbha*. *Dabba* and *kusa* are often thought to be different names for the same plant but the ancient commentary on *Suśrutasaṃhitā* makes a clear distinction between the two, saying: ‘*Kuṣa* is short and soft and has leaves like a needle while *darbha* has leaves which are broad, long and rough.’ Apparently *dabba* was a tough grass that could be twined together to make ropes. The Buddha said: ‘The wise say that the strongest fetters are not made of iron, wood or *dabba*, but of the longing for jewelery, of precious stones, offspring and wives.’ (Dhp.345). The *Buddhacarita* mentions the sharp edges of *dabba* leaves (Bc.6,28).

Dālikā. Pomegranate, sometimes *dālīma*, *dāḍīma* or *dālīma*, Hindi *dalima*, *Punica granatum* (Thi.297). The pomegranate is a medium-sized climbing shrub with small leaves, thorny branches and a fleshy red flower. The fruit has a woody rind and separate compartments containing numerous seeds encased in a semi-transparent pink or red flesh.

Dāsima. A type of plant (Ja.VI,536).

Dindibha. One or another of the four species of lapwing found in northern India, probably the Red-wattled Lapwing, Hindi *titeeri* or *titi*,

Vanellus indicus (Ja.VI,538), known as *tittibha* in Sanskrit. This large plover is brown above, white below, with black breast, head and neck and a white band running from the eyes down the side of the neck to the breast. It also has a bright red wattle in front of each eye. The lapwing is commonly seen in fields, open country and near water, running in short bursts as it hunts for food. At the slightest intrusion or sign of danger it makes a loud piercing 'did he do it' call becoming increasingly frantic until the danger or the intruder passes. See **Danḍamānavaka**.

Dīpi. Leopard, sometimes also *dīpika* or *saddūla*, Hindi *sadul*, Gujarati *dipdo*, *Panthera pardus* (A.III,101; J.I,132; II,44; VI,538). This large cat has a yellow coat marked with black rosettes and a white underside. Nocturnal and solitary by habit, leopards live in thick jungle and lurk around villages where they prey on livestock and sometimes kill and even eat humans. Black leopards, called panthers in English, are sometimes born in the same litter with the normal spotted ones. The monk Tālaputa described himself as living in a forest grove 'resounding with the cries of peacocks and herons and favoured by leopards and tigers' (Th.1113). Royal chariots were upholstered with leopard or tiger skins (Ja.VI,503). Leopards are now almost extinct in northern India. See **Kālasīha**.

Dukūla. A type of plant, the fibres of which were used to make a fine cloth (A.IV,393; Ja.II,21; S.III,146).

Deḍḍubha. A water snake described as small, harmless, with a large head and a needle-like tail (Ja.I,361; III,16; VI,194). This could be the Buff-striped Keelback, *Amphiesma stolata*. This little snake has a relatively short body and a long thin tail, almost a quarter of its total length, large eyes and is usually olive-brown with buff stripes around its body. A common snake, it is often seen along river banks and in marshy areas where it feeds almost exclusively on frogs and toads. The keelback is described as 'a remarkably inoffensive and gentle little snake'. When alarmed, rather than fleeing, it curls up, flattens its body and distends itself by deep inhalations.

Dviguṇapalāsa. A type of tree (Ja.VI,365). The name means 'double *palāsa*'.

Dhañka. See **Kāka**.

Dhañña. Grain. Grains are the seeds of various cereal grasses. The seven types of grain usually mentioned in the Tipiṭaka are *sāli*, *vihi*, *yava*, *godhūma*, *kaṅgu*, *varaka* and *kudrūsa* (Vin.IV,265). Elsewhere, the first two of these are included in a list of edible seeds (M.I,57). Grains like wheat

and barley have a awn (*sāka*) at the end of the husk. Sometimes rice or barley was cooked and then dried, probably to preserve it. Once, during a famine, some monks were given such food which was meant to feed horses. They pounded it in a mortar and then ate it (Vin.III,6). During various auspicious occasions grains of popped rice or wheat (*lāja*) together with flower petals of different colours would be scattered (Ja.II,240; VI,42). Small balls of popped rice held together with honey or molasses (*madulāja*) were a popular sweet as they still are today (Ja.III,539; IV,281). In a ritual called *saddha*, done for the benefit of departed ancestors, small balls of either rice or wheat dough called *piṇḍiṇ* were used (A.I,166; V,269). Grain merchants had a reputation for mixing chaff with the grain they sold (Ja.VI,110). The Jātakas advise the prudent man: 'Regularly visiting the threshing floor, the barn, the herds and the fields he should have grain carefully measured and stored in granaries, and have it carefully measured and cooked at home' (Ja.VI,297). See **Aparaṇṇa**, **Godhūma**, **Kaṅgu**, **Nīvāra**, **Taṇḍula** and **Yava**.

Dhanukārika. A type of plant (Ja.V,420).

Dhanutakkāri. Thorn Apple, Hindi *datūra*, *Datura stramonium*, (Ja.VI,535). A annual shrub with a purplish stem, zig-zag branches and white or purple flowers. The seed pods are covered with very sharp spines.

Dhanupāṭali. A type of tree (J.V,422). The name means 'bow trumpet tree'.

Dharaṇīruha. A type of tree (Ja.VI,497).

Dhava. *Anogeissus latifolia*, Hindi *dhaura*. A common deciduous medium-sized to large tree with whitish bark and broadly elliptic leaves and which grows on dry ridges and hills (Ja.VI,528). It has a very straight trunk and is prized for its timber. The Buddha mentioned it along with *sāla* and *phandana* as being the type of tree people would clear of parasitic creepers, presumably because of its usefulness (A.I,202). Its timber was not suitable for making wheels (Ja.IV,209).

N

Nakula. Grey Mongoose, *Herpestes edwardsii*, the most common of the three species of mongoose found in northern India. An alert creature with an elongated body, short legs and tawny grey fur, the mongoose is famous for eating snakes although it also hunts birds, rats and insects. Mongooses were captured and trained to fight snakes for entertainment or to find and kill those that invaded homes. They are a cautious creature and go stealthily when they see humans (A.V,289). Indians have long believed that before hunting snakes mongooses eat certain herbs as an antidote against venom. Nāgasena said: 'As a mongoose approaches a snake to seize it only after having supplied its own body with medicine, so too the meditator, the earnest student of meditation, on approaching this world abounding as it is in anger and malice, plagued by quarrels, strife, contention and hatred, must anoint his mind with the medicine of love' (Mil.394). Today, mongooses are said to eat the leaves of *Ophiorrhiza mungos* as an antidote. According to the Jātakas, the Bodhisatta once brought a mongoose and a snake together as friends by teaching them about peace and unity (Ja.II,53) and in another life he became a mongoose trainer (Ja.IV,389).

Najjuha. A type of bird (Ja.VI,528; 538).

Nattamāla. Fever Nut, Hindi *naktamala*, *Caesalpinia crista* (Vin.I,201). A extensive climbing shrub covered with prickles, compound leaves and pale yellow flowers. The bark and leaves and the oil extracted from seed all have medicinal value. The fever nut is often grown as a hedge.
Kālānusārī, see **Narada**.

Narada. Spikenard, sometimes also *mamsi*, Hindi *nalab*, *Nardostachys grandiflora* (Ja.VI,537). A erect perennial herb with elongated spatulate leaves and a rosy-pink or sometimes blue flower. The whole plant has a distinct lingering smell but the stout black-coloured rhizome in particular gives off a sweet spicy fragrance. The Buddha referred to the root as *kālānusārī* and considered it to be the sweetest of all root fragrances (A.V,22) and also to be a useful medicine. An amber or sometimes greenish oil is extracted from the root by steam distillation. Both the whole root and the oil are widely used in medicines, perfumes and to make incense. Spikenard grows on the southern side of the Himalayas between 3500 and 4500 metres and is usually collected from the wild, although occasionally

cultivated. Historical records show that spikenard made its way by trade as far as Egypt in ancient times.

Nāḷa. A general term for reeds and rushes, grasses that grow in or near water (D.III,75). Numerous types of reeds and rushes grow in northern India but few of them can be identified with the ones mentioned in the *Tipiṭaka*. A special caste of people harvested certain reeds and rushes (D.I,51). They would cut the stalks, grasp them, shake them up and down, throw them aside and then cut more (S.III,155). After this, the stalks would be tied into sheaves (S.II,114). The Buddha said: 'By hankering for the future and pining for the past, fools dry up and wither away like a green reed that has been cut' (S.I,5). Numerous household articles were made out of reeds and rushes, such as sandals, stools (Vin.IV,39), baskets and mats. They were also used to make small huts (S.I,156; IV,185), to thatch the roofs of houses and in the wattle-and-daub construction of walls (Ja.IV,318). In the *Jātaka*, there is a story about merchants who sail to a sea called *Nāḷamala* which looked like a vast expanse of reeds (Ja.IV,140). This almost certainly refers to the Shatt-al-arab below the confluence of the Tigris and Euphrates Rivers in Iraq. *Isikā* (D.I,77; M.II,17), *kaṭṭhaka* (Dhp.164) and *pabbaja* (Th.27; 233; Vin.I,190; S.I,77) were all different types of reeds. *Santha* was a reed or cane used to make bow strings (M.I,429) and *saravana* a reed with sharp leaves used to make arrow shafts (S.IV,198).

Nāḷaka. Hindi *nal*, *Phragmites karka*. A tall grass with close-jointed stems and which commonly grow along river banks. The stems were used as needle cases (Ja.I,172) and are now widely used to make stools, mats, baskets, winnowing baskets and fish traps.

Nāḷapi. A type of aquatic animal (Ja.VI,537).

Nāga.¹ Iron-Wood Tree, Hindi *nagkesar*, *Mesua ferrea* (Ja.I,35,80). A large evergreen tree with narrow pointed leaves, bright red and shiny when new, and which produces a large fragrant four-petaled white flower. The flower is referred to as *nāgamālika* (Ja.VI,269) or *nāgapuppha* (Mil.283) and even when dried retains their fragrance. When the iron-wood tree is in bloom on a Himalayan mountain, and when the gentle breezes are blowing, they waft the fragrance of the flowers for ten or 20 *yojana* (Mil.283). According to Hinduism, the arrows of Kāma, the god of sensual love, are tipped with these flowers. The tree gets its English name from the exceptionally hard timber which is used for building.

Nāga.² Cobra, Hindi *nag*, large snakes of the family *Elapidae* which are capable of flattening the long ribs in their necks into a hood when threatened. There are three species of cobra found in northern India. When referring to the cobra the common words for snakes, *āsīvisa*

(Ja.II,274), *sappa* (Ja.VI,6) and *uraga* (Ja.VI,166) are used together with the comment that it has a hood, suggesting that the cobra was also known as 'the hooded snake'.

Snake charmers were a feature of street life in cities and towns (Ja.III,198) and they usually used cobras because of their impressive appearance, their ability to stand erect and their tendency to follow and therefore appear to dance to the moving flute played by the charmer. These charmers were believed to use special herbs and magic spells to mesmerize cobras in order to attract and then catch them. They would approach the snake, seize it by the tail, drag it backwards so that it would be stretched out full length and then use what was called a 'goat's foot stick' to pin its head down. Seizing it by the head and applying pressure to the sides would force the cobra's mouth open so the charmer could spit the juice of certain herbs into it which would, it was believed, break its fangs. Over the next few days the cobra would be subjected to a series of procedures meant to pacify it and get it used to being handled. These procedures were called *cunnamāna*, *tantamajjita* and *dussapoṭhima* and seem to have involved wrapping the cobra in cloth and then stretching, squeezing, massaging and striking it. After this the cobra was ready to be used (Ja.IV,457). During their performances, charmers would make cobras dance and drape them around their necks (Ja.I,370). They would feed them with frogs they had killed (Ja.IV,458). The species of cobra favoured by charmers has always been the nocturnal Indian Cobra, *Naja naja*, because daylight hampers its ability to strike. See **Kaṇhasappa** and **Sappa**.

Nāgalatā. Uncertain, but perhaps the same as *tambūla* (Ja.I,80). The name means 'snake creeper'.

Nāgavallika. Uncertain, but perhaps the same as *tambūla* (Ja.VI,536). The name means 'snake vine.'

Nādiya. *Vitis assamica*, a common creeper with shiny leaves and which produces edible succulent black berries (Ja.VI,536).

Nāmaka. A type of bird (Ja.VI,538).

Nāḷikera. Coconut Palm, also called *nārikera*, Hindi *nariyal*, *Coco nucifera* (Ja.IV,159, V,384). A tall unbranched palm with large pinnate leaves. The woody flower ranges in colour from creamy white to bright yellow and produces large oval fruits in which is a round nut with a white edible kernel. Coconut palms are of enormous economic importance, producing oil, copra, fibre and timber.

Nimka. A type of animal (Ja.VI,277).

Niggunḍi. Oriya *nirgundi*, *Vitex negundo* (Ja.VI,535). A large shrub with a distinct smell, leaves covered with fine hair and white or sometimes lavender flowers. The *niggunḍi* is common on waste ground and on the outskirts of villages. The *Visuddhimagga* says the flower is blue (Vism.257).

Nigrodha. Banyan Tree, Hindi *nyagrodh*, *Ficus benghalensis*. This large evergreen tree has a red fruit and produces aerial roots which support the ever-spreading branches, (Ja.VI,14; S.I,207). The banyan is famous for growing up against other trees and eventually strangling them. The Jātaka describes a bird eating banyan figs, later dropping its excrement in the fork of a flame of the forest tree where the banyan seeds germinated, put forth red shoots and foliage and eventually strangled the tree (Ja.III,208). The Buddha said that craving is like the trunk of the banyan that clings to and eventually envelops the things it comes into contact with (S.I,207). He also said that passions come to oneself just as the aerial roots (*khandahaya*) of the banyan emerge from the branches (Sn.272). The figs, which are red and grow on the branches, could be as sweet as sugar (Ja.III,110).

During the Buddha's stay at Bodh Gaya, he spent seven days sitting at the foot of the Goatherd's Banyan Tree (Ud.3). Once, he compared the kind, generous and believing lay man to a banyan tree: 'Just as in some pleasant countryside where four roads meet the great banyan tree is a haven of rest for all the birds; even so the believing lay man is a haven of rest for many, for monks and nuns, for lay men and lay women' (A.III,42-3). A popular place near Kapilavasthu, the Buddha's hometown, was the Banyan Park, perhaps named after a large banyan tree that grew there (A.V,83). People would make vows before banyan trees, offering them flowers and perfume, watering them and reverently walking around them and hence their alternative name 'Vow Tree' (*vararukkha*, Ja.I,259). One of the 32 characteristics of the Mahāpurisa's body is that it has the proportions of a banyan tree, i.e. the length of his arm is equal to his height (D.II,18). The previous Buddha Kassapa was enlightened under a banyan tree (D.II,4).

Banyan is an English word derived from the Gujarati *banyan*, 'a merchant', Pāli *vāṇija*. The first English travellers in India noticed that itinerant merchants would often spread out their wares under the local village banyan tree.

Nimba. Neem Tree, sometimes *pucimanda*, Hindi *neem*, *Azadirachta indica* (A.I,32, V,212; Ja.IV,205). A large deciduous tree the leaves of which have an extremely bitter taste and medicinal and insecticidal properties. It was believed that a mango tree growing next to a neem would give bitter

fruit as a result (Ja.II,105). Neem produces a hard durable timber and stakes made from the wood were used to impale criminals (Ja.III,34). An extract from the leaves was used as medicine (Vin.I,201).

In India today, country folk use neem twigs to clean their teeth in the morning, chewing the twig until it frays and then rubbing it up and down over their teeth. The Buddha recommended using a tooth-stick because it keeps the eyes clear, purifies the sinuses, sweetens the breath, cleans the taste buds, prevents phlegm and mucus getting in the food and makes food more tasty (A.III,250). However, he does not say what type of wood the tooth-stick should be made from. See **Tambūla**.

Nisātakā. A type of animal (Ja.VI,538).

Nīpa. *Nauclea cadamba*. A large straight tree with smooth brown bark, spreading branches, ovate leaves and small orange flowers (Bv.2,51; Ja.I,13).

Nīlagīva. See **Mayūra**.

Nīlapupphī. A type of plant with blue flowers (Ja.VI,536).

Nīlamakkhikā. The name means 'blue fly' and must refer to flies of the genera *Lucilia*, *Pycnosoma*, *Thelychoeta* and *Pyrellia*, of which there are many species in India (Ja.I,165; III,176). These flies, usually called 'blue bottles' in English, have distinctive iridescent abdomens and feed on animal and human faeces, carrion and moist garbage.

Nīlamaṇḍūka. Indian Pond Frog, *Euphlyctis hexadactylus*. This large frog has a flattish snout, smooth skin except on the flanks which are warty and is bright green or olive with a yellow streak extending from the nose to the vent. Pond frogs favour dense aquatic vegetation where they feed on insects, snails and sometimes smaller frogs. According to the Jātakas, the Bodhisatta was once reborn as a pond frog (Ja.II,238). The Pāli word *nīla* usually means blue but can also mean blue-green, green or dark-coloured.

Nīli. Indigo, Hindi *nil*, *Indigofera tinctoria* (A.III,230). A small shrub from which a blue dye is extracted. Indigo was a major crop in northern India until the development of synthetic dyes. We read of paint made of indigo (S.II,101). An extract of the leaves is also used as a medicine.

Nīvāra. Wild Rice or Red Rice, *Oryza rufipogon*, probably the same as what was called *karumbhaka*, *sayañjātasālī*, 'self-sown rice' or *rattasālī*, 'red rice' (D.I,166; Ja.III,247; V,37; Mil.252). Wild rice is an aggressive hardy

aquatic grass very similar to domesticated rice except that it has narrower leaves that are a deeper green and a red kernel. Wild rice is considered a pest because it infests paddy fields, then flowers and sheds its seeds before the harvest, thereby reducing the yield. A gruel consisting of wild rice, *sāmāka* and the leaves of some other herbs was given as a cure for bloody diarrhea (Ja.III,144). In the Jātaka, ascetics and animals are said to have eaten wild rice. See **Tañḍula**.

P

Pakkava. Bengali and Hindi *pakar*, *Ficus rumphii*. A large spreading tree with grey bark, broadly ovate leaves and a small round fruit that can be eaten. It is often planted in villages and along the sides of roads. The Buddha mentioned *pakkava* as a medicine (Vin.I,201).

Pakkhabilāla. Giant Indian Flying Squirrel, *Petaurista philippensis* (Ja.VI,538). The Pāli name means ‘flying cat’. The most common and widespread of several Indian flying squirrels, this small creature ranges in colour from coffee-brown to grey. It lives in thick jungle and can glide considerable distances from one tree to another.

Pakkhin. Bird, also *aṇḍajā*, *aṇḍasambhava*, both meaning ‘egg-born’, *dija* ‘twice born’, *pattayāna* ‘wing goer, *sakuṇa*, *vakkaṅga* ‘going this way and that’, and *vihāṅga* ‘sky travellers’ (D.I,71; Ja.I,216; V,8; VI,539; S.I,224; 197; Sn.221; 606; 1134; Th.599). Birds are feathered, egg-laying bipeds of the class *Aves*. Numerous kinds of birds are mentioned in the Tipiṭaka but not all of these can be identified. However, birds in general are frequently referred to. In the *Suśrutasaṃhitā* birds are classified as either peckers, scratchers, aquatic or birds of prey, although no attempt is made in the Tipiṭaka to classify them.

Birds leave no track as they fly through the sky (Dhp.92). They flock to big banyan trees to roost, eat the fruit and rest in the shade (A.III, 42). They have beautiful songs: ‘peacocks scream, herons cry and koels gently warble’ (D.III,201). The call of some birds sounded to the Indian ear like words, a point made by the grammarian Yāska. The *jīvaṃjīvaka*’s cry sounded like ‘Live!’ (*jīva*) and another bird seemed to say ‘lift up your hearts’ (*utthehi citte*, D.III,201). The monk Rāmaṇeyyaka said that the chirping and twittering of the birds in the forest did not disturb his meditation (Th.49). Whether in the forest or at the edge of the village, the bird songs always gave delight. The Jātaka says: ‘Around and about the trees can be heard the chorus of flocks of *najjuhā* birds and cuckoos as they fly from one tree to another. Amongst the branches and foliage they sing to passers-by and delight both newcomers and locals’ (Ja.VI,534). It was observed that birds like peacocks and pigeons sometimes eat pebbles or grit (Mil.67). Seafarers took birds with them on their voyages and would release them when they sailed out of sight of land. If the bird returned to the ship they would know they were still far from land (A.III,368; D.I,222).

The Buddha said that just as a bird flies off taking only its wings with it, monks or nuns should wander taking only a few simple possessions with them (D.I,71). A god once told a monk that just as a bird removes dust from itself after a dust bath with a vigorous shake, an ardent mindful monk should flick off the dust of the defilements (S.I,197). Birds like domestic fowl, quails and partridges were eaten and 'rice with well-dressed fowl' was a popular dish (Sn.241). Feathers were used to make fans and flights for arrows. Peacock feathers were used for decorative purposes, and the quills of some feathers were used as sewing needles (Vin.II,115) and to store things in. Some ascetics had cloaks made out of the feathers of certain birds. Domestic fowl and their eggs were an important part of people's diets. Wild birds like quails and pigeons were hunted for food and their eggs were collected. A fowler's gear might consist of a decoy bird, hair snares, a stick, probably for flushing the birds out of bushes, and a net (Ja.II,161). Hawks were trained to hunt (Ja.V,270). People put baskets in trees and under eaves for birds to nest in (Ja.I,242). Some of the birds mentioned as being protected in King Asoka's 5th Pillar Edict are the *cakkavāka*, *haṃsa*, *sāliya* and *suka*.

Pakkhipati. See **Sīṅgivera**.

Pakkhima. Spotted Dove, Hindi *parki*, *Streptopelia chinensis* (Ja.V,339; Th.139). This bird has pinkish-grey plumage with a distinctive and beautiful black neck with white spots on it. The spotted dove becomes quite tame if not molested and will come into yards and verandahs for food. It prefers well-wooded country but is also common in cultivated areas.

Paggavalli. A type of bitter-tasting creeper (Ja.II,105).

Paṅgura. See **Mandāra** (Ja.VI,535).

Pacālaka. A type of animal (Ja.VI,538). The name means 'shaker'.

Pañcavaṇṇahaṃsa. A type of water bird (Ja.V,356). The name means 'five-coloured goose' or 'five-coloured duck'. This could well refer to the Spot-billed Duck, *Anas poecilorhyncha*. The male of this bird has scaly patterned light and dark brown plumage, a white and metallic green speculum, a yellow-tipped bill and two red spots on the sides of its forehead. Pairs or small flocks of this duck are often seen in swamps and lakes where it feeds on vegetable matter by tipping 'bottom-up' in shallow water.

Paṭaṅga. A type of insect said to fly into burning lamps at night (Ja.VI,234; 506; Sn.602). The same thing is said of another insect called *salabha*. The modern Hindi equivalents of both *paṭaṅga* and *salabha* are used loosely and interchangeably for moths, grasshoppers and locusts.

Paṭāla. See **Alattaka**.

Paṭīkutta. A type of bird (Ja.VI,538). As the word *kutta* means 'woven' this might be referring to the Baya Weaver, *Ploceus philippinus*. This bird is similar in size and colouring to the house sparrow except that in the breeding season the male develops a bright yellow head and breast. Large flocks of baya weavers glean grain from harvested fields and sometimes damage growing crops also. Their nests are made out of tightly woven rough-edged grasses which are suspended from tree branches.

Paṭola. Painted Gourd, either *Trichosanthes cordata* or *T. dioica*. Both plants are called *patol* in Bengali, have a similar appearance and both have medical uses. The leaves of the painted gourd were used as a medicine (Vin.I,201).

Paṭṭa. A type of fine cloth (Bv.34,11; S.II,102; Vin.II,266). In the *Harṣacarita*, *paṭṭa* is described as a type of naturally yellow silk. See **Kosakāraka**.

Paṇaka. A type of moss or water plant (Ja.V,37). It is sometimes mentioned together with *sevāla* (Vin.III,177).

Paṇḍuhaṃsa. A type of water bird (JV,356). The name means 'yellow goose' or 'yellow duck'.

Paduma. Sacred Lotus, also known as *ambujā* 'water born', *bhisa*, *kamala*, *paduminī*, *pokkhara*, *saroruha*, *muḷālipuppha* or *vārija*, 'water born', *Nelumbo necifera* (D.I,75; Ja.I,146; Sn.2; Th.1089). The lotus is a perennial aquatic herb with large, round pastel-green leaves which sometimes float on the surface of the water or rise above it and with prickly stems (Sn.845). Lotus blossoms can be pink or white and were named *kokāsaka* or *kumuda* (Dhp.285; D.II,179) and *kokanada* or *puṇḍarika* (A.III,239; S.I,81) respectively, and also yellow. Five hues of white were also discerned (Ja.I,281). It seems that the word *paduma* was sometimes used loosely enough to include the Blue Water Lily, *Nymphaea caerulea*. This is clear from the fact that the Buddha mentions *paduma* as being white, pink or blue (A.I,145). As there is no blue lotus this must refer to the blue water lily, more commonly called *uppala* in Pāli.

Lotuses grew in the wild but were also planted in bathing tanks and garden ponds for beautification. When in Campa, the Buddha would stay at one such tank, Gaggara's Lotus Lake (D.I,111). Such ponds, whether natural or man-made are described as being full of cool, sweet and clear water and lotus blossoms of different colours (S.I,138; Vin.I,5). When still a bodhisatta, the Buddha had three palaces, each with a pond of blue water lilies and pink and white lotuses (A.I,145). The lotus has a sweet subtle perfume although it is hard to say whether this comes from the petals, the stem or the pistils (S.III,130). In one delightful story, a monk who waded into a lotus pool to bathe and smell the flowers was chided by a god for being a 'smell thief' (S.I,204). Comely young men or women were described as having 'an excellent lotus-like beauty' (A.III,90; 152) and a sincere and generous layman was described as 'the lotus of laity' (A.III,206). People would make garlands out of lotus blossoms and also eat the stems and roots (Ja.III,308) and a drink was made from the juice extracted from the root (Vin.I,246). Moggallāna is described as collecting lotus roots and stalks to make them into a medicine for fever (Vin.I,215). Lotus nectar was also drunk (Ja.V,466) and the leaves were used to make holders, to wrap food in (S.V,438) and even to carry water for short distances (Ja.III,107).

There are several things about the lotus that seem to have fascinated the Buddha and were often mentioned by him. The first was that such a beautiful pure flower emerges from dirty muddy water. To him, this was analogous to the enlightened person's transcendence of *samsāra*: 'Just as the lotus is born in the water and grows up beneath the water, yet remains undefiled by the water, fragrant and beautiful, even so, the Buddha is born in the world, grows up and dwells in the world but like the lotus unstained by the water, he is not defiled by the world' (A.III,347; S.III,140; Sn.71). The second thing was the fact that water will not adhere to the lotus leaf. Because of microscopic waxy papillae on the surface of the leaf water splashed on it turns into quicksilver-like drops and immediately slips off, leaving no trace of moisture. 'Whoever in the world overcomes this low unruly craving, sorrow falls away like drops of water on a lotus leaf' (Dhp.336; 401). See **Lomapaduma** and **Sogandhika**.

Padumaka. A type of tree (M.II,152).

Padumuttara. A type of tree (Ja.VI,537).

Padmaka. Himalayan Wild Cherry, Hindi *padam*, *Prunus cerasoides* (Ja.VI,535; 537). A medium-sized deciduous tree with ovate to lanceolate leaves and pink flowers. The fruit is succulent and tasty and the seeds are

used to make rosaries. The wild cherry tree grows mainly in the lower hills of Uttaranchal in India and the Mahabharat Lekh of southern Nepal.

Panasa. Jack Tree, Hindi *panas*, *Artocarpus integrifolia* (Ja.I,450; II160; V,205). A large tree with a dense rounded crown, shining green leaves and large round green fruit which is produced in huge amounts. The fruit, which emerges from the trunk and branches, can be eaten as can the seeds. Xuanzang wrote this of the tree: 'The jackfruit tree though plentiful, is highly esteemed. The fruit is as large as a pumpkin. When it is ripe it is of a yellowish-red colour. When divided it has in the middle many tens of little fruits of the size of a pigeon's egg. Breaking these there comes forth a juice of a yellowish-red colour and of delicious flavour. The fruit collects on the tree branches as prolific as the *fuling*'

Pabbaja. See **Naḷa**.

Pampakā. A type of water bird (Ja.VI,538).

Parābhuta. A type of bird (Ja.V,416).

Parivadantika. A type of bird (Ja.VI,539).

Paḷaṇḍuka. Onion, Hindi *piyaz*, *Allium cepa*. A small plant with long erect leaves and a round bulb, either white, brown or pink, depending on the variety. Monks and nuns were not allowed to eat garlic because the smell left on the breath could cause offence to others. They were however, allowed to eat onions (Vin.IV,259). In most early Indian literature, onion and garlic are considered despised foods.

Palaka. A type of plant (Ja.VI,564).

Palasata. A type of animal, according to the commentaries, another name for the rhinoceros, sometimes *palāsāta* or *phalasata* (Ja.VI,277; 454). The *palasata* is mentioned in Asoka's 5th Pillar Edict as being a protected animal. See **Khagga**.

Palāsa. See **Kiṃsuka**.

Pavāla. Red Coral, Hindi *parbal*, is the stony branched skeleton of the tiny marine invertebrate *Corallium rubrum* (Ja.II,88). Unlike many other types of coral this species is dense enough to be carved and polished. Red coral was one of the many precious things found in the ocean along with pearls, gems, beryl, conches, crystal, gold and silver, ruby and emerald (Ud.54). It

was imported into northern India, probably mainly from Kerala and the Red Sea and was used to make jewelry (Ja.IV,141).

Pavihi. See **Taṇḍula.**

Pasatamiga. See **Citraka.**

Pasādiyā. A type of grain (Ja.VI,530). The commentary says it is a type of rice (Ja.VI,531).

Pākahaṃsa. A type of water bird (Ja.V,357,VI,539). The name means ‘ripe goose’ or ‘ripe duck.’

Pāgusa. Pagusa Catfish or Yellowtail Catfish, sometimes also *pāvusa*, *Pangasius pangasius*, (Ja.IV,70; VI,278). A large silver-coloured fish found in the Ganges and its tributaries, the pagusa catfish feeds on shrimps and smaller fish. It is a popular food.

Pāṭali. Trumpet Flower, sometimes *pāṭhali*, Hindi, *paral*, Oriya *patuli*, *Stereospermum chelonoidis* (Ja.VI,537; Thi.263). A large tree with the leaves clustered at the end of the branches and which bears a beautiful trumpet-shaped yellow or sometimes pink flower. The village of Pāṭaligāma on the south bank of the Ganges, later to become Pāṭaliputta and now known as Patna, was named after this tree (D.II,85).

Pāthīna. *Wallago attu*. A large silvery-coloured barbled fish growing up to 1.5 metres long and commonly found in the Ganges and its tributaries (Ja.IV,70; VI,278). A fine steel sword is described as being the same colour as one of these fish (Ja.VI,449).

Pārāvata. Dove or Pigeon, sometimes *pārāpata* or *pārevata* (Ja.I,242; V,215; VI,456; 539), are birds of the Order *Columbiformes*. Nine species of doves and pigeons are found in northern India, although it is only possible to identify some of these from the information given in the Tipiṭaka. Amongst other things, they would eat grass seeds (Ja.I,242). Some cows are described as being ‘dove coloured’ probably meaning that they were gray (A.I,162). A certain gem is described as being ‘as beautiful as a dove’s eye’ (Vv.36,3). See **Kakuṭa**, **Kapota** and **Pakkhima**.

Pārīchattaka. A type of tree. See **Kovilāra**.

Pārījañña. A type of tree (Ja.VI,535), or perhaps another name for the *mandārava*.

Pārevata. *Diospyros embryopteris* (Ja.VI,529). A handsome tree with low spreading branches and a fragrant white flower which grows along the banks of streams and tanks. When new the leaves are a beautiful crimson. The pulpy fruit attracts monkeys but is not widely eaten by humans as it tends to burn the throat. The fruit rind is full of tannin and the bark has medical properties.

Pālibhaddaka. A type of tree, sometimes *phālibhaddaka* (Ja.IV,205). The name means ‘very auspicious’.

Pāvusa. Pabda Catfish, *Ompok pabda* (Ja.IV,70; VI,278). Growing up to 30 cm. long this fish is silvery-gray above and dirty white below and has two long barbells. It is commonly found in turbid rivers and streams and eats vegetable matter, small fish, frogs and insects. It was and continues to be a popular food fish. Because of its oily flesh the pabda catfish is also sometimes known in English as the Butter Catfish.

Pāsānamacchaka. A type of fish. The name means ‘stone fish’ (Ja.IV,70; VI,450). See **Maccha**.

Piṅgulāya. A type of bird, sometimes also *piṅguliya* (Ja.VI,538). The name may be a misreading of *pinguliya* meaning ‘red’ or ‘tawny’.

Picu. A type of animal (Ja.VI,537).

Piñjarodaka. The red-coloured fruit of a particular plant (Ja.VI,563).

Pipilikā. Ant, sometimes *kipillikā* (Ja.II,276; IV,331). Ants are a small insect of the order *Hymenoptera*, of which numerous species live in northern India. Ants were sometimes used to torture people (Ja.IV,375), and there are numerous references in the Tipiṭaka of anthills (Ja.III,86; Vin.III,151). See **Kunthakipillaka** and **Tambakipillika**.

Pippalī. Indian Long Pepper, sometimes *pippala*, Hindi *papal*, *Piper longum* (Vin.I,201). A slender aromatic climber producing a long spike covered with small seeds having a pungent pepper-like taste. A cave at Rājagaha where Mahā Kassapa used to stay was named after this climber (Ud.4). The seeds are used in cooking, to make chutneys and sometimes as a medicine. The use of long pepper has now been largely replaced by black pepper. See **Marica**.

Piyaka. A type of tree (Ja.VI,269).

Piyaṅgu. A flower from which a perfume was made (Ja.VI,336, Vv.53,7).

Piyaṅgu. Panic Seed, *Panicum italicum*. A type of millet which was made into a gruel (Ja.I,39). It was also used as a medicine (Ja.I,419). See **Kaṅgu**.

Piyāla. See **Rājāyatana**.

Pilakkha. Wave-leafed Fig, Hindi *pilkhan*, *Ficus infectoria* (Ja.III,24; S.IV,160, V,96; Vin.IV,35). A large deciduous tree with smooth ovate leaves with a wavy margin. Although not parasitic it often grows up against other trees and is a popular shade tree. The Buddha mentions the wave-leafed fig as an example of 'trees with tiny seeds and huge bodies that encircle the bodies of other trees so that they become bent, twisted and split' (S.V,96).

Piḷaṅka. A creature, probably an insect, that lives in dung (S.II,228).

Pucimanda. See **Nimba**.

Puṇḍarika. A type of tree. The former Buddha Sikhī was enlightened under one of these trees (D.II,4). *Puṇḍarika* is also a name for a white lotus. See **Paduma**.

Puttajīva. Hindi *putranjiva*, *Putranjiva roxburghii* (Ja.VI,530). A moderately-sized tree with drooping branches. The male flowers, which are small and numerous, are yellow and the female flower, larger and less numerous, are green. The seeds of this tree are commonly used to make prayer beads.

Puthuloma. A general name for fish of the order *Siluriformes*, called catfish in English (Ja.IV,466; Vv.44,11; 81.5). The Pāli name means something like 'wide hair' and refers to the whisker-like growths which catfish have around their mouths. An ancient lexicon on the Sanskrit equivalent of this name says 'having long hairs around its mouth'. Several hundred species of catfish are found in India including in the Ganges, the Yamuna and their tributaries. The nun Sumedha said: 'Do not give up true happiness for the sake of the inferior happiness of sense pleasures. Do not suffer afterwards like a catfish that swallows a hook' (Thi,508). See **Mahāmukhamaccha**.

Punnāga. *Calophyllum inophyllum*, (Bv.2,51; Ja.VI,530). A handsome moderately-sized tree with shiny leaves, large white fragrant flowers and a

globose pulpy fruit which becomes yellow when ripe. An oil extracted from the seed was used in lamps.

Puppha. Flower, also *kusuma*. Flowers are the reproductive structures of *Angiosperms*, flowering plants. Some of the components of flowers mentioned in the Tipitaka include the stem (*daṇḍa* or *vaṇṭa*), buds (*koraka*), petals (*patta* or *dala*), calyx (*gabbha*), filament (*kiṅjakka*) pericarp (*kaṇṇikā*) and the pollen (*renu*). Flowers were said to be of two types, those growing on land and those growing in the water, although sometimes two more types are added; those growing on creepers and those that emerge from tree trunks or branches (Ja.I,51; Vv.35.6).

The ancient Indians had a deep appreciation for flowers; they wore them in their hair, as garlands around their necks, used them to flavour their food and drinks and offered them to their gods. Flowers were associated with auspicious events. The *Nidānakathā* describes how all the plants in the universe burst into flower as the Buddha attained enlightenment: 'Flowering trees in the ten thousand world-systems sprung into bloom and fruit-bearing trees were weighed down with bunches of fruit. Flowers that blossom on tree trunk, branches and vines did so each in their respective places. Lotuses on stalks broke through the rocky crust and arose in bunches of seven and were heaped together layer upon layer' (Ja.I,76).

On Uposatha days, Buddhists would abstain from wearing perfume, makeup and garlands (A.IV,250). The Buddha said that flowers, incense and coloured paste should be offered to shrines (D.II,142) and people were employed to clear withered flowers from such shrines (Ja.V,449; Th.620). A part of the betrothal ceremony consisted of bedecking the bride with garlands (M.I,286) and the making of garlands was a recognized craft (Ja.V,292). *Kinnara*, mythical creatures with a bird's body and a human head were believed to dress in flowers, eat pollen and entertain themselves by swinging on creepers (Ja.IV,283). The Vinaya mentions a variety of garlands, wreaths and bouquets, although the differences between these are not clear (Vin.III,180).

Horticulture was in its infancy during the Buddha's time, but we do read of royal pleasure gardens surrounded by walls and staffed by guards and gardeners (Ja.I,251). Alcoholic drinks were made out of or flavoured with certain flowers (Vin.I,246; IV,109). The Buddha often used flowers as similes in his talks and sayings. For example: 'Just as many garlands can be made from a heap of flowers, so too many good deeds can be done by one born human' (Dhp.53), 'Like a flower that is beautiful but has no scent is the exhortation of one who speaks but does not act accordingly' (Dhp.51). Someone who spoke pleasantly was said to 'speak flowers' (Pp.3,4).

Pupphin. A plant with blue flowers (Ja.VI,536).

Purisālu. A type of animal, perhaps mythological (Ja.VI,537).

Puḷava. Maggot, Hindi *phulu*. Maggots are the second of the four stages flies go through in their lives, the others being egg (*āsaṭika*), pupa (*kosa*) and adult. Maggots usually feed on faeces and rotting matter but they can also infest living tissue, a condition called myiasis (Ja.III,176). The Buddha mentioned that lepers would sometimes get worms in their sores, probably a reference to maggots (M.I,506). See **Makkhikā**.

Pūga. Betel Palm, *Areca catechu* (Ja.V,37, V,323). An attractive tree with a single tall straight columnar trunk ending in a tuft of lush green leaves. It bears an ovoid bright-orange fruit with a single hard seed. This nut is cut into slivers, mixed with lime and the leaf of the betel vine and then chewed as a mild stimulant. Chewing betel nut is not mentioned in the four Nikāyas, the Vinaya, the *Mahābhārata*, the *Rāmāyana* or other early literature suggesting that it must have only been introduced into northern India from the south around the time of the composition of the commentary to the Jātaka. See **Tambūla**.

Pūtilatā. Gulancha Vine, Hindi *gilo* or *gilaya*, *Tinospora cordifolia* (Sn.29). According to the commentary, the plant was also known as *gaḷocī* from which its Hindi name is derived. This vine has a fleshy corky stem, blue-green heart-shaped leaves, yellow flowers and sends down slender aerial roots as it climbs through the forest. The gulancha vine has a strong and unpleasant smell and all parts of it are believed to have medicinal value.

Pelakā. A type of animal (Ja.VI,538).

Pokkharasātaka. A type of bird (D.III,202; Ja.VI,539).

Poṭakila. See **Tiṇa**.

Potthaka. A type of cloth described as rough and unpleasant to touch (A.I,246; Ja.IV,251) and which was made from jute fibre. The jute plant (*Corchorus capsularisa*) is a herb with pointed, serrated leaves and a yellow flower. It grows to a height of about 3 metres in the wild or often double that when cultivated. It is most well-known for the strong, shiny fibre produced from it. In Hindi *patt* is one of several names for the jute plant and the course cloth or canvas made from it.

Phañijjaka. Rosha Grass, Hindi *gandhejghas*, *Andropogon schoenanthus* (Ja.VI, 536; Vin.IV,35). A broad-leaved fragrant grass which grows mainly on rocky hills and dry forest areas. The plant gives an oil called in Hindi *palmarosa* or ginger-grass oil which is used in the manufacture of cosmetics.

Phandana. The Pāli name for this tree means ‘quivering’ and it was described by the Buddha as being the most pliable and workable of all trees (A.I,9). Its timber was considered suitable for making wheels because its branches would ‘bend but not break’(Ja.IV,209). Along with *sāla* and *dhava* it was the type of tree that people would clear parasitic creepers from, presumably because of its usefulness (A.I,202). This may be *Gardenia latifolia*, a small straight tree with thorns on the trunk and branches, elliptic leaves and which is common in dry forests. The wood is close-grained, very flexible and does not split and in the past was used to make drums, hoops, wheels and circular containers.

Phandanamāluvā. A type of creeper (Ja.VI,528; 534).

Phalaka. Spinach, Hindi *palak*, *Spinacia oleracea* (Ja.V,478). Spinach is an annual herb cultivated for its nutritious green wrinkled ovate leaves.

Phāṇita. See **Ucchu**.

Phārusaka. *Grewia Asiatica*, (Vv.33,31). A medium-sized tree producing globose fruit, red to purple in colour and with a tart taste. The fruit was made into a drink (Vin.I,246) and taken as a medicine for stomach complaints.

Phussaka. A type of bird (A.I,188). The name means something like mottled or speckled. The Buddha contrasted the diminutive call of this bird with that of the *ambakamaddari* and the domestic fowl.

B

Baka. Cattle Egret, Bengali *go bak*, *Bubulcus ibis*. This bird has pure white plumage, a dagger-like orange-coloured bill and a neck shorter than most other egrets and herons. During the breeding season, the male's head, neck and shoulders turn orange. The cattle egret is a gregarious bird and often seen in paddy fields together with grazing cattle. The egret sometimes catches a fish, wedges it in the fork of a tree and then pecks it to death (Ja.I,222). They also eat frogs (Ja.III,430).

Bakula. See **Vakula**.

Badara. The fruit of the Jujube Tree, also called *badarapandu*, *bhadarapandu* or *kola*, Hindi *baer*, *Zizyphus jujuba* (A.I,130). A moderately-sized tree of shrubby form and with a spreading crown. It is sometimes cultivated for the edible fruit. The fruit is described as being egg-shaped, reddish and beautiful (Ja.III,21) and on one occasion, Ānanda compared the Buddha's complexion to the beautiful translucent yellow of the jujube fruit in autumn (A.I,181). It was sometimes mixed with food (Vin.IV,76) and on one occasion the Buddha was offered a meal which included pork with jujube (A.III,49). During the time the Buddha practised austerities before his enlightenment, he sometimes ate only one jujube fruit a day (M.I,80). The small two-celled stone of the fruit was called *kolaṭṭhi* (Thi.498).

Badālatā. A type of creeper that was said to have appeared during the early evolution of the Earth and which was 'sweet like pure wild honey' (D.III,87).

Bandhuka. *Ixora coccinea* (Ja.VI,279). A dense shrub with oblong shiny leaves and a bright scarlet flower. Both the root and the flower of this plant are used as medicines.

Bandhujīvaka. *Pentapetes phoenicea* (A.V,62; D.II,111; M.II,14). A small attractive shrub easily recognized by its long, sharply-toothed leaves and its large red flowers.

Babbaja. See **Naḷa**.

Babbu. See **Biḷāla**.

Barihin. See **Mayūra**.

Barihisa. A type of grass used in sacrificial rituals (A.II,207; M.I,344).

Bala. See **Kāka**.

Balākā. A type of water bird described as having a crest and yellowish wings (Ja. III,226; Th.307) which could be a description of the Great Crested Grebe, *Podiceps cristatus*. This beautiful bird has a long slender white neck, a pointed bill, grey back and chestnut wings. Both sexes have pointed crests, the male's being more noticeable than the female's. The male also has distinctive chestnut and black ruffs which become more pronounced during the breeding season. Crested grebes are usually found in pairs or small groups in wetlands where they feed on fish, insects and crustaceans.

Baḷiyakkha. A type of bird (Ja.VI,539).

Bahucitra. A type of bird (Ja.IV,406).

Bidala. A type of pulse which was made into soup (Ja.IV,352).

Bimba. Hindi *bhimb*, *Cephalandra indica*, sometimes *vimba* (Ja.VI,457). A herb climbing by means of tendrils and with five-angled stems. The cylindrical fruit is narrowed at each end and green with white stripes gradually becoming scarlet as it ripens. It is widely eaten.

Bimbijāla. A type of tree (Ja.V,155), perhaps the same as *bimbijāla*. The former Buddha Dhammadassi was enlightened under one of these trees (Ja.I,39).

Biḷārā Sasakaṇṇikā. This is not a name as such but a description meaning 'the hare-eared cat' (Ja.V,406), which probably refers to the Caracal, *Felis caracal schmitzi*. This medium-sized cat is reddish-grey above fading to buff or white below and has a short tail. The large ears are triangular and pointed, black on the back and with long erect tufts of black hair on the tips. The caracal prefers dry scrubland where it shelters in hollow trees and under boulders during the day and hunts birds and small mammals at night. The caracal is critically endangered in India.

Biḷāla. Domestic Cat, also called *babbu*, *babbuka*, or *majjāra*, Hindi *billi*, *Felis sylvestris* (D.II,83; J.I,480; Vin.I,186). Cats are small mammals of the family *Felidae* with rounded heads, erect ears and large eyes with vertical-

slit pupils. They also have sharp claws that can be retracted into sheaths. The ancient Indians did not keep cats as pets but only to kill rats and mice and other household pests. The Buddha commented that a cat will sit at a door post, a rubbish heap or a drain patiently waiting for mice (M.I,334). Nāgasena said: 'As a cat in caves and holes and inside large houses, seeks only after rats, so too the meditator, the earnest student of meditation, in the village, the forest, at the root of a tree or an empty place should constantly, continually and with diligence seek only the nourishment of mindfulness of the body' (Mil.393).

There are several species of wild cats in northern India; the Leopard Cat (*Felis bengalensis*), the Fishing Cat (*Felis viverrina*) and the Jungle Cat (*Felis chaus*) being the main ones. The mention of jungle cats (*araññabiḷāla*, Ja.VI,334; VI,277) and of the hunting of cats probably refers to these animals rather than their domestic cousin. The cat skin bags the Buddha spoke of were probably made out of the beautifully marked pelts of wild cats such as the leopard cat (M.I,128).

Biḷālī. Lesser Indian Reed-mace or Lesser Cat's Tail, *Typha angustata* (Ja.IV,371; VI,578). A large marsh plant growing up to 2 metres high. The dense cluster of the female flowers form a rust-coloured cylindrical spike sometimes as much as 40 cm. long and resembling a cat's tail. A yellow cake is made from the flowers and is a popular food with village people (Ja.IV,46).

Bija. Seed. A seed is a new plant in the form of an embryo. Some of the parts of seeds mentioned in the Tipiṭaka include the husk (*thusa*), the kernel (*miñja*), and in the case of germinating seeds, the sprout or shoot (*aṅkura*). The seeds of certain plants are encased in a pod (*sipātaka* or *kuṭṭhilika*). In order to germinate a seed has to have an intact casing, be fresh, be unspoiled by wind or heat and be sown in a good field with properly prepared soil (A.I,135). Some seeds have hard shells that crack only if burned and it was noticed that new shoots often appear quickly after a forest fire (S.I,69). The two factors that enable a seed to grow are nutrition from the soil (*paṭhavi rasa*) and moisture (S.I,134). Whether the leaves or fruit of the plant is sweet or bitter was believed to depend not on the nutrition but on the nature of the seed (A.I,32). Commenting on the endless cycle of agriculture the monk Kāḷudāyin said: 'Again and again they sow the seed; again and again the god king rains; again and again farmers plough the fields; again and yet again the country has grain' (Th.532). Some of the seeds mentioned in the Tipiṭaka include **sāli**, **vīhi**, **mugga**, **māsa**, **tila** and **tanḍula** (M.I,57). Elsewhere, the first two of these are included in a list of edible grains (Vin.IV,264). See **Dhañña**.

Bijakanila. A type of water plant (Vin.III,276).

Bīraṇa. *Andropogon muricatus* (S.III,137). A common stout tufted grass usually found growing in damp or swampy ground. When dried the root of this grass, called *usīra* in Pāli, gives off a pleasant fragrance. The Buddha mentioned the fine fibres of the *usīra* root (A.I,204) and recommended the root itself as a medicine (Vin.I,201). It was also used to rub down elephants (Ja.V,39) and corpses were sometimes laid out on a bed of *bīraṇa* grass (D.III,7). The *Mahāvastu* describes a maiden as having a complexion like *usīra*, probably referring to the fresh root's delicate pink colour (Mv.II,59). The Buddha said: 'This I say to you, sirs, who are gathered here; dig up the root of craving as one seeking the *usīra* digs up *bīraṇa* grass' (Dhp.337).

Beluva. Bengal Quince or Wood Apple, sometimes also *vilva*, Hindi *bel*, *Aegle marmelos* (Ja.III,77; IV,363). A small tree with thorns near the base of the leaves and a greenish-white flower. The fruit is called *billa* (Ja.III,77;VI,578) and is round, yellow when ripe and contains a sweet aromatic pulp. The monk Kokālika developed boils all over his body as big as a Bengal Quince which burst open causing him to die (S.I,150). Pañcasikha's lute was made out of yellow wood of this tree (D.II,265) and ascetics made their staffs out of the wood also (Ja.VI,525). The pulp of the fruit has medicinal properties and is used to treat dysentery.

Bhaginimālā. A type of flowering tree (J.V.420; VI,269).

Bhaṅga. Cannabis, *Cannabis sativa* (Vin.I,58). Cannabis is a tall annual herb with broad spear-shaped leaves with serrated edges and which emits a particular odor. Steam from cannabis leaves boiled in water was used as a sweating treatment for sore limbs and rheumatism (Vin.I,205). Fibre from the stem was used to make ropes and woven into a coarse cloth (D.II,350 Vin.III,256). There is no mention in the Tipiṭaka of cannabis being taken for its hallucinogenic effect. The Hindi word *bhāṅg* is now used specifically for the dried leaves of this plant.

Bhañjanaka. A type of red-coloured vegetable. It was an offence for monks and nuns to eat it, probably because it left a strong smell on the breath (Vin.IV,259).

Bhaṅḍi. A type of plant (Ja.V,420;VI,537). This might be *Geranium nepalense*, a small herb with short woody stem and rose-coloured flowers with a purple eye. The plant is used as an astringent. Alternatively, it might be *Albizza lebbek*, a large fast-growing tree commonly planted along

roads. The tree is most noticeable when it loses its leaves and its numerous long pods can be heard rattling in the wind.

Bhaṇḍu. A type of bird, possibly the swift (Ja.VI,538). The House Swift, *Apus affinis* is a small smoky-black bird with a white throat, long narrow wings and a square tail. It is often seen roosting and nesting near human habitation. During the day it flies about at great speed catching insects and in the late afternoon it congregates in large numbers high in the sky uttering a shrill tittering cry.

Bhanditittiranāmaka. A type of bird (Ja.VI,538). The name is obscure but may mean something like 'bald-headed grouse'.

Bhaddamuttaka. Nut Grass, Hindi *mothā*, *Cyperus rotundus* (Ja.VI,537; Vin.IV,35). A common weed with a pleasant-smelling tuber which was used as a medicine (Vin.I,201).

Bhamara. Rock Bee, *Apis dorsata*. A large aggressive wild bee with a shiny black body and which builds huge nests on cliffs and the branches of tall trees. It is one of several native Indian bees which produce honey collected for human consumption (Ja.VI,536). The Buddha said that a monk depending on a village for alms should be like a rock bee which collects honey from the flower without damaging its colour or fragrance (Dhp.49). He also said that a lay person should accumulate wealth the way a rock bee gathers pollen, i.e. diligently (D.III,188). Glossy black hair was often compared to the colour of the rock bee (Thi.252) as was an arahat's clay bowl (Ja.IV,114). One of the strings of the Indian lute was called the *bhamaratanti* because it sounded similar to the deep resonant humming of this bee (Ja.II,253). The *Nidānakathā* mentions a swarm of 'five-coloured *bhamaras*' (Ja.I,52). The *Carakasamhitā* mentions *bhamara* as one of the eight types of honey. See **Khudda** and **Madhukara**.

Bhallātaka. Marking Nut Tree, Bengali *bhelatuki*, *Semecarpus anacardium* (Ap.346; Ja.VI,578). A medium-sized tree with low spreading crown and large leathery leaves which cluster near the end of the branches. The dark brown bark has an acrid juice and a black resin extracted from the fruit is used by washer men to mark laundry.

Bhaveyya. A type of tree with an edible fruit (Ja.VI,529).

Bhassara. A wading bird, probably either the Black Ibis, *Pseudibis papillosa*, or the Glossy Ibis, *Plegadis falcinellus* (Ja.VI,538). In Hindi the first bird is called *baza* or *kala baza* while the second is called *chhota baza*.

The black ibis has black plumage with a white patch on its wings and red warty skin on its crown. The smaller glossy ibis has dark brown plumage with glossy black wings. Both birds are found around water, although the black ibis will also feed in dry paddy fields, grassland and lawns.

Bhāsa. Eurasian Sparrow Hawk, sometimes *bhassara*, Hindi *basha*, *Accipiter nisus* (Ja.VI,538), a medium-sized hawk with a brown head, back and wings, a white throat and spotted breast and with four or five black bands on its tail (Sn.790). The Eurasian sparrow hawk preys mainly on other birds, including those much larger than itself. Until recently it was trained and used for hunting.

Bhīnkāra. Possibly the Greater Racket-tailed Drongo, Hindi *bhimraj*, *Dicrurus paradiseus* (Ja.V,416). A glossy-black bird with a tufted forehead and a long tail ending in two wire-like prongs with spatula ends. The drongo is a noisy bird with a variety of calls, is very good at mimicking other birds and is often kept as a pet.

Bhujalaṭṭi. A type of flowering tree, probably also *bhuja* (Vv.35,5). The name means ‘snake creeper’. A woman is described as having a waist as slender as a *bhuja* twig (Ja.VI,457). This tree was believed to grow in heaven although it may have also had an earthly counterpart.

Bhūmipapaṭaka. A type of mushroom or fungus that appeared at the beginning of the world (D.III,87).

Bheradaka. See **Sigāla**.

Bhobhukka. See **Soṇa**.

M

Mam̐si. See **Narada.**

Makara. This name usually refers to a mythical marine creature with a huge head and mouth and a small body (Ja.II,442). However, there is mention of pins being made out of *makara's* teeth and a pattern used to decorate buildings and cloth was called '*makara's* tooth' (Vin.II,113, 117,152) suggesting that there was actually a fish of this name. If so, it may refer to *Pristis perotteti*, a species of saw fish. This large fish has a long, broad and flat snout with up to 20 sharp teeth down both edges. Although a marine fish, its strange and fearsome-looking snouts may have been imported into northern India. In the past, the fins of this fish were dried and exported from India to China, an oil was extracted from the liver and the tough skin was used to make sword scabbards and sandpaper.

Makasa. Mosquito, also *sūcimukha* 'needle mouth', Hindi *machar* (A.II,117; S.I,52; Sn.20). Small delicate flying insects belonging to the order *Diptera* that feed on blood. Numerous species of mosquitoes are found in northern India including nine species of *Anopheles* mosquito known to carry malaria. Mosquitoes were one of the many things forest-living monks and nuns had to learn to live with. The monk Gahvaratīriya urged a patient endurance to such biting insects: 'Annoyed by flies and mosquitoes in the forest, in the great jungle, be like an elephant in the thick of the battle and endure mindfully' (Th.31). The affliction called 'snake-wind-disease' (*ahivātakaroga*) is thought by some modern scholars to have been malaria (Vin.I,78; Ja.IV,200).

The Saṃyutta Nikāya mentions a man 'whose testicles were like pots' (S.II,258), a common symptom of filariasis. There is also a reference to people suffering from elephantiasis (*sīpada*, Vin.I,91). Both diseases are caused by *Wuchereria bancrofti*, *Brugia malayi* and several other species of roundworm transmitted by mosquitoes. The mosquitoes proboscis was sometimes referred to as a tooth (Ja.III,477).

People protected themselves from mosquitoes by sleeping under nets (Vin.II,119) and protected their flocks from them by lighting smouldering fires (Ja.III,401). Even wild animals kept away from swamps to avoid mosquitoes. In the Jātaka there is a story of a man who asked his son to swat a mosquito that had landed on his head. The stupid boy hit the insect with an axe and killed his father (Ja.I,247).

Makkaṭa. Rhesus Macaque, sometimes also *kapi*, Bengali *markat*, Hindi *bandar*, Marathi *makda*, *Macaca mulatta*. This large, aggressive and mischievous primate has a brown coat, a short tail and a bare red and white patch on its rump. When in estrous the female's face goes red. Macaques live in close proximity to humans and are often seen in cities, especially around temples, where they eat flower and food offerings. Commenting on the rapidly changing nature of consciousness the Buddha said: 'Just as a macaque moving through the trees grabs one branch and lets it go only to seize another, so too that which is called thought, mind or consciousness arises and disappears continually both day and night' (S.II,95). The monk Valliya compared the body to a five-doored house and the mind to a macaque racing around inside it. Then he cried to himself: 'Be still, macaque, stop running. Things are not as they were before. Now you are restrained with wisdom' (Th.125-6). Baby macaques were sometimes kept as pets and adults were trained by street entertainers. We read of such an entertainer having a macaque and a snake play together (Ja.II,267). Ascetics would sometimes have cloaks made out of macaque skins (Ja.V,235-6). Interestingly, while the Jātaka say the Bodhisatta was occasionally reborn as other types of monkeys, he was never as a macaque. See **Kapi**.

Makkaṭaka. Spider, also called *aṭṭhapadā* 'eight legs', and *uṇṇānābhi* 'wool-belly', Hindi *makdi* (Ja.II,147; V,47; 469). Spiders are insectivorous arthropods of the order *Araneae*. There are dozens of species of spiders in northern India but not enough information is given in the Tipiṭaka to identify any particular type. In one place we read of dew drops hanging on spiders' webs making it look like a net of pearls (Ja.IV,120). The Buddha said: 'Those infatuated by passion are carried along by a self-created stream, like a spider following its own web' (Dhp.347).

Makkhikā. House Fly, Hindi *makhi*, *Musca domestica* (A.II,117; M.I,10; III,148). A small two-winged insect, grey with dark stripes and often found around human habitation where it feeds off and breed in carrion, faeces and moist garbage. The larva of the house fly, the maggot, was called *pulava* (S.V,131; Sn.672) and was described by the Buddha as a creature that is 'born, lives and dies in darkness' (M.III,168). Maggots are sometimes mentioned together with *kimi* and *gaṇḍuppāda*.

Maṅkuna. Bed Bug, Hindi *makhun* (Ja.I,10). A small rusty-red nocturnal insect which feeds on human blood, the two most common species in northern India being *Cimex lectularius* and *C. rotundatus*. Bed bugs are often found in bedding and clothes and their bites cause welts on the body and intense itching. People would shake their mattresses in the mornings

to get the bed bugs out (Ja.III,423). The presence of bed bugs indicates overcrowding and poor hygiene.

Maccha. Fish, also called *ambuja* 'water born' or *vārija* (S.I,52). Fish are aquatic cold-blooded vertebrates usually covered with scales. Numerous types of fish are found in the rivers and ponds of northern India, many of them edible. However, only a few of those mentioned in the Tipiṭaka can be identified. Fishing was an occupation, although fishermen were despised together with butchers, fowlers, hunters, robbers, murderers, jailers and others 'who follow a blood-soaked work' (A.III, 383). There is frequent mention in the Jātaka of fish being eaten, even by ascetics and Brahmins (Ja.I,390; III,52). Apparently it was often consumed together with alcohol (Ja.I,349; III,435). Fish were caught in nets, traps, hooked lines or were sometimes speared (Ja.I,427), and fish was eaten fresh or dried (Ja.I,349). When fishermen caught fish they would throw them onto the sand and later spit them and roast them in hot embers (Ja.II,178). We read of fish in a garden pond coming to be fed at the sound of a drum (Ja.II,227). Fish sense when a drought is coming and try to swim out of their ponds (Ja.II,80).

According to the commentary of the Vimānavatthu, one of the gates of Vārānasi was called the Fisherman's Gate, probably because it opened on the river where fishermen worked or sold their catch (Vv-a.19). The Buddha compared the way thoughts flit through the mind to the thrashing of a fish when pulled out of the water (Dhp.34). Once he scolded some noisy monks, saying that they sounded like fishermen pulling in a good catch (A.III,30). Fish were sometimes used in idioms of the time; a devious person was said to be as unknowable as 'the course of fish in the water' (Ja.I,295; 300), and to 'be tongueless like a fish' meant to be taciturn (Ja.VI,295). Sailors who drowned at sea were said to have become 'food for the fishes' (Ja.V,75).

One Jātaka story mentions a gold-coloured fish (Ja.IV,335) which must be a reference to the Golden Barb, *Puntius ahsii*. This fish is golden-coloured with silver highlights and has a distinct black spot on the base of its tail. Growing up to 8 cm. long the golden barb is found in the standing waters of rivers and in lakes and ponds with silty bottoms where it feeds on small crustaceans and insects. Indian peasants consider the golden barb to be an auspicious creature and it is also a popular aquarium fish. Another type of fish mentioned without being named is one with a human-like body, a razor-like nose and which leaps in and out of the sea (Ja.IV,139). The *Ĵātakamāla* mentions the same fish and adds that it looks like it is covered with silver armor (Jm.XIV,10-2).

Other kinds of fish mentioned but which cannot be identified are the *aggaraka*, *āli*, *kāla-mahā-maccha*, *kāla-maccha*, *muñja*, *muñjarohita*, *pāsāṇa-macchaka satavaṃsa*, *savaṃka*, *silutta* and the *vājala* (Ja.I,222;

IV,70; V,405; VI,278). According to the Jātaka, the Bodhisatta was once reborn as a fish (Ja.I,331). See also **Amarā**, **Mahāmukhamaccha**, **Pāgusa**, **Pāvusa**, **Puthuloma**, **Rohita**, **Sakula**, **Silābhu**, **Singu** and **Susukā**.

Majjara. See **Biḷāra**.

Majjhāru. Probably *Plumbago rosea*. A medium-sized shrub with spreading branches and a long tube-shaped red flower. The leaves or perhaps the bark of the *majjhāru* were used for making coverings (Vin.I,196).

Mañjetthī. Madder, Hindi *manjit*, *Rubia cordifolia* (Ja.VI,279). A spreading herb that climbs over shrubs and bushes by means of tiny hooked hairs on its stems. It has a yellowish-white flower and a crimson dye is extracted from the bark of the root. This crimson is one of the five basic colours along with blue, red, yellow and white (Vin.I,25). Artists included in their palette paint made from lac, turmeric, indigo and madder (S.III,152). Madder dye used to be known as 'Indian Red' and was widely used in the cloth industry until the development of synthetic dyes.

Mañjīthikā. Red Rot, *Colletotrichum falcatum*. A fungal pathogen that attacks sugar cane (A.IV,279; Vin.II,256). The organism causes longitudinal reddish streaks in the internal white tissue of the plant resulting in stunted growth. Red Rot is most common during the rainy season.

Mañjūsaka. Uncertain but perhaps the *Carallia integerrima* (Vv.38,6; 44,6). A small tree with grey bark, shiny leathery oblong leaves, small green flowers and aerial roots.

Maṇḍu. *Randia dumetorum*. A small common tree with smooth bark fissured with fine lines and white flowers which gradually turn yellow. It is covered with long straight thorns. In one Jātaka story a man renders a mango seed infertile by pricking it with a *maṇḍu* thorn (Ja.II,105).

Maṇḍūka. Frog, also sometimes *bheka*, Hindi *manduk* or *bhek* (Ja.III,430, IV,247). Frogs are amphibians of the order Salientia of which about 190 species live in India. Frogs have long hind legs adapted for jumping, large heads with protruding eyes and usually live in or near water. The most common and easily seen frog in northern India is the Skittering Frog, *Euphlyctis cyanophlyctis*. This medium-sized smooth-skinned frog is grey, brown or blackish, often with darker spots and a black belly. It is usually seen on the side of ponds and puddles or floating contentedly on the surface. When alarmed, it skitters over the surface, sometimes for a

considerable distance, then dives and buries itself in the mud. The skittering frog is seen in all seasons and eats insects and small vertebrates.

We have a description of crows eating frogs in a dried-up pond (Ja.V,106). In his poem in praise of the Ajakaraṇī River, the monk Sappaka mentioned the deep-throated croaking of the frogs (Th.310). When told that people could wash away their sins by bathing in sacred rivers, the nun Puṇṇikā quipped that if this were so then all the turtles, crocodiles and frogs would go to heaven (Thi.241). Once, a group of people sat listening to the Buddha preach and a frog, attracted by the sound of his voice, joined the audience. The frog was accidentally crushed by a cowherd's stick and was afterwards reborn in a heaven realm (Vv.51,2). Unripe fruit was said to be 'as green as a frog' (Ja.VI,529) and snakes were sometimes called 'frog eaters' (Ja.III,16). See **Nīlamaṇḍūka** and **Uddhumāyikā**.

Maddālakā. A type of bird (Ja.VI,538).

Madhuka. Honey Tree, Hindi *mahua*, *Bassia latifolia* (Ja.IV,434; VI,93; 529). A large tree with a dense rounded crown, large oblong elliptic leaves attractive cream-coloured flower. The Honey Tree is particularly useful although it is very slow growing and only rarely cultivated. The wood is good and strong, the fleshy corollas of the flower are sun dried and eaten and a sweet spirit can be made from them. It was probably this drink that the Buddha forbade monks and nuns to take (Vin.I,246). The unripe fruit is eaten cooked and oil extracted from the seeds is used for cooking and lighting.

Madhukara. Bee, literally 'honey maker', sometimes *madhumakkhika*, 'honey fly' (Ja.IV,265; VI,506). Bees are winged insects belonging to the order *Hymenoptera*. There are three main species of bee native to northern India, the Rock Bee or *bhamara* and the Little Bee, which are both wild, and the Indian Hive Bee, *Apis indica*, which is domesticated.

Honey was a much sought-after food. It was eaten with rice (Th.23), used as a medicine (Vin.III,77) and sometimes made into mead (Vin.IV,110). Lumps of crystallized honey are mentioned (Vin.I,221) as are honey cakes (A.III,237), honey balls (M.I,114) and wild honey (D.III,87). To find the bees' hives, honey gatherers would tap the trunks of likely trees (Ja.III,200). Bees' wax was used for various purposes and when mixed with oil was applied to the hair (Vin.II,107; 116). Diabetes was known as 'honey urine' (Vin.IV,8). The Buddha's first meal after his enlightenment was honey balls and barley gruel offered to him by the merchants Tapassu and Bhalluka (Vin.I,4). The Buddha described as 'honey-tongued' the person whose speech is 'harmless, pleasing to the ear, agreeable, going to the heart, urbane, pleasant and liked by everybody' (A.I,128). See **Khudda**.

Madhuyanti. A type of flowering tree or shrub (Ja.VI,536).

Madhulaṭṭhi. A sweet juice extracted from either the fruit or the flower of a particular creeper (Ja.VI,537).

Madhulaṭṭhikā. Licorice, Hindi *mulhatti* or *jethi madh*, *Glycyrrhiza glabra* (Ja.I,68; VI,537). The Pāli name means 'honey stick'. This hardy shrub bearing lavender-coloured flowers does not grow in northern India and its sweet-tasting root was probably imported from Kashmir or Persia. The root is harvested and then dried and cut into pieces or powdered. An extract from the root is taken for abdominal pain, vomiting, chesty cough and sore throat.

Manosilāhaṃsa. Uncertain but perhaps the Pink-headed Duck, *Rhodonessa caryophyllacea* (Ja.V,356). About the size of the domestic duck this bird has dark-brown plumage, a bright pink bill and head and a pink speculum which is very noticeable in flight. The last pink-headed duck in the wild was seen in 1935 and the last known specimen died in captivity in England in the same decade. It is now presumed to be extinct.

Mandārava. Indian Coral Tree, also *paṅgura*, Hindi *mandara* or *pangram*, *Erythrina sublobata* (Ja.I,13; 39; IV,359), a medium-sized ornamental tree commonly cultivated in gardens in India. This tree has conical prickles on its trunk and branches, broad trifoliate leaves and beautiful bright red flowers. The flowers appear before the new leaves have grown. It was believed that coral trees grew in heaven (Ja.I,202; V,281; 392) and it was the blossoms from these divine trees that fell from the sky just before the Buddha's final Nirvana at Kusinārā (D.II,137). There is also mention of a five-hued coral tree (Bv.1,36).

Mandālaka. A type of aquatic plant (Ap.347; Ja.VI,564).

Mayūra. Peafowl, also called *barihin*, *mora*, *sikhāṇḍī* and *nilagīva*, 'the blue-necked one', Hindi *birahni* or *morwa*; *Pavo cristatus*. A large ground bird with a distinctive crest and long tail. The male has a beautiful blue-green neck, breast and tail and chestnut brown wings. Peafowls congregate in small flocks, roost in trees at night and have loud 'may-aw' calls which can be heard over a long distance. The early morning cry of the 'beautiful blue-necked and crested peacock' would wake sleeping monks (Th.22). They are 'fair-crested, fair-winged, with beautiful blue necks, fair-faced and have a beautiful song and a fine cry' (Th.211). The colour of the peacock's neck was compared with that of beryl (Ja.I,207).

Fly whisks were made out of peacocks feathers (Vv.33,44) and Indian magicians have always used peacock feather fans as their wands. The Buddha compared lay people with the peacock and monks with the goose. The first is beautifully adorned but a clumsy flier, while the second is drab-coloured but can fly with ease (Sn.221). In the Bamboo Grove at Rājagaha, there was a place where people came to feed the peafowl. The peafowl often appears in the Jātaka stories and the Bodhisatta was reborn as a peacock on several occasions and once as a peahen (Ja.II,33; III,126; IV,333).

Mayhaka. A bird described as eating the figs and uttering the cry ‘*mayha mayha*’ (Ja.III,301). To the ancient Indians this cry sounded like ‘Mine! Mine!’ and in popular imagination the bird was believed to be greedy. It is difficult to identify this bird but it might be the Yellow-Legged Green Pigeon, *Treron phoenicoptera*. This stout yellow, light-green and gray bird has a lilac patch on its shoulders and yellow stripes on its black wings. A gregarious bird, it is often found in large numbers in banyan and Bodhi trees eating the figs. The famous ornithologist Saleem Ali describes its call as a ‘pleasant, musical, mellow whistle up and down the scale, with a particular human quality’.

Marica. Black Pepper, Hindi *mirc*, *Piper nigrum* (Vin.I,201). A branching climbing shrub producing long spike on which there are numerous small green round seeds which become black when dried. Pepper, either ground or whole, is used to flavour food and as a medicine (Vin.201). In its ground form it causes sneezing (Ja.I,456). Pepper only grows in south India and must have been imported into the north. See **Pippala**.

Maruvā. Perhaps *Sansevieria roxburghiana*, Bengali *murba* (M.I,429), a erect fleshy plant with tufted leaves. The plant yields a very strong fibre that was still being used to make bow strings at the beginning of the 20th century.

Mallikā. See **Sumanā**.

Mahāmukhamaccha. A type of fish (Ja.II,424). The name means ‘big-mouthed fish’ and probably refers to the Boal Fish, *Wallago attu*, a species of large catfish commonly found throughout India including in the Ganges and its tributaries. This fish can grow up to 1.5 metre long and is known for its huge gaping mouth and voracious appetite. Wading birds, domestic ducks and even dogs have been found in the stomach of this fish.

Mahāveḷu. Great Bamboo, described as being ‘thick, beautiful, not pithy, leafy, straight, big, good to look upon and delightful’ (Bv.13,26-9). The largest bamboo native to northern India is *Bambusa tulda* which can grow to a height of 21 metres and with a diameter of over 60 centimetres. This bamboo is widely cultivated. The previous Buddha Sujāta is said to have been enlightened under this type of bamboo. See **Veḷu**.

Mahāsoṇa. Hindi *sona*, *Calosanthos indica*. A small tree with few branches, long board leaves and a large fleshy purple coloured flower. The previous Buddha Paduma is said to have been enlightened under one of these trees (Bv.9,22).

Mahisa. Asiatic Buffalo, also *mahīsa* or *mahiṃsa*, Hindi *mahisha*, *Babalus bubalis* (A.III,121; M.I,42; S.II,188). A large slate-grey bovine with sparse hair on its hide and large spreading horns (Ja.VI,507). The domestic variety is used to pull plows and carts and for its rich milk. The wild buffalo, *Babalus arnee*, sometimes called *vanamahisa*, ‘forest buffalo’, is larger and much more aggressive than the domestic variety and is now extinct in northern India (Ja.III,26; III,76). Buffalo fights were a popular form of entertainment (D.I,6). According to the Jātakas, the Bodhisatta was once reborn as a wild buffalo (Ja.II,385).

Mātuluṅga. Wild Orange, sometimes *mella*, Hindi *khatta*, *Citrus aurantium*. A small thorny many-branched tree, the fruit of which is globose or oblate, with a thin green rind and a juicy flesh similar in taste to the sweet lime. The Jātakas say that the flesh of the wild orange is sweet but the skin is sour (Ja.III,319).

Māluvā. Camel’s Foot Creeper, Hindi *malu*, *Bauhinia vahlii* (Dhp.162; S.I,207). This evergreen creeper, the largest in the Indian forest, has soft porous wood, velvety rusty-coloured shoots, paired tendrils and a creamy-white flower. The leaves, which are sewn together to make plates, are downy beneath and have two rounded lobes on the end giving them the shape of a camel’s footprint and hence the plant’s English name. The big woody pods burst open in the summer heat. The seeds can be eaten and the strong rough fibre in the bark is used to make ropes. Despite its usefulness, the camel’s foot creeper causes great damage to forest trees, twining around them, stunting their growth and sometimes killing them (Ja.V,452). It is a fast-growing plant (Dhp.334) and its leaves are large enough to be used as plates (Ja.V,389) or even mats or covers to sit on (Ja.V,205). A man described his lover as ‘clinging to me like a *māluvā* creeper’ (Ja.V,215).

The Buddha said that passions spread the way the *māluvā* creeper spreads through the forest (Sn.272). On another occasion he used this

plant in a parable in which he warned that although sense pleasures may give immediate satisfaction, they can cause problems later:

‘Imagine that in the last month of the summer the pod of a *māluvā* creeper bursts and a seed drop at the foot of a sal tree... Being fertile and not being swallowed by a peacock, eaten by an animal, destroyed by a forest fire, carried away by a forester or destroyed by termites, it was eventually watered by the rains, sprouts and put forth a soft downy shoot which wound around the sal tree. The spirit living in the sal tree thought “The touch of this *māluvā* creeper is pleasant.” But in time the creeper grew around the tree, made a canopy over it and draped a curtain all around it and broke its branches. And then the spirit of the sal tree thought “This is the coming danger. Because of this creeper I am now experiencing painful, racking, piercing feelings”’. (M.I,306).

Māsa. Black Gram, *Vigna mungo* (Ja.V,37; Vin.III,64) is similar to the green gram and probably shares a common ancestry with it. Someone who could not make clear distinctions was said to be ‘unable to tell *mugga* from *māsa*’ (Ja.VI,355).

Māhanīpa. *Barringtonia racemosa* (Bv.12,24). A medium-sized tree with its leaves mainly clustered at the end of the branches, a hard fruit with a single seed and beautiful pale-pink flowers.

Miga. A word used loosely for game animals, particularly deer, and especially for the Blackbuck, *Antelope cervicapra*. The male blackbuck has a black or dark brown back, with white patches around the eyes, a white chin and underside and long spiralling horns. The female, called *eni* or *hariṇa*, is similar, only smaller and with a fawn-coloured back and no horns (Ja.II,26). Blackbuck are found in open grassland and light scrub and are now extinct in northern India. A beautiful woman was described as being ‘doe-eyed’ (Ja.V,215) and the Buddha said that those monks who followed his instructions lived happily, unruffled and ‘with a mind like a *miga*’ (M.I,450). Forest-living monks were often said to be like *miga* in that they were alert, harmless, wandered freely and retreated deeper into the forest when they encountered people (Ja.I,390; Mil.212; Sn.39). Grazing blackbuck continually keep their ears erect and twitching in order to detect the slightest sound (Ja.VI,559).

The Buddha proclaimed the Dhamma for the first time in a blackbuck reserve called Migadāya near Vārāṇasi and the pedestals of ancient Indian Buddha images depicting this event often include two

blackbuck flanking a Dhamma wheel. A proverb said that a dishonest person is 'as twisted as the horn of an *issā*' (Ja.V,425). This would seem to be referring to the blackbuck's distinctive spiralling horns and thus *issā* may be another name for the animal (Ja.V,416). During the Islamic period and perhaps earlier, blackbuck were sometimes tamed and kept as pets and for their meat and milk. In the *Milindapañha*, the blackbuck is included in a list of domestic animals (Mil.267). See **Ajina** and **Eneyya**.

Migamātukā. A type of animal, a small red-coloured deer according to the commentary (Ja.I,388).

Milhakā. Sometimes also *milhakā* or *piḷhakā*. A type of creature that feeds on faeces, probably an insect. The Buddha described this creature as being 'a dung-eater, stuffed with dung, chock-full of dung' (S.II,228).

Mugga. Green Gram, Hindi *mung*, *Vigna radiate* (D.II,293; Ja.I,429; M.I,57; S.I,150; II,139). A commonly cultivated plant which produces small green edible seeds. Before his enlightenment, when he was practising austerities, the Buddha ate soup made from green gram (M.I,245). It was said of someone who could not make clear distinctions that they 'could not tell *mugga* from *māsa*' (Ja.VI,355). A gruel of sesame, rice and green gram was given as a medicine (Vin.I,201).

Muggatiya. Probably *Phaseolus radiatus*, Hindi *mung* (Ja.VI,536). A small plant of which there are four varieties all of them widely cultivated for their small edible beans. In some varieties the bean is khaki green, in others black or yellow.

Mucalinda. Uncertain but perhaps *Pterospermum acerifolium*, sometimes *mucala*, Hindi *muchukundi* (Ja.V,405, VI,269; 536). A large shapely evergreen tree with large white flowers. The Buddha spent his third week at Uruvelā sitting at the foot of a *mucalinda* tree. While there a great rainstorm began and the dragon Mucalinda sheltered him saying: 'Let not cold or heat, the touch of flies or mosquitoes, wind or heat or creeping things disturb the Lord' (Ud.10).

Muñja.¹ A type of fish (Ja.IV,70; VI,278).

Muñja.² Hindi *munj*, *Saccharum munja*. A large spiky tufted grass that commonly grows along the banks of rivers and tanks. It was used to make various articles including fetters for cows (D.I,77; M.II,17; Sn.28; Th.27). The Buddha said that *samsāra* was as tangled and twisted as a rope made of *muñja* grass (A.II,211). Warriors wore belts made from *muñja* grass to

indicate that they were prepared to fight to the death (Ja.V,202). When Māra tried to talk Prince Siddhattha out of continuing his quest for enlightenment, the prince replied: 'Look, I wear *muñja* grass', meaning that he could not be deterred from his quest (Sn.440). Today, *muñja* grass is used to make mats, ropes and paper.

Muñjarohita. See **Maccha**.

Muttā. Pearl. These small round shiny silvery-white objects are sometimes found in the marine bivalve the Black-lip Oyster, *Pinctada margaritifera* (Ja.III,437; IV,120;VI,489). This mollusk is found all down the east coast of India. Pearls were used as jewelry, usually as strings (Ja.VI,345), earrings or nets, and were one of the many precious things coming from the ocean along with gems, beryl, conchs, quartz, coral, gold and silver, rubies and emerald (Ud.54). A beautiful woman's teeth were described as being like pearls (Ja.V,203). One of the jobs of the royal assessor was to value the pearls the king wished to buy (J.IV,137). A story about the theft of a queen's pearl necklace by a monkey is one of the more popular Jātaka stories (Ja.I,383). According to the *Gaṇeśa Purāna*, pearls were harvested in the waters off Sri Lanka, Kathiawad and Tamrilipti and and must have been imported from these regions into northern India. See **Saṅkhamutta**.

Muddayanti. *Carum copticum*, a slender plant with small leaves (Ja.VI,536). The seeds are aromatic and are eaten for their pleasantly pungent taste.

Muddikā. Grape Vine, of which there are two species native to India, the Indian Grape, *Vitis indica* and the Fox Grape, *Vitis labrusca* (Ja.VI,529). Both are deciduous woody vines climbing by means of tendrils. The fruit, called grapes, grows in bunches and vary in colour from green to blue-black and can be either tart or sweet. The fruit of the Indian grape is used to make a mediocre wine while that of the second is thick-skinned and is only rarely used for this purpose. Grapes were eaten fresh or preserved by drying and the juice was extracted from them and made into a refreshing drink (Vin.I,246). Vinegar was probably made from sour wine (Ja.II,342; V,465). The Buddha said the essence that the vine absorbs from the earth contributes to the grape's sweetness (A.I,32). The grape vine and its fruit are depicted on the railing of the stūpas at Bharhut and Sanchi.

Mūlakakanda. Horse Radish, Hindi *muli*, *Raphanus sativus* (Ja.IV,88). An annual or biannual herb with bushy toothed leaves, a prominent root and a white or purple flower. The Indian radish is less developed than the European variety, its root being small, conical and white. Both the root

and leaves are eaten either cooked or raw and an oil is extracted from the seeds.

Mūsikā. House Mouse, also called *ākhu*, Hindi *musa*; *Mus musculus*. A small rodent varying in colour from brown to grey and with small ears and a tail usually longer than its body. Commonly found in homes, the mouse also lives in fields and scrub. The Buddha said that there are four types of mice; those that dig holes but do not live in them, those that live in holes that they have not dug, those that neither dig holes nor live in them and those that live in the holes they have dug (A.II,107; Ja.137). Mice would sometimes frolic happily in barns (S.I,170). Superstitious people believed that it was possible to foretell the future by examining holes chewed in cloth by mice (D.I,8).

There are numerous species of field mice, dormice and bandicoots found in northern India and the word *mūsikā* may well have been used for some of these also. According to the Jātaka, the Bodhisatta was once reborn as a mouse (Ja.I,460).

Mella. See **Mātulūṅga**.

Moca. A type of banana (Ja.V,405; 465). The fangs of the hounds of purgatory were said to be as big as the fruit of this tree (Ja.IV,181). A drink was made from the fruit (Vin.I,246).

Mora. See **Mayūra**.

Moragu. *Achyranthes aspera*. The leaves of this erect grass have soft hair on their underside and the seeds have spikes so that they adhere to animal fur and clothing. *Moragu* grass was used to make coverings (Vin.I,196).

Y

Yava. Barley, Hindi *jau*, *Hordeum vulgare* (S.V,10; Vin.III,15; IV,264). An annual erect tufted grass resembling wheat and producing an edible grain. Cattle had to be prevented from wandering into barley fields and eating the crop (S.IV,195). After harvesting, it was tied into sheaves and beaten with flails (S.IV,201). Barley was used as food, fodder and in brewing. A popular preparation was called *yāvaka* (Ja.VI,373) which Pāṇini says was made by pounding barley in a mortar to remove the chaff, boiling it in either water or milk and then adding sugar. Barley meal, called *sattu*, was prepared as a gruel or made into a dough and baked (Ja.III,343; Vin.IV,80). The Buddha's first meal after his enlightenment was barley gruel and honey balls offered to him by the merchants Tapassu and Bhalluka (Vin.I,3). Monks put barley meal in their needle cases to prevent the needles from rubbing together and becoming blunt (Vin.II,116). In ancient India the width of a barley corn was used as a unit of measurement.

The Buddha mentioned that the awn (*sūka*) of a barley corn if positioned wrongly, could pierce the hand or foot and draw blood (A.I,8). A proverb said that a person could get irritated the way a barley awn irritates the eye (Ja.VI,294). The Buddha mentioned another type of barley without naming it: 'When a barley field is ready, the contamination, the chaff, the rubbish of barley may appear, its root, stalk and leaf the same as true barley but without the same head. Only when the head forms do the farmers know "This is the contamination, the chaff, the rubbish of the true barley" and knowing this they pull it out by the roots and throw it outside the barley field. And why? Because they think "Let it not contaminate the true barley"'. (A.IV,169). This probably refers to Wild Barley, *Hordeum spontaneum*, the ancestor of *H. vulgare*, which looks very similar to it except that they has a shorter stem, narrower leaves and a smaller head. Wild barley competes with cultivated barley, lowers yields and is considered a weed.

Yūthikā. Sometimes *yodhikā*, *Jasminum auriculatum* (Ja.IV,440; VI,537). An erect bush with simple ovate leaves and a beautifully perfumed white flower. It is often cultivated in gardens but also grows wild. See **Sumanā**.

Yodhikā. See **Yāthikā**.

R

Rattasālī. See **Nīvāra.**

Ravihaṃsa. A type of water bird (Ja.VI,539). The name means ‘sun goose’ or ‘sun duck’.

Rājahaṃsa. King goose or duck (Ja.I,207). It is not clear whether this refers to an individual bird recognized by the others as their ruler or a particular species of bird. In Hindi the name *raj hans* is used for the Greater Flamingo, *Phoenicopterus ruber*, the Greylag Goose and the Bar-headed Goose. The greater flamingo is a long-legged, long-necked bird with white plumage and a large down-turned bill. The legs, parts of the wings, bill and naked area around the eyes are bright pink. The flamingo is occasionally seen in northern India feeding around lagoons, salt pans and estuaries. For the other two birds see **Haṃsa** and **Kādamba**.

Rājāyatana. Chirauli Nut Tree, sometimes also *piyāla*, Hindi *pival*, *Buchanania latifolia* (Ja.IV,363). A medium-sized straight tree with rough bark and dense pyramid-shaped clusters of white flowers. The globose black fruit is very palatable and was eaten (Ja.V324) and today is widely used in confectionery. A light-yellow oil with a sweet aroma similar to almond oil is extracted from seeds. During his stay at Uruvelā, the Buddha spent seven days sitting at the foot of a *rājāyatana* tree. While there, the merchants Tapassu and Bhalluka became his first disciples (Vin.I,3).

Rājikā. The dark-brown oblong seed of the Mustard plant, Hindi *raji*, *Brassica juncea*. The plant itself is a slender, long-leaved herb with a bright yellow flower. It grows wild but is also sometimes cultivated for the pungent oil extracted from the seeds. These seeds were used as a unit of weight for measuring gold (Ja.VI,510; Th.97). See **Sāsapa** and **Siddhatthaka**.

Rukkha. Tree, also *duma*, *jaḡatāruha*, ‘earth grown’, *pādapa*, ‘foot drinker’ and *viṭapin* (A.III,43; Bv.9,28; Ja.I,216; VI,178). Trees are perennial erect plants usually with a single woody stem from which branches bearing leaves extend. The Jātaka say: ‘It is called a tree because it has branches. Without branches it’s just a stake’ (Ja.IV,483). The Tipiṭaka mentions many types of trees and trees in general. Some of the structural components and other parts of trees referred to include the roots (*mūla*),

trunk (*daṇḍa* or *khandha*), the periderm or outer bark (*papaṭikā*), the phloem or inner bark (*taca*), sapwood (*pheggū*), heartwood (*sāra*), branches (*sākhā*), twigs (*pasākhā*), leaves (*paṇṇa* or *patta*) and crown (*agga*, M.I,193-6).

Roots, those parts of trees and other plants that anchor them and absorb and transport water and nutrients, are discussed in detail in the Tipiṭaka. Some of the different root systems mentioned include woody roots which could be either long or short (*dīghamūla*, *rassamūla*, Ja.II,346), tap roots and lateral roots (*mūlāni ahogamāniyāni tiriyaṅgamāni*), feeder roots (*nāli*), spreading roots (*mūlasantānaka*), hair roots (*mattāni*, S.II,87-8; III,155), and in the case of some other plants, tubers (*āluka* or *āluva*, Ja.IV,46) and bulbous roots (*kanda*, D.I,101). The aerial roots of banyan trees were called 'trunk-sprung' (*khandhaja*, Sn.272). It was understood that roots absorb moisture and nutrition from the soil and that the sap (*ojā*) moves upwards through the trunk into the branches and leaves. The *Visuddhimagga* says:

'When a great tree is growing on the earth, nourished by the essence of humus and, with that as condition, its roots and trunk, branches and shoots, foliage, flowers and fruit grow so it fills the sky and continues the tree's species until the end of the aeon, one cannot say that the essence of humus is only found in the roots but not in the trunk or in the fruit but not in the roots, and so on. And why? Because it spreads throughout the whole tree from the roots upwards' (Vism.688).

The Buddha said: 'Just as a tree that has been cut down can grow again if its root is undamaged and complete, in the same way this suffering returns again and again if the tendency to craving is not removed' (Dhp.338). However, it was observed that some plants, palm trees in particular, could not grow again if they were 'cut off at the root' (A.I,137).

There were still large forested tracts in northern India during the Buddha's time. The Mahāvana or Great Forest, extended almost unbroken from the outskirts of Vesālī to the lower Himalayas. Once, the Buddha stayed in a forest near the village of Pārileyya where an elephant looked after him (Ud.42). Other forests visited by the Buddha were the Dark Wood near Sāvattthi (S.I,130), the Forest of Offering at Kusinārā (A.V,78), the Gosiṅga Forest at Vesālī where many sal trees grew (A.V,134) and the Cool Forest to the west of Rājagaha near the city's charnel ground (A.III,374). Very large and majestic trees were sometimes called *vanaspati*, 'forest lords' (Ja.IV,229; S.IV,302; Vin.III,47).

The Buddha encouraged monks and nuns to seek solitary lodgings in the forest (A.II,250), 'at the roots of trees, mountain slopes, a glen, a hill cave, a cemetery or a scrubland' (M.III,3). He said: 'The one who wears rag-robcs, who is lean, with protruding veins and who meditates alone in the forest; him I call a true Brahmin' (Dhp.395). Some monks tried living in hollow trees and in the fork of trees (Vin.I,152). A forest-dwelling monk was advised not to settle down at the foot of a tree on a border, one used as a shrine, one from which resin or fruit was collected, one in which flying foxes roost, a hollow tree or one growing in a monastery (Vism.74).

However, forests could also be frightening places; they were the abode of dangerous animals and bandits, and travellers could get lost in them (A.I,153; Ja.I,320; S.II,98). The Buddha commented that when he lived in the forest before his enlightenment sometimes at night 'an animal would prowl around, a peacock would snap a twig or the wind would rustle the leaves' and he would be filled with terror (M.I,21-2). Those entering the forest had to be careful of what fruit they ate as some was poisonous (Ja.III,200). Some woodlands were thorny, unpleasant and difficult to walk through without getting cut or scratched (S.IV,189).

Trees, whether wild or cultivated, provided people with many useful products; the main ones being fuel for fire and material for building. People gathered fire wood in forests (S.I,180) and a Jātaka say: 'Forests are made of (potential) fire wood' (Ja.I,289). Once the Buddha met King Pasenadi's minister of works while he was supervising the cutting of timber in a sal forest (S.I,179). The Bhaddasāla Jātaka makes the interesting comment that all the royal palaces in India were supported by numerous columns, some of which must have been wooden. It seems that the king of Benares wanted to construct a magnificent palace supported by a single column and commanded his officers to find a tree trunk big enough for the purpose. They went to the forest and located enough such trees but the state of the roads, they reported to the king, would not allow for the transportation of such a huge log (Ja.IV,153).

Fences and kraals were made out of the branches of thorn trees (Vin.II,154). The leaves of certain trees were used to make various household articles such as baskets, fans and plates and were used as wrappers for food (Ja.VI,510; S.V,438). Parasols could also be made out of leaves (Ja.III,79). The seed pods (*sipātikā*) of some trees contained down (*tūla*) which could be used to stuff pillows and pad furniture and saddles. We read of wooden tubs (Ja.I,250) and of a canoe being made out of a single large log (S.I,106). Forest-living ascetics built themselves leaf huts (*pañnakuti*, D.III,94; S.I,226; Ja.II,72; 273) to live in. Bas-reliefs from Sanchi, Mathura and Gandhara give some idea of what such huts looked like. They were round with pointed tops and covered with leaves which appear to be

fixed to a stick or bamboo framework. The leaves of the teak, the *Bauhinia vahlii* and several other forest plants would be big enough to be used for this purpose.

Another product of trees that a use was found for was the bark (*taca*, *vāka* or *vakkala*, A.I,152; D.I,167; Ja.II,13; M.I,198). Household articles like fans and ropes are occasionally mentioned as being made out of bark (Ja.III,204; Vin.II,130). Ascetics are often described as being dressed in *vakkala* (A.I,240; Ja.II,272). Although this is usually taken to mean a type of cloth made from bark this may not be the case; more likely it was made out of fibres from the phloem or inner bark of some type of tree or trees. *Vakkala* clothing made a rustling noise as the wearer moved (Ja.II,274). The commentary to the *Nidānakathā* mentions some of the benefits of this unusual type of clothing: It is cheap, it can be made by oneself, it is hard to get dirty and easy to wash, it is easy to mend, it is not difficult to get a new one when the old one is worn out, it is suitable for the ascetic life, thieves do not bother to steal it, it does not beautify the wearer, it is light to wear, it is conducive to contentment, it can be obtained by righteous means and if it is lost it causes no regret (Ja.I,9).

Vakkala might have also referred to ordinary cotton or hemp cloth coloured with a dye made from the bark of the *tiriṭi* tree (D.I,66; M.I,343). There are occasional references to ascetics wearing bast or wood fibres (*dāru*), which might be an alternative name for *vakkala* (Ud.6), or wearing *phalaka*, which may have been wooden slats or even wood shavings (Vin.I,305). These and similar unusual clothing are described as the 'characteristic of ascetics of other sects' and were not allowed to be worn by Buddhist monks (Vin.I,305). It is difficult to identify the trees, the bark or bark fibres of which was used to make cloth. However, some modern Hindu ascetics wear cloth made from the bark of *Careya arborea*, the trees and bushes of the *Hibiscus* genus, particularly *H. tiliaceus* and *H. collinus*, and also from banana trees.

The Buddha encouraged the planting of fruit trees along roads to offer both shade and food for travellers (S.I,33). We read of a man tapping tree trunks with his axe to find hollow ones to use as water pipes (A.IV,171) and another doing so to find hollows where bees might be nesting (Ja.III,200). Sometimes as an act of merit, people would repair roads by filling in pot holes, removing large stones and cutting down the trees that might strike the axles of passing chariots and carts (Ja.I,199). Certain trees were cultivated for their fruit, flowers, foliage and timber. To grow successfully, a sapling had to have its roots cleared of weeds from time to time, be fertilized with humus (*paṃsu*) and be regularly watered (S.II,89).

People believed that spirits (*ārāmadevatā*, *rukkhadevatā*, *vanadevatā*, A.III,369; M.I,306; S.IV,302) lived in medical herbs and trees,

particularly very old, gnarled or beautiful ones. They lived in the hollow of trees or in their crowns (Ja.I,405; 423). Before cutting a tree, a woodsman would inform the tree spirit of his intentions and make offerings to it (Ja.I,442; IV,153). Other trees were worshipped and given offerings because the spirits were believed to grant wishes. Milk and water were poured on the roots, garlands were hung in the branches, lamps of scented oil were burned around them and cloth was tied around their trunks (Ja.II,104). There is the occasional mention of animal and even human sacrifices being made to trees. The victim's blood was poured around the foot of the tree and the entrails were draped over the branches (Ja.I,260; III,160).

It was believed that trees would give their bounty on condition that they were treated with a degree of respect and the Buddha told a story that illustrates this point. Long ago, the mythical King Koravya had an amazing banyan tree in his realm which bore fruit of exceptional sweetness. Everyone in the realm enjoyed the fruit freely and so there was no reason to guard the tree. But one day a man ate his fill of the fruit then broke a branch and went away. This act of ingratitude so incensed the tree spirit that it caused the tree to bear no more fruit (A.III,369-70). As with other popular beliefs and superstitions the Buddha did not endorse tree worship. He said: 'Gripped by fear people go to sacred mountains, groves, parks and trees. But these are not a safe refuge, not the best refuge. By going there one is not freed from all suffering' (Dhp.188-9). However, the Buddha did respect the beliefs of others and when a certain monk cut down a tree worshipped by local people to make way for a monastery he severely rebuked the monk for doing so (Vin.III,156).

Some of the most beautiful passages in Buddhist literature relate to trees. The Buddha said of a kindly hospitable person that he was 'like a great banyan tree growing on the side of roads that welcomes weary travellers with its cool shade and soothes their tiredness' (Ja.VI,526). The general Buddhist attitude of respect for trees is expressed in these words from the *Petavatthu*: 'Of the tree in whose shade one sits or lies, not a branch of it should he break, for if he did he would be a betrayer of a friend, an evil doer... Of the tree in whose shade one sits or lies, not a leaf should he injure, for if he did he would be a betrayer of a friend, an evil doer' (Pv.21,3; 5). The *Milindapañha* says that the diligent disciple should try to be like a tree: 'As a tree makes no distinction in the shade it gives, like this, the meditator should make no distinction between any beings, but develop love equally to thieves, murderers, enemies and to himself' (Mil.410). The *Buddhacarita* compares spiritual practice to a tree 'the fibres of which are patience, the flowers virtue, the boughs awareness and wisdom, which is rooted in resolution and which bears the fruit of Dhamma' (Bc.13,65). The *Mahāvastu* says: 'The meritorious person grows like a banyan tree, while the person of meagre merit becomes stunted like

a tree planted in the roadway' (Mv.II,423). In his *Bodhicaryāvatāra*, the poet Śāntideva wrote of his longing for the peace of the forest life in these words: 'The trees do not speak harsh words nor do they try to please by artifice. When shall I have the opportunity to dwell with those happy to live with the trees?' (Bcv.VIII,26).

Rukkhakoṭṭasakuṇa. See **Koṭṭha**.

Ruca. A type of tree described as having a straight trunk and spreading branches (Ja.I,441). We read of a *ruca* tree growing in a king's pleasure garden where it was worshipped (Ja.I.443).

Ruru. A type of deer (Ja.IV,256; V,406; 416). It is sometimes also called *rohitaruru*. As *rohita* means 'red' it might be another name for the Swamp Deer. See **Rohicca**.

Ruhamghasa. Blood-eater, probably a term for leopards and or tigers (Ja.III,481). See **Dipi** and **Vyaggha**.

Romā. A type of bird (Ja.VI,538).

Roruva. A type of animal, the sinews of which were used in making arrows, probably for binding the arrow heads and flights (M.I,429).

Rohicca. Swamp Deer, also known as Barasingha, *Cervus duvauceli* (Ja.VI,537). This name means 'the red one'. This large animal has a light reddish-brown coat in the summer, turning darker in the winter, and a creamy-white on the rump, chin and throat. Stags have the biggest spread of antlers of any deer in tropical Asia and can have up to twelve prongs. Swamp deer favour thick forest bordering pools and swamps. Huge herds of swamp deer used to inhabit the flood plains of the Ganges and Brahmaputra Rivers but in this region the animal is now restricted entirely to the Dudhwa National Park bordering on Nepal. See **Ruru**.

Rohita. Red Sun Fish, *Labeo rohita* (Ja.II,433). An edible carp found in the Ganges and its tributaries, the sun fish is orange-brown on the back becoming silvery on the sides and abdomen. Sometimes there is also a red mark on each scale. The sun fish can grow up to 91 centimetres long and is commonly netted in rivers and propagated in artificial ponds. It was believed to be good luck to see or touch one first thing in the morning (Ja.IV,72-3). One of the most well-known Jātaka stories concerns two otters quarrelling over the ownership of a red sun fish (Ja.III,333).

Rohitaruru. See **Ruru.**

L

Laṃghi. A type of deer that moves in a series of jumps (Ja.VI,537).

Laṅghīpitāmaha. A term for cranes and herons meaning ‘whose grandfather was a deer, or a jumper’ (Ja.II,363; III,226).

Laṭukikā. See **Lāpasakuṇa.**

Latā. A general word for creepers, climbers and vines. The Buddha compared craving to the fast growing and entangling creeper: ‘The streams (of desire) are always flowing and the creeper (of craving) sprouts and grows. Seeing this creeper, cut it off at the root with wisdom’ (Dhp.340).

Labuja. Bread-fruit Tree, Hindi *lakooch*, *Artocarpus altilis* (D.I,53; Ja.IV,363; Vv.35,5). A medium-sized deciduous tree with large leathery leaves covered with a soft rusty-coloured down. The tree produces a round yellow fruit which can be eaten either cooked or pickled (Vin.III,60). *Artocarpus altilis*

Lasuṇa. Garlic, also *ativisā*, Hindi *lasun*, *Allium sativum* (Vin.IV,258). An onion-like herb emitting a strong odor, the bulbs of which can be eaten. Because of the strong smell garlic leaves on the breath which others could find offensive, the Buddha forbade monks eating it, although he allowed it to be taken for medicinal purposes (Vin.II,140). Garlic was sometimes also known as *Māgadhaka*, ‘of Magadha’, apparently because it was commonly grown in that country (Vin.IV,259). Indians have long considered garlic to be detrimental to both physical and spiritual well-being. The *Manusmṛti* says that a Brahmin will lose his caste if he eats garlic. After travelling through India in the 7th century, the Chinese pilgrim Xuanzang wrote: ‘Onions and garlic are little grown and few people eat them; if anyone uses them as food they are expelled beyond the walls of the town.’

Lākhā. A resinous secretion produced by the Lac Insect, Hindi *lakh*, *Laccifer indicola* (Ja.VI,55). The tiny red larva of this insect settle on the young shoots of certain plants and secrete lac to protect their bodies. This is collected, processed and then made into various objects or used as a paint or dye. Lac is red in colour (Thi.440) and was used to make coins, tokens (Vin.III,237) and paint (S.II,101; III,152). Women painted the palms

of their hands and the soles of their feet with lac dye (Ja.VI,269). See **Alattaka**.

Lāja. See **Dhañña**.

Lāpasakuṇa. Quail, sometimes also *laṭukikā* (Ja.III,174; M.I,449). The Pāli name means 'chattering bird' probably because of the squeaks, whistles and nattering sounds quails exchange when in flocks. Six species of quails are found in northern India, all of them very similar and the most common being the Common Quail, *Coturnix coturnix*. About the same size as a dove, this squat, plump little bird has light brown plumage covered with pale yellow-brown spear-shaped streaks and mottles, a white band around the front of its neck and above its eyes. Like other quails, it is often seen in pairs or large flocks in grasslands and cultivated fields. Quails could be seen running amongst the clods after the fields had been ploughed (Ja.II,59; S.V,146). They were hunted with nets (Ja.I,208) and taken home to be fattened up before being eaten (Ja.I,434). Male quails are very pugnacious and setting them to fight each other was a popular entertainment (D.I,6).

Once, when the arrogant young Brahmin Ambaṭṭha was visiting the Sakyans, he got the distinct impression that they were whispering about and laughing at him. Later he complained of this to the Buddha who defended his kinsmen by saying: 'But Ambaṭṭha, even the quail, that little bird, can talk as she likes in her own nest' (D.I,91). According to the Jātaka, the Bodhisatta was once reborn as an elephant and became leader of a large herd. A quail made her nest in the elephant's feeding ground and the Bodhisatta stood over it to prevent it being trampled by the other elephants (Ja.III,174). Again according to the Jātaka, the Bodhisatta was once reborn as a quail (Ja.II,59).

Lāpu. A type of vegetable, perhaps the same as **lābu** (Ja.I,312; 336; 341). The *Milindapañha* says: 'As the *lāpu* fastens onto grass, branches or a creeper with its tendrils and grows up over them, a son of the Buddha, striving for arahatship, supporting himself (with meditation) can grow in an adept's fruit' (Mil.374).

Lābu. Bottle Gourd, Hindi *lauki*, Bengali *ladu*, *Lagenaria vulgaris*. A small climber with hairy leaves and which bears large white flowers. It is widely cultivated for its dumbbell-shaped fruit which contains a sweet edible pulp. The shell of the fruit is very hard and is used as containers and for the body of musical instruments (Ja.I,158; V,37). There is mention of honey being kept in such a container (Ja.VI,528).

Lāmajjaka. Hindi *lamjak*, *Cymbopogon jwarancusa*. A tall densely-tufted grass with a very aromatic root. This root is used to soothe fever and also to flavour food. The Buddha was once offered a meal of rice gruel cooked with jujube and sesame oil and mixed with pepper, garlic and *lāmajjaka* (Vv.43,6).

Lulopa. A type of tree (Ja.VI,537).

Lepa. See **Jatu**.

Lodda. Hindi *lodh*, *Symplocos racemosa* (Ja.V,405). A small evergreen tree with dark grey, oblong elliptic leaves and white flowers gradually turning yellow.

Lompaduma. A type of plant (J.VI,497). See **Paduma**.

Lolupa. A type of plant (Ja.VI,537).

Lohapiṭṭhā. A type of bird (Ja.VI,538). This name means ‘copper back’ which would be a good description of the Crimson Sunbird, *Aethopyga siparaja*. The male of this sparrow-sized bird has a glistening crimson back and a metallic green head and tail, while the slightly smaller female is a dusky olive green. It is found throughout India in moist-deciduous and evergreen forests flitting from flower to flower as it drinks nectar. It also eats insects.

Lohitasālī. See **Nīvāra**.

V

Vaṃsa. See **Veḷu**.

Vaṃsacoraka. A type of plant from which perfume was made (Ja.V,406).

Vakkala. See **Rukkha**.

Vakula. Bulletwood Tree, also *bakula*, Bengali *bakula*, *Mimusops elengi* (Ja.V,420; VI,535). A medium-sized tree with leaves varying in shape from oblong to lanceolate and with star-shaped creamy white flowers and berries that turns yellow when ripe. Oil pressed from the seed is used in lamps and an extract from the flower is used in perfumes.

Vagguli. Bat, winged mammals of the order *Chiroptera*. There are over 100 species of bats in India but it is not possible to identify any particular species from the information given in the Tipitaka. Bats sometimes lived in the darker corners of rooms and their droppings caused an unpleasant smell requiring monks to put screens on their windows to keep them out (Vin.II,148). One of the austerities practised by some ascetics was called 'the bat practice' which involved hanging upside down (Ja.I,493; III,235; IV,299). The ancient Indians considered bats to be a type of bird.

Vaca. Sweet Flag, Hindi *bach* or *vacha*, *Acorus clamus* (Vin.I,200). The root of this plant has a fragrance reminiscent of violets and is used in confectionery, perfume and in medicine for its stimulant, cathartic and diuretic properties. Sweet flag does not grow in northern India and must have been imported, probably from Kashmir or Persia. The Buddha considered it to be the most fragrant of all roots (S.III,156). The rhizome of sweet flag is chewed as a cure for colds and to alleviate asthma and is made into a tonic. The root is used as a vermifuge and for fever.

Vacattha. The root of a plant used as a medicine (Vin.I,200).

Vajuḷa. *Saraca indica* (Ja.V,420). A medium-sized tree with dark-green leaves and beautiful orange and scarlet flowers. The 19th century botanist Roxburgh said of this tree '...when in full bloom, I do not think the whole vegetable kingdom affords a more beautiful object'.

Vaṭarukkha. See **Nigrodha**.

Vatṭakā. See **Kapiñjala**.

Vanakāka. See **Kāka**.

Vanamahasa. See **Mahisa**.

Vantāda. See **Kāka**.

Varaka. See **Kalāya**.

Varaṇa. Hindi *varuna*, *Crataeva religiosa* (Ja.I,222; 317). A small spreading tree which bears masses of beautiful white, yellow or sometimes pink flowers.

Vararukkha. See **Nigrodha**.

Varāha. Wild boar (Dhp.325; Th.101). See **Sūkara**.

Valli. A general term for creepers, climbers and vines (Ja.V,37; Vin.III,144). See **Lāta**.

Vallibha. Uncertain, but perhaps *Averrhoa bilimbi*, Hindi *bilimbi* (Ja.VI,536). A small attractive tree producing a yellowish, sharply five-angled fruit. The juice of this fruit is made into a refreshing fruit drink and also used to remove stains from clothes.

Vassikā. Sometimes also *vassikī*, this plant is often identified as jasmine (Dhp.377). However it is more likely to be *Justicia adhatoda*, Bengali *vasaka*. This bushy shrub grows up to 2.5 metres high and has elliptic leaves, large white fragrant flowers and is commonly grown in gardens. The flower was made into garlands (M.I, 32) and was considered the most fragrant of all flowers (A.V,22). The Buddha said: 'Of all fragrances, sandalwood, *tagara*, blue water lily or *vassikī*, the fragrance of virtue is the best' (Dhp.55). See **Sumanā**.

Vātaghata. A type of tree, sometimes also *vātaghatāka* (Ja.V,407; IV,298). The name means 'wind destroying' and may refer to the tree's ability, when taken as a medicine, to dispel bodily wind.

Vātamiga. A type of animal (Ja.V,416; VI,538).

Vātingaṇa. Egg Plant, Hindi *baingan*, *Solanum melongena* (Ja.V,131). An erect plant with large elliptic leaves, prickles on the stem, branches and underside of the leaves and an elongated oval fruit which can be eaten. The fruit, either creamy-white, yellow or deep purple, can be very large in cultivated plants but is small in those growing wild. The egg plant probably originated in India.

Vānara. Hunuman Langur, also sometimes *kapi* or *gonāṅgula* (Th.113; 601) *Semnopithecus entellus*. This large primate has a silver-grey body with a white belly and a black face. With its long limbs and tail the langur moves through the trees or along the ground with a series of graceful bounds. Langurs have hands, feet and faces resembling those of humans (Ja.III,73). The Buddha said that the distracted person ‘jumps from here to there like a langur searching for fruit in the forest’ (Dhp.334). Sometimes they were kept as pets (Ja.II,184). The Jātaka describes a troop of langurs raiding a *tiṇḍuka* tree on the outskirts of a village (Ja.II,76).

There is intense competition to become the dominant male and one that does will immediately try to kill all the young so that the females will come into estrous and he can mate with them. This behaviour seems to have been noticed by the ancient Indians and is probably the basis of the Tayodhamma Jātaka (Ja.I,280-2). In this story the dominant male of a troop of langurs castrates with his teeth all the infant males out of fear that they may grow up and replace him. In a story meant to illustrate the idea that greed can make one blind to one’s own benefit, a Jātaka tell of a langur who lets go of all the beans it had just to retrieve one that it had dropped (Ja.II,74).

Vāyasa. See **Kāka**.

Vāraṇasāyana. A type of tree (Ja.VI,535).

Vārija. See **Maccha**.

Vālaja. An aquatic creature, probably a fish (Ja.IV,70; 278).

Vālamaccha. A type of freshwater fish (Ja.III,70; 345). The word *vāla* can have several meanings including ‘hair’, ‘unpleasant’ or ‘water.’

Vāḷa. Sometimes *vāḷamiga*, a term for predatory animals (A.III,102; Ja.VI,569).

Vāsanti. A type of flowering shrub (Ja.VI,537). The name means ‘belonging to spring’.

Vighāsāda. ‘Eater of others’ remains’. This was perhaps a general term for scavengers such as vultures and hyenas, jackals, crows and dogs (Ja.I,348; VI,538).

Vicchika. Scorpion, Hindi *bricchak*. A insectivorous anthropoid of the order *Scorpiones*, of which there are about 40 species in India (A.II,73; III,101). Ranging in colour from tawny-brown to blue-black, scorpions have two claws and a long segmented tail that can grow up to 20 cm. long and with a sting on its tip. During the rainy season, when scorpions are driven out of their holes by the water, people are more likely to be stung by them. The sting is extremely painful and can occasionally even be fatal. The Buddha mentioned the scorpion as an example of a creature that moves stealthily, especially when they sense human presence (A.V,289). Knowing antidotes for scorpion stings was considered a special skill (D.I,9). The *Milindapañha* says the scorpion’s tail is its weapon which it always keeps raised (Mil.394). We read that sandals were sometimes decorated with a design resembling a scorpion’s tail (Vin.I,186).

Vitacchikā. Scabies, sometimes *kacchū* (Nidd.II,304). Scabies is a skin infection caused by tiny mites of the genus *Sarcoptes* which burrow into the skin where they feed on blood. The mite’s excretion causes intense itching, especially at night. Scabies is highly infectious and was one of the afflictions that could attack the body along with dysentery, leprosy, eczema, boils, etc (A.V,110). The Buddha mentioned jackals suffering from a condition called *ukkaṇṇaka* which, judging by the name, had something to do with the ears (S.II,230). This would seem to be ear mange which is caused by the *Otodectes* and *Psoroptes* species of mite. The damage done to the ear by these mites is compounded by the infected animal’s continual scratching.

Vibhītaka. Belleric Myrobalan, Hindi *bahera*, *Terminalia bellerica*. A large common forest tree with a tall trunk, broadly elliptic leaves clustered at the end of the branches and greenish-white or yellow flowers. Together with *āmalaka* and *harītaka*, the fruit is one of the *triphala* or ‘three fruits’ long credited in traditional Indian medicine with powerful medical properties (Ja.VI,529; Vin.I,201).

Vibhedika. A type of tree (Ja.VI,529;537).

Vilaṅga. *Erycibe paniculata*. A large climbing shrub with yellowish-white flowers which grows along rivers and streams. The fruit of this shrub, a black berry, has a sweet dark purple flesh and was used as a medicine (Vin.I,201). The bark is also believed to have medicinal properties.

Vīhi. See **Tañḍula.**

Veṇu. See **Veḷu.**

Veṇutinduka. A type of tree (Ja.V,405).

Vetasa. Probably a type of cane (Ja.V,167). See **Vetta.**

Vetta. Cane, Hindi *bet*. Several species of cane palms grow in northern India, a common one being *Calamus tenuis*. This slender palm has feathery leaves and climbs up other plants by means of long flagella armed with small hook-shaped thorns. The Jātaka mention a cane thicket (*vettagahana*) so entangled that even a snake could not penetrate it (Ja.V,46). Cane was used to make stands, baskets, furniture and ropes, and a rod of cane was used to flog criminals (A.I,47).

Vedisa. A type of plant (Ja.V.405;VI,550).

Veluka. A type of tree (Ja.V,405).

Veḷu. Bamboo, also called *veṇu* and *vamṣa*, grasses of the genus *Bambusa* (Ja.V,38; Sn.38). Ranging in height from small to very tall and growing in dense clumps, bamboos have hollow segmented tube-like stems and branches from which grow long spear-shaped leaves. Over 30 varieties grow in northern India. Bamboo is an economically important plant, its strong but light and flexible wood being used for a wide variety of purposes. Washing was hung on bamboo poles and needle cases were made out of bamboo tubes. It was also plaited and woven into baskets (Vin.IV,6) and grown in lines to form hedges (Vin.II,154). Bamboo very rarely flowers, but when it does it dies (Ja.V,71; S.II,241). Its young shoots get tangled up with each other (Sn.38) and young bamboo shoots are already hard and difficult to tread down (Th.72). Workers in bamboo were considered low caste (A.II,85;III,385).

One of the Buddha's favourite resorts in Rājagaha was the Bamboo Grove, a park offered to him by King Bimbisāra (Vin.I,39). To this day dense thickets of the Thorny Bamboo, *Bambusa arundinacea*, grow around Rajgir, modern Rājagaha, and may be the type that was familiar to the Buddha. The ancient Buddhists believed that having the flexibility of bamboo would be a virtue. One Jātaka story comments that to live successfully in the royal court it is wise to 'bend like bamboo' (Ja.VI,295). Nāgasena said: 'Bamboo does not bend any which way, but the way the wind blows. Likewise the monk, having followed the nine parts of the Buddha's, the Lord's teachings and being established in that which is good

and blameless, should go the way of true asceticism' (Mil.372). The popular trick where a man holds a bamboo pole erect and a child ascends it and balances on the top, was sometimes preformed as an entertainment (S.V,168). A segment of bamboo, called a *nāli*, was used as a measure of capacity (Ja.IV,67; Vin.I,249). See **Khuddakaveḷu** and **Mahāveḷu**.

Vyaggha. Tiger, sometimes *byaggha*, Hindi *bagh*, *Panthera tigris* (A.III,101; D.III,25; Dh.295; Sn.416; Th.1113). This large majestic feline has an orange coat patterned with black stripes, a banded tail and black ears. Tigers live in thick jungle and thorny shrub where they hunt mainly deer. The tiger is not mentioned in the Vedas and only occasionally in the four Nikāyas. Perhaps they became common in northern India only as lions died out. In one place, the tiger is described as being striped and is called 'the king of the beasts' a term usually used for the lion (Ja.IV,345). We read of a man-eating tiger attacking travellers on the high road to Vārāṇasi (Ja.I,357). The Buddha sometimes stayed with a clan of people known as Tiger's Track, Vyagghapajjā (A.II,194). Royal chariots were upholstered with leopard or tiger skins (Ja.V,377; VI,503), a fact also mentioned by Pāṇini. In the Jātaka, there is a story about an accomplished but boastful magician who shows off his skill by bringing a dead tiger to life only to be eaten by it (Ja.I,510).

Vyagghinasa. A type of raptor (Ja.VI,538; S.I,148). The Pāli name means 'little tiger' and might refer to the Shahin Falcon, *Falco peregrinus peregrinator*. About the size of a crow, this powerful falcon has a grey back and wings, a black head, white chin and a rufous breast marked with horizontal black bars reminiscent of a tiger's stripes. The shahin falcon favours hilly areas and feeds mainly on other birds.

Vyaghinasa. A bird which the commentary describes as a type of hawk or falcon (*senā*, J.VI,538). If this is correct it could be the Booted Eagle, *Hieraetus pennatus*, Hindi *baghati*, a small brown-coloured eagle that feeds on small mammals and other birds. Booted eagles hunt in pairs.

S

Sakuṇa. See **Pakkhin**.

Sakuṇagghi. The word literally means ‘bird killer’ and was probably a general term for hawks and falcons (Ja.II,59; S.V,146).

Sakunta. A general term for vultures (Dhp.92; Ja.IV,225; Sn.241). See **Gijjha**.

Sakula. Stripped Snakehead or Common Snakehead, *Ophiocephalus striatus* (Ja.V,405). Found in either fresh, brackish or salt water, this fish is dark brown with chevron-like markings and grows up to 90 cm. long. The pectoral fin takes up about half the body. Its head resembles that of a snake and hence its English name. The snakehead eats worms, frogs and especially other fish, aggressively lunging at its prey and swallowing it whole. The snakehead is the most popular food fish in northern India.

Sagga. Asian Brown Flycatcher, Hindi *zakki*, *Muscicapa dauurica* (Ja.VI,538). A greyish-brown bird about the size of a sparrow with white ring around its eye and a white throat and flanks. This flycatcher lives in open forest and village gardens and mainly eats large insects.

Sañkha.¹ A type of water plant sometimes mentioned together with *sevāla* and *pañaka* (Vin.III,177).

Sañkha.² Conch, also called *kumbu*, Hindi *sankh*, *Turbinella pyrum*. A marine mollusk with a particularly thick shell which can be polished to a brilliant white (Ja.III,447; V,203; Thi.262), as white as milk (Ja.VI,572). Conch shells were considered one of the many precious things found in the ocean along with pearls, gems, beryl, crystal, coral, gold and silver, ruby and emerald (Ud.54). During coronation ceremonies water from three conch shells was sprinkled on the monarch’s head (Ja.II,409; IV,493). They were blown as trumpets and sometimes played together with a small drum (Ja.IV,21). The sound of a conch carried far (D.I,79; 252). The innermost spiral of the shell could be used as a tube (Vin.I,203) and rings of conch were used as bracelets and anklets. Shells spiralling to the right, which are extremely rare, were considered particularly auspicious (Ja.IV,350). To have three wrinkles on the neck like the lines of the spiral on a conch was considered a sign of beauty (Ja.V,155; IV,130). A young woman was

described as having limbs 'as smooth as a conch shell' (Ja.V,204). Conch shells are burned and the resulting powder is used as a medicine. According to the *Mahāvastu*, some of the things made out of conch included armlets, vessels for holding oil, perfume and paint, lids, necklaces and girdles (Mvu.II,473). The Buddha described the life of a sincere disciplined monk as being 'perfectly clean, perfectly pure and polished like a conch shell' (A.V,204; D.I,63). Conchs were harvested mainly in the Palk Straits between the southern tip of India and Sri Lanka, from where they were imported to northern India. According to the Jātaka, the Bodhisatta was once a conch blower (Ja.I,284).

Saṅkhamutta. Nacre or mother-of-pearl, the beautiful pearl-like inside of marine bivalve mollusks of the genus *Pinctada* (Ja.V,380; Thi.278). Several species of this bivalve, particularly *Pinctada margaritifera* are found down the east coast of India and are harvested for their shell. Mother-of-pearl was used to make jewelry. See **Mutta**.

Sajjulasa. See **Jatu**.

Satapatta. See **Sārāsa**.

Satapatha. A type of bird (Ja.II,153; Mil.II,404).

Satapadi. Centipede, Hindi *sata*, *Scolopendra subspinipes* (A.II,73). Like its English equivalent, the Pāli name for this creature means 'a hundred legs'. Centipedes are arthropods of the class *Chilopoda* found throughout India and were one of the many creatures that forest-living monks had to be careful of. A bite from a centipede could be extremely painful or even fatal (A.III,100). The Buddha mentioned the centipede as an example of a creature that moves stealthily (A.V,289).

Satapuppha. Indian Dill, Hindi *sowa*, *Anethum sowa* (Ja.VI,537). A small plant closely resembling fennel and when in flower covered with beautiful white blossoms. An oil extracted from the seeds is given to children to treat flatulence.

Satavaṃsa. See **Maccha**.

Sattapatta. Wookpecker. See **Koṭṭha**.

Sattapaṇṇa. Scholar's Tree, *Alstonia scholaris* (Ja.VI,269). A attractive medium to large-sized tree with small whitish-green flowers and is often grown for shade. It has a rosette of leaves at the end of the branches, the

number of leaves in each rosette ranging from five to nine, but most commonly seven and hence the tree's Pāli name, 'seven-leaf', in Hindi *saptaparni*. According to the commentaries, the cave in Rājagaha where the First Buddhist Council was held, took its name from the scholars tree (Vin.II,76). In the past, children's writing boards were made from the wood of this tree which gave it its English name.

Sattali. A flower sometimes used to make garlands (Ja.IV,440).

Saddala. See **Tiṇa**.

Saddūla. See **Dīpi**.

Santha. See **Naḷa**.

Sappa. Snake, also called *aṇḍaja*, 'egg born', *ahi*, *āsivisa*, *dijivhā*, 'two-tongued', *nāga*, *pannāga*, *pādūdara*, 'whose belly is a foot', *bhogī*, *bhujaga*, *bhujāṅga*, *bhujāṅgama*, *mahoraga*, and *uraga* (A.III,97; Ja.III,347; M.I,130; Sn.1;604; Th.429). Snakes were also sometimes known as *maṇḍūkabhakkha* 'frog-eaters' (Ja.III,16). It is uncertain whether all these words are synonyms or refer to different species of snakes. Snakes are legless, long-bodied reptiles of the suborder *Serpentes*. In Jain literature snakes are classified as either with or without a hood, while the Buddha classified them as either venomous and docile, non-venomous and aggressive, venomous and aggressive or non-venomous and docile (A.II,110).

The ancient Indians made some attempt to identify sexual dimorphism in snakes. It was believed that the male's tail was thicker than the female's, their head was broad while the female's was elongated, they had larger eyes and their head was rounded while the females was short (Ja.VI,339). According to herpetologists, in most species females are of equivalent or larger size than males while the latter typically have longer tails than the former.

Snakes shed their skins (Sn.1), have forked tongues, long backs, crawl on their bellies (Sn.604) and are commonly found living in anthills (S.IV,199). The reverence people had for snakes was mixed with fear and disgust (Vin.I,219). The Tipiṭaka contains several accounts of people being bitten by snakes and dying (A.II,70. Vin.II,150; IV,166). People wore charms to protect themselves from and to cure snake bites (Ja.IV,31). A doctor could give medicine against a snake bite or force the snake to suck the poison out of the wound (Ja.I,310). One cure for a snake bite was a concoction of cow dung and urine, ash or clay (Vin.I,206).

The Buddha said that one should be careful even of young snakes. 'One should not dismiss the snake one might see in village or forest just because it is young. That snake, fierce, sliding along, with serpentine

movements, may attack and bite the foolish man or woman. Therefore, protect your life and avoid that snake' (S.I,69). Not everyone tried to avoid snakes. We have an account of children tormenting a snake, probably a small one, with a stick (Ud,11). The Buddha described some species of snakes as being dirty and odorous, terrifying, dangerous and given to betraying their friends (A.III,260). To catch snakes charmers would pin their heads down with a forked stick and then grasp them by the neck (M.I,134). The Snake River, Sappinī, at Rājagaha was so named because of its winding serpentine course (A.II,29). It was believed that some snakes were born in the Himalayas from where they migrated down the streams and rivers to the sea and then grew into sea monsters (S.V,47). Several types of water snakes are mentioned (Ja.II,238), in particular the *alagadda* which is described as being venomous (M.I,133).

The Jātaka mentions a snake with a copper-coloured or red head (Ja.VI,194) which can only be the Copper Head, *Elaphe radiata*. This large handsome snake has a copper-coloured or orange head with a black stripe over it and a yellowish-brown body with three black stripes down the sides. The copper head prefers open country near jungles and undergrowth and is often seen in fields and near villages where it feeds almost exclusively on rodents. The Jātaka correctly point out that the copper head is non-venomous. See **Agārasappa**, **Ajakara**, **Udakasappa**, **Kaṇhasappa**, **Dedḍubha** and **Silābhu**.

Samuddakappāsī. Bengal Cotton, *Gossypum neglectum*. A a pyramidal bush with leathery furrowed and corrugated leaves, reddish stems and yellow flowers with a purple centre (Ja.VI,537). The bush gives an inferior cotton but is hardy and easily grown.

Sambuka. See **Sippi**.

Samsādiyā. A type of grain or grain-bearing plant (Ja.VI,530).

Sayaṃjātasālī. See **Nivāra**.

Sara. Hindi *sar*, *Saccharum sara* (S.IV,198). The Pāli name means 'arrow'. This grass grows in large tufts up to 5.4 metres high and is usually found along river banks although the Buddha commented that it grew thick in forests too (D.III,75). It was used to make ropes, mats and to stuff mattresses (Vin.IV,39). The stem of the flower is light, strong and straight and was used as the shafts for arrows.

Sarabha. A deer, probably the Sambar, *Cervus unicolour*, India's largest and most common deer (Ja.IV,267; VI,537). The sambar has a shaggy brown

coat, large spreading antlers and favours deciduous forest and grassland scrub, near water if possible. When alarmed it makes a loud 'donk donk' call and when pursued by predators. The legs of thrones were made to look like the legs of the sambar (Ja.III,342) and we read of these animals being annoyed by biting insects (Ja.I,267; III,401). See **Sāmāmiga**.

Sarabhū. Indian Chameleon, Hindi *sarab*, *Chamaeleo zeylanicus*. Growing up to 350 millimetres long the Indian chameleon has a laterally compressed body, a conical casque on the top of its head and large eyes. Its skin is covered with granular scales and is normally green with yellow and black bands and spots but can change colour very quickly when the creature is excited. Indian peasants have a superstitious dread of chameleons, mistakenly believing them to be poisonous. When a monk died of a snake bite, the Buddha taught the others to chant some verses that would protect them from noxious creatures, including chameleons (A.II,73).

Sarala. Long-leaved Pine, *Pinus longfolia* (Ja.V,420). A large tree with symmetrically whorled branches high on the trunk which form a rounded crown. The Buddha commented that the leaves of this tree are not suitable for making into containers to carry things in (S.V,438).

Saravana. See **Naḷa**.

Salabha. A type of insect. The Udāna mentions that one evening as the Buddha sat in the open air he noticed swarms of these insects being attracted to the oil lamp and then falling into it (Ud.72). The same habit is said of this creature in Sanskrit literature. This suggests that the *salabha* is a moth. However, the word commentary on the Jātaka and numerous Sanskrit sources say that swarms of *salabha* sometimes destroy crops (Ja.V,401) suggesting that locusts or grasshoppers are being referred to. During the monsoon in northern India swarms of small grasshoppers, crickets and beetles often join moths in buzzing around any light source. See **Paṭanga**.

Salāḷa. A type of fragrant-smelling tree (Bv.11,51; Ja.I,13; V,420; S.V,300). See **Sallakī**.

Sallaka. Indian Porcupine, Hindi *sayal*, *Hystrix indica* (Ja.V,489). A large thickset rodent covered with long black and white striped quills, the porcupine lives in forests and tall grass where it digs burrows and feeds off fruit, tree bark and roots. They also sometimes raid crops. When threatened, the porcupine erects and then rattles its quills as a warning.

The porcupine's name is derived from *salla*, 'arrow', not because its quills resemble arrows but because of the widespread folk belief that it can shoot its quills. Porcupines are one of the animals mentioned in Asoka's 5th Pillar Edict as being protected.

Sallakī. Indian Frankincense, perhaps also *salala*, Hindi *salag* or *salai*, *Boswellia serrata* (Bv.11,25; Ja.IV,92; VI,535). An attractive medium-sized tree with green, reddish or grey bark that peels off in thin flakes and small whitish flowers at the tip of the branches. The flowers only appear when the tree has lost all its leaves. The fragrant golden-coloured and translucent resin that oozes from the trunk has been used as an incense for thousands of years. The leaves of the Indian frankincense are hung up in cow stalls to drive away flies. Real frankincense, which is produced in the southern Arabian Peninsular, was imported into India. It is not mentioned in the Tipiṭaka.

Savamka. See **Maccha**.

Sasa. Indian Hare, also called *sasaka*, Hindi *sasa*, *Lepus nigricollis*. This common animal has a reddish-brown coat with black hair mixed throughout and white under parts. Hares have long ears (Ja.V,416) and when captured they tremble with fear (Dhp.342). To refer to something as a 'hare's horn' meant that it was impossible or absurd (Ja.III,477). To be 'as small as a hare's whisker' was to be insubstantial (Ja.IV,233). When the ancient Indians looked at the moon they saw not the face of a human but a hare and a Jātaka story tells how the image of this animal got there (Ja.III,51-5; IV,86; VI,539).

Saha. *Barleria prionitis*. A thorny bush with elliptic spine-tipped leaves and bright-yellow flowers (Ja.VI,269). Although wild, the bush is sometimes grown in gardens.

Sāka. Indian Teak, Hindi *sagwan*, *Tectona grandis*. A large tree growing up to 46 metres in height and with a straight often buttressed trunk, a spreading crown, large elliptic leaves and white flowers. The yellow to brown heartwood is easily worked, resistant to decay and retains its fragrance for years. In a simile the Buddha suggested that what Brahmins are to the social order, teak wood is to timbers, i.e. superior (M.II,129-30). The Indian teak is now rare in the wild but is often grown in plantations. There was a legend that the Sakyans, the tribe the Buddha came from, derived their name from this tree. The Buddha once related this legend to Ambaṭṭha:

'In days of old, so say those who remember their family lineage... King Okkāka who loved his queen and wished to transfer the kingdom to his son by her, banished his earlier sons, Okkākumha, Karaṇḍu, Hatthiniya

and Śinipura. Being thus banished, they settled at the foot of the Himalayan foothills beside a lotus pond where there was a *sāka* forest. Not wanting to degrade their lineage, they cohabited with their own sisters. King Okkāka asked his ministers and advisers: “Where are they living now?” and when they told him he said: “They are strong as *sākas*, they are real Sakyans!” and this is how the Sakyans got their well-known name.’(D.I,92-3)

Sākhāmiga. Branch creature (Ja.II,73; V,416), a term for monkeys. However, as squirrels are often called *sakha mrig* in Hindi the term may have been used for them too.

Sākhassita. Branch dweller (Ja,V,233). A term for monkeys but perhaps used for squirrels too.

Sāṇa. Sun Hemp, Hindi *san*, *Crotalaria juncea* (D.II,350; M.I,78). A small shrub with long leaves, velvety pods and a yellow flower. Sun hemp grows wild but is also cultivated for its strong fibres. Mahā Kassapa’s rag robe was made out of sun hemp (S.II,202). Elephants would gather clumps of this plant in their trunks, take them into the water and thrash them about to get the dirt out of the roots before eating them (M.I,375).

Sātaka. A type of bird (Ja.VI,538).

Sāmalatā. A type of flowering creeper (Ja.I,60).

Sāmā. A type of plant (Ja.IV,92; V,405).

Sāmāka. Hindi *sawan*, Bengali *shama*, *Panicum frumentaceum*, (A.I,295; Ja.I,500; IV,371; V,405; Sn.239). A variety of millet with a cream-coloured grain which is eaten and also used as fodder. A gruel consisting of *sāmāka*, *nivāra* and the leaves of some other herbs was given as a cure for bloody dysentery (Ja.III,144). See **Kaṅgu**.

Sāmāmiga. This name means dark or black deer (Ja.II,44). It is not clear whether this refers to a species of deer or a particular individual animal. However, the sambar ranges in colour from yellowish-brown to dark grey and is sometimes known in Hindi by the alternative name *samar*. See **Sarabha**.

Sāyana. *Echinochloa frumentacea*. A erect grass usually found growing in mud at the edges of rivers and ponds. The plant’s cream-coloured seeds are used for fodder and sometimes eaten. A Jātaka describes *sāyana* growing at the edge of the Mucalinda Lake (Ja.VI,535).

Sāra. A type of tree that gives good timber (Ja.III,318).

Sāla. Sal, *Shorea robusta*, also sometimes called *assakaṇṇa* because the long spatula-shaped sepals enclosing the flower resemble a horse's ear (Ja.II,161; VI,528). The sal is a majestic tree growing up to 45 metres in height and having a girth of 3.6 metres, with ovate oblong leaves and pale yellow flowers. The sal and its flower are often referred to in the Tipiṭaka (Th.948). It has dark green leaves, a straight trunk and is beautiful to see (Ja.V,251). The huge sal trees that grew in the lower reaches of the Himalayas are described as having leaves and foliage, bark and shoots, softwood and heartwood (A.I,152).

The Tipiṭaka describes how a man would make a boat out of a sal trunk. First he would locate a large tree in the forest and cut it down with his axe. After shaping the exterior and hollowing out the inside, he would then further shape it with a scraper and then smooth it with a rock ball. Finally, he would fix a rudder, make a pair of oars and then slide it down to the river (A.II,201). The Buddha describes a man going to a sal forest near a village and cutting down the other trees and the crooked sal saplings so that the already well-established sal trees would grow bigger and straighter (M.I,124). Sal trees were sometimes strangled by parasitic vines (Dhp.162; Ja.V,452).

The Rukkhadhamma Jātaka uses the thickness of a sal forest to illustrate the advantages of unity. King Vessavaṇa asked all the tree spirits to select for themselves a plant as their home. The Bodhisatta, who had been reborn as a tree spirit, advised his kinsmen to avoid trees that stood alone and pick those that grew close to others. Some did as he advised, making their homes in a thick sal forest, but others moved into isolated trees growing near towns and villages thinking that they would receive offerings humans made to such trees. One day a mighty storm swept over the country uprooting even the mightiest and most deeply rooted trees growing in the open. But the sal trees in the forest, supported by each other and with their branches interlaced withstood the storm (Ja.I,328-9).

When the Buddha arrived in Kusinārā on his last tour and lay down between two sal trees, they burst into flower out of season and sprinkled their petals over him. When Ānanda expressed amazement that the very trees were revering him, the Buddha said: 'Ānanda, these sal trees burst into flower out of season in homage to the Tathāgata and covered his body but the monk or the nun, the lay man or the lay woman who lives practising the Dhamma properly and perfectly fulfills the Dhamma, they honour, revere and respect the Tathāgata with the highest homage' (D.II,137-8). In the light of this story and the traditional belief that the Buddha passed away during Vesākha, it is interesting to note that the sal usually blossoms in March-April and occasionally in May.

The Buddha once said that his Dhamma was so convincing that if the great sal trees had consciousness and could comprehend, even they would benefit from it (A.II,194). One moonlit night, Ānanda and Revata went to visit Sāriputta at the sal forest of Gosīṅga which was 'delightful with all the trees in full bloom and with a heavenly fragrance wafting through the air' (M.I,212). Sometimes gruel was made from or flavoured with sal flowers or perhaps its resin (A.III,49). The sal was and continues to be even today an important source of timber in India. Oil distilled from the seeds is used for lamps and the resin which exudes naturally or is sometimes tapped is used as a medicine, to make incense and also a perfume called *dammar* in Hindi. Sal butter, which is extracted from the seeds, is used as substitute for cocoa in the manufacture of chocolate. The past Buddha Vessabhū attained enlightenment under a sal tree (D.II,4).

Sālakalyāṇī. A type of sal tree under which the past Buddha Koṇḍañña attained enlightenment (Bv.3,31). The name means 'beautiful sal.' According to a verse in the *Milindapañha* the roots of this tree reach into the earth for a hundred cubits and at maturity they shoot up into the air for a hundred cubits in a single day (Mil.376).

Sāli. See **Taṇḍula.**

Sāliya. Common Hill Myna, sometimes *sālīkā*, or *sāliyāya*, *Gracula religiosa* (Ja.III,202; VI,421; 425). The Pāli means 'rice bird' Although called *pahari myna* in Hindi and Bengali most other species of myna are called *salik* in those languages. The hill myna has glossy-black plumage with white patches on the wings, bright yellow patches of skin, wattles below its eyes and yellow beak and legs. It lives mainly in the hills that border the northern edge of the Ganges valley and feeds on fruit. It has a loud although not unpleasant warbling creaking song and is very good at imitating human speech (D.III,202) which even today makes it a popular cage bird. Vaṅgisa said that the Buddha's voice was sweet like that of the myna (Th.1232), and Sāriputta's voice was described similarly (S.I,190). Teaching mynas and parrots to speak is mentioned in the *Kāma Sūtra* as a pleasant pastime. According to the charming *Tesakuṇa Jātaka*, Ānanda was reborn as a myna and together with an owl and a parrot, instructed a king on how to be a good and just ruler (Ja.V,110 ff).

Sāliyavaka. See **Taṇḍula.**

Sāluka. See **Sogandhika.**

Sāleyyaka. A type of plant (Ap.346).

Sāsapa. Indian Mustard, Hindi *sason*, *Brassica sarson* (A.V,170; S.II,137). A small annual shrub with a bright-yellow flower and numerous tiny round black seeds from which a pungent edible oil is extracted. Sores were sprinkled with mustard powder (Vin.I, 204). The Buddha said that craving will not persist in a good monk any more than a mustard seed will balance on the point of a needle (Dhp.401; Sn.625). See **Rājikā** and **Siddhatthaka**.

Sikhandi. See **Mayūra**.

Simsaka. A type of water plant, perhaps the same as *siṅghātakā* (Ja.VI,536).

Simsapā. Hindi *shisham* or *sissu*, *Dalbergia sissoo*. This large handsome deciduous tree has ovate leaves, their broader ends towards the base and about twice as long as broad. The flowers are small and yellowish. They are widely grown for their fine timber and along roads for shade or on common ground around villages. When in Ālavī, the Buddha once stayed in the nearby *simsapā* grove where he slept on the leaf-strewn ground (A.I,136). There was another such grove at Setavya (D.II,316). Once, while staying in a *simsapā* grove near Kosambī, the Buddha gathered up a few leaves and asked the monks: ‘Which are more numerous, this handful of leaves or those on the trees above?’ ‘The leaves in your hand are few while more are the leaves on the trees’ replied the monks. Then the Buddha said: ‘Likewise, the things I have discovered but not taught are numerous while the things I have taught are few. And why did I not teach all these things? Because they are useless, irrelevant to living the holy life and do not lead to turning away, dispassion, cessation, peace, higher knowledge and Nirvana’ (S.V,437-8). Today, the *simsapā* is one of India’s main timber trees.

Sigāla. Jackal, also called *bheraṇḍa kotthu*, *kotthuka*, *kotthusuna* and *siṅgāla* (Ja.II,107; V,270), Hindi *siyal*, *Canis aureus*. A medium-sized dog-like animal with a scraggy grey-brown coat, the jackal is both a scavenger and a predator. They could be seen sitting by rivers waiting for fish (M.I,334) or prowling up and down the banks looking for prey like tortoises (S.IV,177). They would also eat frogs and mice around the threshing floors in harvested fields (D.III,26) and enter cities at night through the sewers to scavenge in the garbage heaps (Ja.III,415). Jackals were often seen in the company of lions and lived on the remains of their prey (D.III,24). The yelp of the jackal cannot be compared with the roar of the lion (A.I,187), rather, it was considered pathetic and comical. The Buddha mentioned an old jackal howling at night because it was afflicted

by mangle (S.II,230). Jackals often feature in the Jātaka stories (e.g. Ja.I,425; 460; 491; II.6; 354; III,113).

Siggu. See **Sodhañjanaka.**

Sigru. See **Sodhañjanaka.**

Singāla. See **Sigāla.**

Singila. Probably a name for one or another of the four species of ‘horned’ owls found in northern India. According to the Jātakas, the Bodhisatta was once reborn as one of these birds (Ja.III,73). See **Kosika.**

Singivera. Ginger, sometimes also *adda* or *pakkhipati*, *Zingiber officinale* (Vin.IV,35). The Pāli name means ‘horn-shaped’. Ginger is a slender herb growing from a stout nodular horizontal rhizome and has a greenish flower with a purple lip. The roots are fleshy golden-yellow with a tangy odor and taste and are used as a medicine (Vin.I,201) and in cooking (Ja.III,225). Today the pale-yellow oil extracted from it is used in perfumes and medicines. Xuanzang noted that monks at Nālandā began their meals with salted fresh ginger.

Singu. A type of fish, Hindi *singi*, *Heteropneustes fossilis* (Ja.VI,537). The Pāli name is derived from the word meaning ‘horn’ or ‘barb’ and refers to the large serrated barbs on the fishes pectoral and dorsal fins. These barbs can inflict serious injuries and are usually broken off as soon as the fish is caught. This fish is commonly eaten.

Singhāṭaka. Water Chestnut, Hindi *singhada* or *paniphal*, *Trapa natans* (Ja.VI,530). The roots of this annual aquatic plant grow in the mud while the leaves float on the surface of the water, often forming a thick mat on ponds and tanks. The large seed has long thorns on either end and a tough black skin which can be peeled off to expose a white, starchy and pleasant-tasting kernel. The water chestnut is very fast-growing and is commonly cultivated in village ponds.

Sithilahanu. Asian Openbill Stork, *Anastomus oscitans*. This small stork is white or greyish with black wings and orange legs. The mandibles of the reddish-black bill are slightly arched, creating a gap between them and thus the Pāli name meaning ‘slack-jawed’. The openbill stork is commonly found throughout India. Its feathers were used to make flights for arrows (M.I,429).

Siddhatthaka. White Mustard, *Brassica campestris* (Ja.III,225; VI,537). An erect stout herb with a blue-green flower and pods and that yields numerous small round reddish-brown seeds from which an oil is extracted. A white mustard seed gets a mention in one of the most famous incident in the Buddha's life. Once a young woman named Kisāgotamī lost her child and mad with grief she ran through the town pleading with people to give her medicine for her child. Eventually she came to the Buddha who gently told her to get a white mustard seed from a house in which no one had ever died. Thinking that this seed would miraculously revive her child she went from house to house asking for one. Everyone was willing to give her one of the tiny seeds but when she asked if anyone had ever died in the house she was always told that someone had. Slowly it dawned on Kisāgotamī that death is an inevitable part of life and her grief gave way to acceptance and understanding (Dhp-a.II,273 ff).

In ancient India white mustard was widely used as an ingredient in medicines for children's diseases. It was also a common component in rituals meant to protect children from malevolent influences. This suggests that the storyteller's choice of a white mustard seed in the Kisāgotamī story was not random or incidental but was used to make the reader initially think that the Buddha was going to cure the child by conventional means.

Sinduvārīta. Hindi *nisinda*, *Vitex leucoxydon* (Ja.IV,440; VI,269), a large shrub with a white flower which usually grows on the banks of rivers and tanks. The *Buddhacarita* says that a bush called *sinduvāra* growing on the bank of a pool resembles 'a fair woman reclining and clad in fine white cloth' (Bc.4,49).

Sippī. The shell of freshwater or marine mollusk sometimes also *sippika*, *sambuka*, *sotti* or *sutti*. These names seem to have been used loosely as are their Hindi equivalents *sippa*, *sambuk* and *sukti*. The Freshwater Mussel, *Lamellidea marginalis* (A.III,395; D.I,84; M.II,22), is a bivalve commonly found in rivers, ponds and paddy fields throughout northern India. Its rounded elongated shells are dark-brown on the outside and pearly-white on the inside. The *cunṇa* often mentioned as an abrasive in the toilet was probably made from ground shells. Sometimes it was perfumed (A.I,208; Ja.I,290; Vin.I,47). Another abrasive, *samuddaḥṇaka*, may also have been made of shell or even of cuttlefish bone (Vin. II,130). The Buddha said that if a man were to look into a pool of clear, still unstirred water he would be able to see mussel shells, pebbles and gravel (A.I,9).

The shell of the cowrie, a marine mollusk of the family *Cypraeoidea*, was known in ancient India. Cowrie shells are humped with flattened bottoms. The opening of the shell has inrolled lips with tooth-like ridges on both sides. The underside is usually white, cream or yellow and

the top is glossy and usually speckled. Cowrie The shells used as money were probably cowries (Ja.I,426). The human vagina was compared to the mouth of the cowrie shell (Ja.V,197).

Sibala. Uncertain but perhaps the Balloon Vine, *Cardiospermum halicacabum*, Bengali *sibjhul* (Ja.VI,535). This plant is a common annual herb with white flowers.

Simbali. Red Silk-Cotton Tree, sometimes also *siṅhali*, Hindi *simal*, *Bombax malabaricum* (Ja.III,398; IV,430; M.III,185). A large prickly tree with silvery-white bark, finger-shaped leaves and large, fleshy, bright red flowers which appear when the tree is leafless. The pods contain seeds embedded in a silky wool and the gum that oozes from trunk is used to treat diarrhoea. We read of parrots living in a grove of silk-cotton trees (Ja.IV,277). An infernal variety of this tree called *koṭisimbali* was believed to grow in purgatory (Ja.V,453). It had thorns sixteen finger-breadths long (Ja.V,269) which no doubt inflicted suffering on the purgatorial beings.

Siriṃsapa. Creepy Crawlies, a term for reptiles and perhaps insects (A.II,73; D.II,57; M.I,10; Sn.52). See **Kīṭa**.

Sirinigguṇḍī. A type of tree, perhaps the same as *nigguṇḍī* (Ja.VI,535).

Sirīsa. Sometimes *sirisa*, Bengali *siris*, *Acacia sirissa* (Ja.VI,535), a large attractive tree bearing sweet-smelling crimson flowers with distinctive long pedicels. The *sirīsa* is often grown along roads for shade and is most noticeable when leafless and covered with pods. These pods were said to break open similar to the way *kimsuka* pods do (S.IV,193). The previous Buddha Kakusandha was enlightened under a *sirīsa* tree (D.II,4).

Silābhū. A snake described in the commentary as 'green leaf-coloured' (*nālapaṇṇavaṇṇa*) and thus probably refers to the Vine Snake, *Ahaetulla nasuta* (Ja.VI,194). This slender snake is bright green above, a lighter green below and has a distinctive pointed snout. Growing up to 1.8 metres in length it is usually found in trees and bushes where it feeds on birds, small mammals and lizards. When first caught the vine snake is very fierce but soon calms down and can be handled with ease. The vine snake is mildly poisonous, although its bite usually has no effect on humans.

Silutta. A snake described in the commentary as a 'house snake' and thus it may be the same as *agārasappa* (Ja.VI,194).

Sīha. Asiatic Lion, also *migābhibhū*, 'the lord of the beasts' and *migarāja*, 'the king of beasts', Hindi *singh*, *Panthera leo persica* (D.III,23; Ja.II,244;

Sn.684). The Asiatic lion is a large, stately, tawny-coloured cat with a long tail with a tuft at the end. It differs slightly from its African cousin, being smaller and having a fringe of hair down its abdomen and in the males a less luxuriant mane. The lion's preferred habitat is dry jungle and open grassland where they hunt deer and sometimes domestic cattle.

The Buddha said that of all animals the lion is the best in respect to strength, speed and courage (S.V.227), and a bold, confident person was called a lion-like man or was said to be as fearless as a lion (Ja.I,273; V,32). Lions were described as 'five-pawed' (*pañcahattha*), the mouth being the fifth 'paw' (Ja.V,425). Being a noble creature, they always lie on their right sides, with one paw on the other and with their tails between their thighs (A.II,245). The male lion emerges from its lair in the evening, stretches, looks around, roars three times and then goes in search of prey (A.II,33). When other animals hear the lion's roar they are frightened: 'Those who live in burrows descend into them, aquatic animals take to the water, forest dwellers make for the forest and birds take to the air' (A.II,33). When the lion strikes at its prey, whether it be an elephant, buffalo, ox, leopard, hare or cat, it does so with great skill (A.III,121).

In one place we read of monks finding and eating the remains of a lion's prey (Vin.III,57) and of monks being attacked and killed by lions. A preparation called lion oil was considered very valuable, but it is uncertain whether it was given this name because of its supposed potency or because it was actually made from lion tallow (Ja.I,98). There was a market for lion's hides, claws, teeth and fat (Ja.I,388; III,151; Vin.I,192).

Siha (Sanskrit *Siṅgha*) has long been a popular name in India. One of the Buddha's disciples, a general, was named Siha (A.III,38) as were several monks (D.I,151; Th.83). The Buddha himself said: 'Lion, monks, is a name for the Tathāgata, the Arahāt, the Fully Enlightened One' (A.III,122). When he lay down to rest or to sleep, the Buddha always did so in the 'lion posture', i.e. on his right side, with one foot on the other, mindful and fully aware (S.I,27;107). His bold and confident claim to be enlightened was called his 'lion's roar' (A.II,9). Two of the 32 special characteristics of the Mahāpurisa are that the front of his body is like that of the lion and his jaw like a lion's (D.II,18). Lions often feature in the Jātakas where they are depicted as either noble or fearsome creatures, but also sometimes as foolish or mean-spirited.

Even in the middle of the 19th century Asiatic lions were still found in the less populated parts of the Middle East and northern India but today the last 300 or so are restricted to the Gir Forest in Gujarat. See **Kālasīha** and **Kesari**.

Suṃsumāra. See **Kumbhīla**.

Suka. Parrot, sometimes also *suva*, Hindi *suka* (Ja.I,324). Three species of parrots live in northern India, the most common being the Rose-ringed Parakeet, *Psittacula krameri*. This beautiful bird has bright green plumage (Ja.VI,415), a red patch on its wing and a pink band on the back of its neck turning black towards the front. It also has a red beak, as do several other Indian parrots (Ja.III,492; IV,434). Flocks of these lively, noisy birds descend on crops and orchards where they do great damage. We have a description of a field watcher in Magadha frantically running around trying to scare off a flock of parrots that was eating the ripening rice (Ja.IV,277). People kept parrots as pets and fed them parched grain and honey (Ja.III,97). According to the Jātaka, the Bodhisatta was sometimes reborn as a parrot (Ja.II,132; 292; III,97; 491). See **Ciriṭa**.

Suṇa. See **Soṇa**.

Supāṇa. See **Soṇa**.

Sumanā. The name jasmine is used loosely for a wide variety of sometimes unrelated plants that produce small white star-shaped flowers with a particularly fragrant perfume. Most plants popularly called jasmine are of the family *Oleaceae*, genus *Jasminum*. The Pāli names *jātisumanā* (Ja.V,420), *mallikā* (Dhp.54), *sumanā* (Ja.I,62; VI,537), **vassika**, *vassikī* and **yūthikā** are usually translated as jasmine. There at least a dozen plants of the genus *Jasminum* that grow in northern India, the most common being *Jasminum sambac*, *J. pubescens*, *J. scandens*, *J. arborescens*, *J. strictum*, *J. caudatum* and *J. flexile*. All these plants are low shrubs with woody stems that have a tendency to climb and have small, simple or pinnate leaves. They all produce small, usually white but sometimes pink or yellow flowers. All grow wild although several are also cultivated. In the case of *J. sambac*, an essential oil is extracted from the flower and is used in incense and perfume. The *mallikā* was considered the most fragrant of all flowers (S.III,156). There is a reference to cloth with a *sumanā* and *mallikā* flower pattern printed or embroidered on it (Ja.I,62) and the Buddha asked his disciples to imitate the *vassika*: ‘Just as the jasmine sheds its withered flowers, so you, oh monks, should shed desire and hatred’ (Dhp.377).

Suriyavalli. A type of creeper (Ja.VI,536).

Sulasī. See **Tulasi**.

Suva. See **Suka**.

Suvāṇa. See **Soṇa**. *Gangetica*

Susu. Ganges Dolphin, Hindi *susu*, Bengali *susuk*, *Platanista gangetica* (Ja.VI,537). Like the Hindi and Bengali names, the Pāli one is an onomatopoeia for a hissing sound. The Ganges dolphin is a large cetacean varying in colour from slate-blue to muddy brown and with a long thin beak bearing a row of sharp interlocking teeth. The mouth curves upward at the end making it look as if the animal is smiling. This dolphin is found in the Ganges and Brahmaputra and their tributaries. Dolphins were hunted for their flesh and the oil rendered from their fat was used as a medicine. The Ganges dolphin is now critically endangered.

Susukā. Uncertain, but probably used loosely for crocodiles, gharials, the Ganges dolphin and sea monsters (A.II,123). The word may also have been used for the two species of sharks found in the larger rivers of northern India. The Ganges Shark, *Glyphis gangeticus*, has a rounded head, small eyes and ranges in colour from grey to greyish-brown. Although it only eats fish and carrion, its size and appearance may have led to the belief that it was dangerous to humans (M.I,460). The Ganges shark is now critically endangered. The Bull Shark, *Carcharhinus leucas*, definitely attacks humans and although mainly a marine creature, it has been seen up the Ganges as far as Patna. *Susukā* tallow was used as medicine (Vin.I,200). See **Gaha**, **Kumbhila**, **Susu** and **Timi**.

Susumāra. See **Kumbhila**.

Sūkara. Domestic Pig, also called *varāha*, Hindi *sukar*, *Sus scrofa* (Ja.I,197). Whether wild or domesticated, pigs are a stout, cloven-hoofed mammals of the order *Suidae*. The Indian pig is usually small, dark-grey and covered with bristles. Today they are rarely eaten but are kept to eat rubbish and human faeces around villages (M.III,168). They were fed dried cow dung (D.II,348).

In his last meal before he passed away the Buddha ate a dish called *sūkaramaddava*, ‘pig’s delight’, but it is not known whether this contained pork (D.II,127). Whatever it was, *sūkaramaddava* served with *badara* fruit was considered a sumptuous dish (A.III,49). The Buddha once compared the indolent person to a pig: ‘When one is lazy and gluttonous, snoozing and rolling around on the bed like a great pig, he will be reborn again and again’ (Dhp.325).

The wild pig, Hindi *jangli-sukar*, is larger, more hairy and more aggressive than its domestic cousin and males have a thick black manes. Wild pigs live in jungles and grasslands and are omnivorous. Both the domestic and the wild pig are occasionally mentioned in the Jātaka and once the Bodhisatta was reborn as a pig (Ja.III,286).

Sūkarasāli. See **Taṇḍula**.

Sūcimukha. See **Makasa**.

Sūpeyyasāka. A type of edible vegetable (Ja.IV,445).

Sekadhārī. Hindi *sekra*, *Zizyphus rugosa* (Ja.VI,536). A large shrub with long large elliptic leaves and large greenish-yellow flowers. The white fleshy fruit is palatable and is used as a medicine for ulcers in the mouth.

Setageru. A flowering tree or shrub (Ja.VI,535).

Setaccha. A type of plant (Ja.VI,535, 539).

Setaṭṭhika. A disease that attacked rice (A.IV,279). It is not clear whether this disease was caused by an insect or a fungal or viral pathogen. The commentary says it was caused by an insect boring into the stem, thereby depriving the head of sap. If this is correct, *setaṭṭhika* could well be the Rice Stalk Borer, *Chilo suppressalis*. The caterpillar of this small pale-brown moth bores into the stalk of young rice plants and feeds on the inner pith, seriously retarding the plant's growth. *Setaṭṭhika* was one of the five afflictions that could damage crops (Ja.V,401).

Setapaṇṇi. *Polygonum lanigerum*, a small many-branched herb. The stems are covered with a white wooly tomentum, the lance-shaped leaves are white beneath and also covered with tomentum and the small flowers are white. The Pāli name for this plant means 'white leaf' (Ja.VI,535).

Setapuppha. A type of tree or shrub (Ja.V,422). The name means 'white flower'.

Setavārisa. Sometimes *setavārī*, uncertain but perhaps asparagus, Hindi *satavar*, *Asparagus racemosus* (Ja.VI,535). This slender perennial has a woody prickly shoots which can be eaten and a fragrant white flower. Wild asparagus is very common in the forests of southern Bihar.

Setahaṃsa. A type of water bird (Ja.I,418; V,356). The name means 'white goose' or 'white duck'.

Sena. A type of hawk (Ja.I,273; II,51).

Sepaṇṇi. A tree, the fruit of which spotted deer would eat (Ja.I,173). The name means 'having lucky leaves'.

Semhāra. A type of animal, the sinews of which were used in making arrows, probably to bind the arrow head or flight (M.I,429).

Sereyyaka. *Barleira cristata* (Ja.III,253). A erect shrub with a bright rose-coloured or sometimes white flower borne in great profusion.

Sevāla. Submerged aquatic plants of the genus *Blyxa*, of which several species are found in northern India, most known as *sewa* in Hindi. Growing in still or gently moving water, these plants spread by runners and have long narrow leaves with rounded tips and raised veins. The delicate white flowers grow on the surface. *Sevāla* is described as growing on or over rocks (Th.1070) and floating on the surface of the water (A.III,187). Geese fed on it (Ja.III,520; IV,71) and birds could get entangled in it (Ja.II, 149-50). A sect of Brahmins from the western India who advocated various purification rituals wore garlands of *sevāla* flowers (A.V,263). The name *sevāla* must have been also used loosely for a number of aquatic plants as there is a comment of it being eaten by sea monsters (Ja.V,462). *Sevāla* is sometimes mentioned together with **paṇaka** and **saṅkha** (Vin.III,177).

Sogandhika. White Water Lily, sometimes *kallahāra*, *Nymphaea lotus* (Ja.V,37; 419; VI,518). This aquatic plant has rounded leaves that float on the surface of the water and a flower with spear-shaped pink, yellow but usually white petals and bright yellow stamens. The Tipiṭaka mentions a drink made out of *sāluka* which the commentary says is the root of water lilies and lotuses (Ja.I,563; Vin.I,246). The Bengali name for this plant when pink is *saluka*. For reasons which are not clear, one of the purgatorial realms was named after this plant (A.V,173; S.I,152). Water lilies are often mistakenly called and confused with the lotus. See **Uppala**.

Soṇa.¹ Geranium or Camel's Foot Tree, Hindi *soon*, *Bauhinia purpurea* (Ja.I,36), a medium-sized deciduous tree with large lavender-coloured flowers of great beauty and pleasant fragrance. The shape of the leaves resemble the camel's hoof and hence the tree's English name. The previous Buddhas Paduma and Nārada were both enlightened under a great geranium tree (Bv.9,22; 10,24).

Soṇa.² Domestic Dog, also called *bhobhukka* 'bow wow-maker', *katthu*, *kukkura*, *suṇa*, *supāṇa* and *suvāṇa*, *Canis familiaris*. The great diversity in dog breeds is almost entirely due to artificial and selective breeding. With a minimum of human interference dogs are muscular animals with a broad chests, relatively long legs and strong blunt claws. In ancient India dogs were sometimes kept for hunting (Ja.IV,437; V,289), but more commonly to warn of the presence of strangers and to eat household scraps. There are

occasional references to thoroughbred (*koleyyaka*) dogs (Ja.I,175; IV,437), but they were generally considered dirty, loathsome creatures and were rarely kept as pets. They were left to wander through the streets scavenging at the rubbish heaps and eating faeces and the corpses dumped in charnel grounds (A.III,324). Dogs are mentioned together with chickens, pigs and jackals as animals that eat dung (M.III,168). Unwanted babies were sometimes left out for the jackals and dogs to eat (Thi.303). Brahmins would cover the food they were eating with a leaf if a dog stood near to prevent it being rendered impure by the animal's presence (Ja.V,389). The Buddha said that one of the several unpleasant features of Madhurā, the modern Mathura, was the many fierce dogs in the streets (A.III,256).

We read that when a group of Licchavī youths roaming around in the forest with their weapons and hunting saw the Buddha, they put down their bows and called their dogs to heel (A.III,75). One of the austerities practised by some ascetics was to behave like a dog; going naked, licking their hands after eating and curling up on the ground to sleep (D.III,6, M.I,387). Some ascetics would refuse to accept alms if a dog was standing nearby or flies were swarming, probably so as not to deprive them of food (A.I,295). In one of his most severe criticisms of Brahmins, the Buddha compared them unfavourably with dogs (A.III,221). Outcastes used to eat, or were at least were said to eat, dogs (Thi.509).

The various Pāli names for the domestic dog were probably also used for the Asiatic Wild Dog, Hindi *dhol*, *Cuon alpinus*. This animal is a reddish brown forest-living canine with shorter legs and a more bushy tail than the domestic dog. Wild dogs hunt in packs and communicate with each other by a whistling sound. The Asiatic wild dog is now extinct in northern India and increasingly rare in other parts of the sub-continent. According to the Jātakas, the Bodhisatta was once reborn as a dog (Ja.I,175).

Sobhañjanaka. Drumstick Tree or Horse Radish Tree, sometimes also *siggu* or *sigru*, Hindi *sohajna*, *Moringa oleifera* (Ja.V,405; VI,535). A small tree with grey cork-like bark, small elliptic or ovate leaves, long snake-like pods and white flowers. The leaves, flowers and fruit can all be eaten, the root, which smells and tastes like horse radish, is also eaten and an oil extracted from the seeds is used in perfumes. A woman was described as being as slender as a *siggu* shoot (Ja.III,161).

Soma. The Vedas mention a plant called *soma* from which juice was extracted, mixed with ghee and flour, left to ferment and then drunk during religious ceremonies to produce an inebriating effect. The *soma* sacrifice was an integral part of Vedic religion and was still being performed at the Buddha's time, although the drink itself may no longer have been consumed (Ja.IV,365; VI,199).

There has been a great deal of discussion about the identity of the soma plant but a plausible candidate is Syrian Rue, *Peganum harmala*. This perennial woody herb has bright-green leaves about 5 cm. long and finely divided into long narrow segments, and an attractive white flower with five oblong-elliptic petals. The leathery seed capsules have three compartments, each containing about 50 dark-brown angular seeds. The seeds and roots have medicinal and hallucinogenic properties and also yield a red dye. Syrian rue is found in the western and central part of the Ganges tplain and grows best in semi-barren areas.

According to the Jātakas, in two of his former lives the Bodhisatta became so fond of pressing and drinking *soma* and of offering it to the gods that he came to be known as Sutasoma (Ja.V,177; 457).

Somarukkha. A type of tree (Ja.VI,530).

H

Haṃsa. A term for wading birds in general and for the Bar-headed Goose in particular, sometimes also *haṃsarāja*, Hindi *hans* or *raj hans*, *Anser indicus* (Ja.III,208; V,356). About the size of the domestic goose, this beautiful bird has grey, brown and white plumage with a white head and neck marked by two distinctive black bands. The bird's gentle musical 'aang aang aang' call is often praised in ancient Indian literature. The famous ornithologist Salim Ali describes it as 'one of the most unforgettable and exhilarating sounds' to be heard in nature. Vaṅṅīsa addressed the Buddha saying: 'Quickly send forth your melodious voice, oh Beautiful One. Like geese stretching out their necks, honk gently with your soft well-modulated voice' (Sn.350).

Bar-headed geese are often seen during the winter feeding in swamps and fields, and then in mid-March they fly off to nest in Tibet. To the Buddha this migratory behaviour was suggestive of detachment: 'Mindful people exert themselves. They are not attached to any home. Like geese that quit their lakes, they leave one abode after another behind' (Dhp.91); 'Geese fly the path to the sun, sages fly by their psychic powers. Having defeated Māra and his army the wise are led away from the world' (Dhp.175). Piṅgiya used the geese's arrival back in northern India in October as a metaphor for the coming of something wonderful: 'Just as a bird might leave a small wood to dwell in a forest full of fruit, so do I, having left narrow-minded teachers, come to He of Wide Vision, like a goose arriving at a great lake' (Sn.1134).

One of the most beautiful legends in the whole of the Buddhist tradition comes from the Sanskrit *Abhiṅṣkramaṇa Sūtra** and concerns a bar-headed goose. Once, while walking through the palace garden, Prince Siddhārtha saw a goose fall from the sky with an arrow lodged in its wing. He gently nestled the bird in his lap, extracted the arrow and anointed the wound with oil and honey. Soon afterwards, Devadatta sent a message to the palace saying that he had shot the bird and demanding that it be returned to him. Siddhārtha replied to the message by saying 'If the goose was dead I would return it forthwith. But as it is still alive you have no right to it.' Devadatta sent a second message arguing that it was his skill that had downed the goose and as such it belonged to him. Again Siddhārtha refused to give his cousin the bird and asked that an assembly

* *Fo Ben Xing Ji Jing* 《佛本行集经》, Taisho edition of the Chinese Tripiṭaka, T3n190,p17. The name is a re-construction of the Sūtra's original Sanskrit name.

of wise men be called to settle the dispute. This was done and after discussing the matter for some time the most senior of the wise men gave his opinion, saying 'The living belongs to he who cherishes and preserves life, not to he who tries to destroy life'. The assembly agreed with this and Prince Siddhārtha was allowed to keep the goose.

According to the Jātaka, the Bodhisatta was sometimes reborn as a bar-headed goose (Ja.III,208; IV,246, 423).

Haṭa. *Pistia stratiotes* (D.I,166). A floating stemless water plant looking something like a small cabbage and which grows in still waters. Some ascetics used to eat this plant (A.I,241). Before his enlightenment, the Buddha ate it as a part of his austerities (M.I,78).

Hatthin. Asian Elephant, *Elephas maximus*, also called *vāraṇa*, while large impressively tusked males were called *danta*, *gaja*, *kāhīti*, *kuñjara* or *nāga* (Ja.IV,494; VI,497). Females were called *uccākaṇerukā* (Ja.VI,497; M.I,178) or *kaṇerukā* (Ja.II,343) and a female with protruding tusks was called *kalārikā* (M.I,178). An elephant that had reached 60 years was called *saṭṭhihāyana* (M.I,229) and those with pink spotted foreheads, a sign of age, were called *padumin* (D.I,75; Sn.53). Calves were known as *hatthikalabha*, *kaṇeru* or *susanāga* (A.IV,435; D.II,254). There is an occasional mention of black elephants (*kālavāraṇa*) although whether this was a recognized type or just the occasional dark-coloured animal is not certain (Ja.III,113; IV,137). Several other types of elephants are mentioned, such as the *kangara*, *mātanga* and *vāmanakikā* but it is not clear what distinguished them from others (Dhp.330; Ja.V,416; M.I,178). The Pāli, Bengali and Hindi word *hatthi* means 'one with a hand' and refers to the dexterous way elephants use their trunks.

Slightly smaller than its African cousin, the Asian elephant has grey wrinkled skin, a long trunk, a two-domed head and drooping ears. They can grow up to 3 metres at the shoulders and weigh as much as 5 short tons. Asian elephants prefer thick or light jungle and eat the leaves, bark and fruit of trees, grass and aquatic vegetation. They will also raid fields and orchards. In his famous parable of the blind men and the elephant the Buddha described the elephant's ears as being like a winnowing basket, its tusks (*danta* or *hatthidanta*) like plough poles, the body like a granary, the legs like pillars, the tail is like a pestle and the tuft of the tail like a broom (Ud.68-9). The frontal lobes of the elephant's head were called 'pots' (*kumbha*). Temporin, the odorous tar-like secretion that oozes from the males during musth (Dhp.324), and the musth itself is called *mada* in Sanskrit.

The ancient Indians revered the elephant for its strength, nobility and intelligence and the creatures are mentioned in the Tipitaka more than any other animal. Elephants lived in certain forests (M.III,132),

probably because they offered better shelter, food and water than other places. Males were believed to avoid the cows and their calves so that they would not be bothered by them or have to eat the leaves and grass that they had already cropped or drink the water they had muddied (A.IV,435). It was noticed that elephants have very particular behaviour; when they charge they spread their ears and make their tails erect (Vin.II,195), they sniff the dung of other elephants (A.III,157) and they dislike heat (D.II,266). Males regularly go into must when temporin flows from their ears and they become aggressive and unruly so that their mahouts have to hold them in check (Dhp.326). At such times they may kill people or even knock down dwellings (Ja.IV,494). Elephants enjoy swimming and they amuse themselves by squirting water into their ears and over their backs (A.V,202). They pull up lotus stalks, wash them to get the mud off and then eat them (S.II,269). A bull-elephant might be seven or eight cubits high (A.V,202) and some could live for 60 years or more (M.I,229).

Elephants were tamed in India at least 1,500 years before the Buddha's time. Trackers skilled in reading the marks left by them: footprints, the scrapings of their tusks on trees, broken foliage, etc., were employed to find the animals (M.I,178). Tamed elephants would be used to capture the wild ones (M.III,132). Once caught, the trainer had to subdue the creature's forest habits, memories and behaviour, subdue its distress, fret and fever over missing the forest, and get it used to towns and people. The tamer used gentle, kind words and the elephant would gradually respond and begin eating again. Then the trainer would teach the elephant commands such as 'Take up!' 'Put down!' 'Go forward!' 'Go back!' 'Get up!' 'Sit down!' After that, it would be taught what was called 'endurance': a plank was tied to its trunk, a man would sit on its back and then it would be surrounded by other men who would poke it with poles and spears and make a great racket while the trainer would command it not to move (M.III,132-33).

To mount a trained elephant the mahout would take his hook and say: 'Give me your foot' and the elephant would bend its knee so the mahout climbs on its back (Thi.49). A trainer might demonstrate his mastery of over his elephant by getting it to stand on two legs (Ja.II,445). When tamed elephants heard the roar of the lion they would strain at and break the leather bonds that held them, defecate, panic and run around (A.II,33). Because of their value, there were veterinarians (*hatthivejja*) specializing in elephant health (Ja.I,485). Ivory was a much-prized product. Bracelets, boxes for eye-salve, caskets, ornament boxes in fantastic shapes, vases and anklets were made out of it. There is mention of a mirror handle being made out of ivory (Ja.V,302). Ivory taken from an elephant that was alive was considered superior to that taken from a dead one (Ja.I,321). There was a bazaar of ivory workers in Vārāṇasi (Ja.I,320). A type of

curved wall peg was called 'elephant tusk' (Vin.II,113) and one way of wearing the monks' under robe was to roll it up at the front rather than fold it, a style known as 'the elephant's trunk' (Vin.II,137). Pillars in buildings were sometimes made to resemble elephants feet (Vin.II,169).

Trained elephants were used for work, transportation, in warfare and to enhance royal glory. The elephant brigade was one of the four traditional branches of the army, the others being cavalry, chariots and infantry (D.I,137; Ja.IV,494). Being crushed by an elephant was a form of capital punishment (J.I,200). In battle, elephants would take great care to protect their softest and most vulnerable part, their trunk (M.I,415). A large tusked elephant was an essential possession for a monarch. King Ajātasattu rode his royal tusker from Rājagaha to meet the Buddha at Jivaka's Mango Grove (D.I,49). Once, the Buddha and Ānanda were bathing in the river at Sāvattthī when Seta, King Pasenadi's elephant, arrived to the accompaniment of music. Soon an admiring crowd had gathered to watch, commenting: 'What a beauty! What a sight! What a delight for the eye! What a body! Now that really is an elephant!' (A.III,345). An elephant fit to be a royal mount in war had to have four qualities; it had to respond well to training; in battle it had to destroy other elephants and their mahouts as well as cavalry, chariots and their drivers and footmen; it was expected to endure the injuries of spears, swords, arrows and axes and the din of drums, conchs and other noises; and it was expected to go in whichever direction the mahout directed it (A.II,117).

One of the skills taught to princes along with horsemanship, archery, swordsmanship and chariot driving, was the art of training, riding and caring for elephants (A.III,152). This was called elephant lore (A.III,327). During a food shortage the king's elephant died and people ate it (Vin.I,217-8). The rare white elephant was particularly prized (Ja.I,319) and one of the accoutrements of a Universal Monarch was a pure white elephant of sevenfold strength (D.II,174). The mount of Indra, the king of the gods, was a magnificent elephant named Erāvana (Sn.379).

Some lay people were rich enough to be able to own elephants. When Soṇa became a monk, he said he had renounced everything he owned including 'a herd of seven elephants', the implication being that he had been very wealthy (Vin.I,185).

The Buddha seems to have had a special fondness for elephants. The animal's mindful and deliberate behaviour and particularly the male's penchant for living alone in the jungle, impressed him. He said: 'On this matter the enlightened sage and the elephant with tusks as long as plough poles agree, they both love the solitude of the forest' (Ud.42). In some ways the Buddha even considered elephants to be better than humans. The elephant trainer Pessa once said to him: 'Humans are a tangle while animals are straightforward. I can drive an elephant undergoing training

and in the time it takes to make a trip to and from Campa, that elephant will display every kind of deception, duplicity, trickery and fraud. But our servants, messengers and employees, they say one thing, do another and think something else.' The Buddha agreed with this observation (M.I,340-1). He often compared himself to or was compared by others with an elephant (A.II,38). When Doṇa encountered him sitting at the foot of a tree, he appeared 'beautiful, faith-inspiring, with calm senses and a serene mind, utterly composed and controlled like a tamed, alert, perfectly trained elephant' (A.II,38). The Buddha never looked over his shoulder when he wanted to see behind him but turned around completely as does an elephant. This was called his 'elephant look' (D.II,122).

Throughout the Tipiṭaka, the Buddha advised his disciples to respond to difficulties as would an elephant: 'I shall endure abuse as a bull-elephant in battle endures the arrows shot from the bow. For indeed, ill-natured people are many'(Dhp.320); 'Formerly this mind wandered wherever it wished, where it liked and as it pleased. But today I shall completely control it as a mahout controls an elephant in must' (Dhp.326); 'Rejoice in awareness and guard your mind well. Pull yourself out of evil as does an elephant stuck in the mud' (Dhp.327); 'If you do not find a wise, zealous and virtuous companion to wander with, then like a king abandoning his conquered realm, wander alone like a bull-elephant in the forest' (Dhp.329).

Elephants are frequently mentioned in the Jātakas where they are usually depicted as noble, kindly and intelligent creatures. According to the Jātakas, the Bodhisatta was sometimes reborn as an elephant (e.g. Ja.I,319; 444; III,174; IV,90) and once as a human he worked as an elephant trainer (Ja.II,94).

Haritaka. A type of plant. The Buddha mentioned that a great caravan travelling from east to west consumed 'all the grass, wood and green *haritaka*' (D.II,342).

Harīṇa. Hog Deer, *Axis porcinus* (Ja.II,26). This small deer's short stout body gives it a pig-like appearance and hence it's English name. It has an olive-brown coat and white underside and tail. The hog deer favours tall grass and swampy areas and is now very rare in northern India.

Haripada. Uncertain, but perhaps another name for the *citraka* (Ja.III,184). The name means 'golden foot'.

Harīta. A type of creeper (Ja.VI,536).

Harītaka. The fruit of the Chebulic or Yellow Myrobalan, Hindi *haritaki*, *Terminalia chebula* (J.I,80; M.III,127). The tree from which this fruit comes is medium-sized usually with a short crooked trunk, dark-grey bark, elliptic leaves and whitish flowers. Together with *āmalaka* and *vibhītaka* the fruit is one of the ‘*triphālā*’ or three fruits, long credited in traditional Indian medicine with powerful curative properties. When ripe, the bright-yellow fruits are allowed to fall and then collected and used in tanning and as a medicine. While staying at Uruvelā the Buddha plucked a yellow myrobalan fruit (Vin.I,30). According to the *Mahāvastu*, the Buddha planted a Yellow Myrobalan tree when he was at Uruvelā. It adds the comment: ‘The myrobalans which grew from this tree are today known as the Consecrated Myrobalan Wood’ (Mvu.III,311). When the Chinese monk Yijing was in India in the 7th century, he was told of ways to use yellow myrobalan as a medicine:

‘Take equal measures of *harītaka* bark, dry ginger and granulated sugar. Pound the first two into a powder and mix it with the sugar and some water and then form the paste into pills. Take no more than ten pills in the morning and do not abstain from eating. No more than two or three doses will be sufficient to cure a patient with diarrhea. It will dissolve the gas in the stomach, dispense cold and help digestion... If no granulated sugar is available maltose or honey can be used. If one chews one piece of *harītaka* and swallows the juice every day, one will be free from disease the whole of one’s life.’

Hareṇuka. Pea, (Ja.V,405; VI,537). A very ancient species of pea and probably the one mentioned in the Tipiṭaka is the Field Pea, Hindi *matar*, *Pisum arvense*. This legume has sharply toothed bright-green leaves, pale purple or white flowers and climbs by means of tendrils. The seeds are brown or grey, marbled and easily dried. Before his enlightenment, when practising austerities, the Buddha sometimes ate pea soup (M.I,245).

Halidda. Turmeric, sometimes *haliddaka* or *haliddaka*, Hindi *haldi*, *Curcuma domestica* (A.III,230; Ja.VI,537; M.I,227; S.II,102; Vin. IV,35). A small aromatic herb with yellow flowers. The rhizomes of this plant are added to curry powder to give it a deep yellow colour and a warm spicy taste. It was also used as a medicine and artists include tumeric paint in their palates (S.III,152). As a dye though tumeric does not hold (Ja.III,525). We read of a bull being washed with turmeric water (Ja.VI,340). See **Kāra**.

Hiṅgu. Hindi *hingua*, *Ferula assafoetida*, a small thorny shrub with a yellowish-green flower (Ja.VI,536). An unpleasant smelling oil can be extracted from the drupe and it is probably this oil which the Buddha recommended as a medicine (Vin.I,201).

Hiṅgurāja. A type of bird (Ja.VI,539).

Hiṅgulajalaka. See **Kiṭa**.

Hintāla. Oriya *hital*, *Phoenix paludosa* (Ap.346; Vin.I,190). A small palm tree with large leaves. The upper part of the trunk usually covered with a fibrous network of sheaths.

Hirivera. *Pavonia odorata* (Vin.IV,34). A erect herb with pleasant smelling pink flowers which grows in dry forest areas (Ja.VI,537).

Medical Plants in the Pāli Tipiṭaka and Their Uses.

The *Bhesajja-kkhandaka* of the Vinaya Piṭaka includes a *materia medica* of which 27 are plants. In several other places in the Tipiṭaka other medical plants or their by-products are also mentioned, together with their application. Given here are the Pāli names for all these plants, the parts recommended for use, when mentioned, and each plant's medicinal uses based on S. K. Jain and Robert A. DeFillipps' *Medical Plants of India*, Algonac, 1991.

Ativisa	Root	Astringent, tonic, for fevers, cough, diarrhea and dysentery.
Āmalaka	Fruit	Bark: applied to sores, pimples, with the bark of <i>Dillenia pentagyna</i> for tubercular fistula; for cholera, dysentery, diarrhea. Leaf: For gravel, diarrhea and sores. Fruit: Refrigerant, diuretic, laxative, for indigestion, with <i>Swertia</i> and fenugreek for gonorrhoea. Raw fruit: aperient, dried and used in haemorrhagia, diarrhea, as a liver tonic, for scurvy, the juice as an eye drop. Seeds: For asthma and stomach disorders.
Uppala	Inhaling the perfume	Rhizome: Powdered and given for dyspepsia, diarrhea, piles, infusion in emollient, diuretic. Leaf: For erysipelas. Flowers: Decoction in narcotic.
Usīra	Root	Rhizome: Chewed for cough, cold, as a bitter tonic, emetic, antispasmodic, carminative, promotes flow of bronchial secretion, useful in asthma, diarrhea and dysentery, oil used as nerve stimulant, sedative and analgesic. Stem: For cough and cold. Whole plant: Sedative,

		analgesic, depressant for blood pressure, respiration, rubbed on body to relieve aches.
Kappāsika	Leaf	Root: For fever. Seed: For constipation, gonorrhoea, catarrh, gleans and chronic cystitis.
Kuṭāja	Leaf	Root: Spleen complaints, diarrhea, discharge in urine and excreta, haematuria, blood dysentery, the bites of dogs or poisonous animals. Bark: For bronchitis, cold, menorrhagia, dysentery and other stomach disorders. Flowers: For worms, leucoderma and as an appetite stimulant. Seeds: For epilepsy, post-natal complaints, leprosy and other skin diseases, constipation and indigestion, colic and dysentery.
Gothaphala	Fruit	
Candana	Not mentioned	Bark: With root bark of <i>Solanum torvum</i> and <i>Achyranthes aspera</i> for malaria. Oil: For enlarged spleen, with <i>Lepidium</i> , <i>Nerium oleander</i> , <i>Nymphaea</i> , root of <i>Michelia</i> and almonds for dysentery; in a paste and applied for headaches, skin complaints, burns and fever inflammation. Oil from heart wood: as diuretic, diaphoretic, refrigerant, expectorant and for dysuria. Oil from seeds: For skin diseases.
Tagara	Not mentioned	Root: Bitter-tasting and applied locally as an anodyne, chewed to relieve toothaches. Stem: The bark as a refrigerant. Leaf: Latex used for eye diseases.
Tālisa	Not mentioned	Bark: Given together (with the roots of other plants) to women as prenatal and post-natal treatment to purify the blood; for biliousness. Fruit: For biliousness and liver complaints.
Tila	A paste of the seed	Seeds: in a poultice externally applied for ulcers, for piles, as an emmenagogue in a decoction, for a lactagogue, emollient, diuretic and tonic. Seeds and

		oil are mixed with other medicines for use as demulcent for urinary problems and dysentery.
Tila, taṇḍula, mugga	The grains boiled together	(1) Sesame seeds and oil are mixed with other medicines for use as demulcent for urinary problems and dysentery. (2) Rice gruel is taken to relieve poor digestion, diarrhea, dysentery and similar bowel complaints. (3) External and internal uses include remedying of nervous system disorders, rheumatism, paralysis, piles, fever, coughing, and liver diseases.
Nattamāla	Leaf	Bark and leaves: as febrifuge, emmenagogue, anthelmintic. Seeds: as tonic, laxative, antipyretic, antiperiodic, for malaria and colic. Seed oil: as emollient, for rheumatism, skin diseases, in ears to stop discharge.
Narada	Not mentioned	Root: as an aromatic, bitter tonic, stimulant, antiseptic, for convulsions, inhaled (with other plants) for ulcers of nose and palate, dysentery, constipation, bronchitis (with other plants), as a laxative and to improve urination.
Nimba	Leaf	Root: as tonic, antiperiodic, strangulation of intestine. Stems: Bitter astringent, antiperiodic, cholera, vermifuge, demulcent, stimulant, cholera. As a contraceptive, 100 grams of bark from the stem is soaked in 1 liter of water and this infusion is taken by men daily for a month. Leaves: For boils, anthelmintic, on skin diseases, young leaves eaten for heart disease and tuberculosis, diarrhea, dysentery, promotes lactation. Flowers: Tonic, stomachic, stimulant. Fruit and seeds: Purgative, emollient, anthelmintic, local stimulant, insecticide, antiseptic, astringent, for leprosy, piles, heart and urinary diseases and tuberculosis.
Pakkava	Leaf	Whole plant: Juice taken to kill worms, with turmeric, pepper and ghee to

		relieve asthma. Bark: For snakebite.
Paṭolā	Leaf	Root: applied to leprous ulcers fresh or mixed with oil. Dry or powdered root taken for spleen and liver enlargement. Flowers: dried and taken as a stimulant.
Paduma	Root and stalks	Tuber: To relieve strangulation of the intestine. Rhizome: Yields nutritious arrowroot useful for diarrhea and dysentery in children. Carpel: Demulcent. Flower: as astringent and cooling agent for cholera.
Pippala	Fruit	Root: For cough, cold fever with thirst, to improve digestion, with root of <i>Michelia doltsopa</i> , ginger, long pepper and <i>Swertia</i> for puerperal fever; Fruit: as a tonic, aromatic, stomachic, carminative; in liniments for pains and paralysis, a decoction of unripe fruit for chronic bronchitis. Root and fruit: as analgesic for muscular pain, inflammation, as snuff in coma, drowsiness, as sedative for epilepsy, as cholagogue in obstructions of bile duct and gall bladder.
Bhaṅga	Leaves	Leaves boiled and steam inhaled and/or rubbed on the skin. Whole plant: Stomachic, antispasmodic, analgesic and sedative, for epilepsy, with root of <i>Bryonopsis laciniosa</i> , <i>Melothria heterophylla</i> and opium for convulsions; on sores, for cough and cold. Leaf: for dyspepsia, gonorrhoea, bowel complaints, narcotic nerve stimulant and for skin diseases.
Bhaddamutta	Root	Whole plant: For heat stroke. Root: For stomach disorders.
Marica	Fruit	Stem and leaves: For post-natal complaints. Fruit: as antiperodic in malaria fever, for protracted labour, convulsions, constipation, indigestion, post-natal complaints, bites and stings, stomachic, diaphoretic, diuretic, locally applied for sore throat, piles and skin

		diseases, with root of <i>Globba maranitina</i> or <i>Polygala arvensis</i> for cough and asthma.
Lasuṇa	Not mentioned	Bulb: For fever, pulmonary phthisis, gangrene of lung, whooping cough, rheumatism, duodenal ulcer, hyperlipidemia, certain typhoides, flatulence, atonic dyspepsia, juice on skin diseases and as an ear drop.
Vaca	Root	Root: Chewed for coughs and colds, promotes bronchial secretion, asthma, diarrhea and dysentery, the oil is used as a nerve stimulant, sedative, analgesic, epilepsy, constipation. Stem: Cough and colds. Root: Vermifuge, in intermittent fever. Whole plant: Sedative, analgesic, depressant for blood pressure, rubbed on aching body parts.
Vacattha	Root	
Vibhītaka	Fruit	Bark: As diuretic, cardiogenic, for eczema and sores in the mouth. Fruit: For dysentery, enlarged spleen, externally for measles, applied for inflammation of eyes, constipation (with ginger and other plants), coughs, bronchitis, as a gargle for inflammation of the mouth, laxative, cardiac tonic.
Vilāṅga	Fruit	Bark: used for treating cholera.
Singivera	Root	Root: For bronchitis, phthisis, with <i>Ocimum sanctum</i> for body pain; lumbago, with <i>Curcuma domestica</i> and <i>Leea hirta</i> for rheumatism; scabies, with black pepper for constipation; with black pepper and <i>Acorus</i> for indigestion; with <i>Negella</i> and <i>Carum</i> for prolapsis ani and fistula ani; with <i>Aristolochia indica</i> for cholera; with onion, garlic and red sandalwood for amenorrhoea; with unripe fruit of <i>Aegle marmelos</i> , black pepper and leaves of <i>Ocimum sanctum</i> for post-natal complaints; puerperal fever, snake, dog bites, insect stings, throat pain and to facilitate delivery.

Sulasī, i.e. Tulasi	Leaf	Root: For sudden collapse, decoction for malaria as diaphoretic. Leaf: as stimulant, antiperiodic, diaphoretic, expectorant, fever, constipation, liver disorders, with black pepper, <i>Polygala crotalarioides</i> and rice for coughs. Seeds: as a demulcent, laxative, cooling drink and for urinary complaints.
Haritaka	Fruit	Bark: As diuretic, cardiotoxic, for eczema, mouth sores. Fruit: For dysentery, enlarged spleen, externally for measles, applied to inflammation of the eyes, constipation, coughs, bronchitis, as a gargle for inflammation of the mouth, laxative, cardiac tonic. Powder of the fruit dentrifice for gums.
Haliddā	Root	Root: For hazy vision, inflammation of eyes, with tobacco for night blindness; subnormal temperature, body pains, rheumatism, with green gram for scabies, sores, with <i>Dolichos biflous</i> for infantile fistula; with mustard and <i>Solanum surattense</i> for coughs; with leaves of sweet potato, <i>Negella indica</i> and <i>Buettneria herbacea</i> root to stimulate lactation. Flowers: For sores in the throat, with <i>Shorea robusta</i> and bark of <i>Ventilago calyulata</i> for syphilis.
Hingu	Gum/resin	Bark: For colds and cough. Fruit: For pneumonia and skin diseases.

APPENDIX

English-Pali Glossary

- Aloes, *agaru*.
Angled Gourd, *kosataki*.
Ant, *pipīlikā*.
Asian Brown Flycatcher, *sagga*.
Asian Elephant, *hatthin*.
Asian Openbill Stork, *sithilahanu*.
Asian Paradise Flycatcher, *celakedu*.
Asian Pied Starling, see *pakkhin*.
Asiatic Lion, *sīha*.
Asiatic Wild Dog, see *soṇa*.
Asparagas, see *setavārisa*.
Basil, *tulasi*.
Balloon Vine, see *sibala*.
Bamboo, *veḷu*.
Banana, *kadali*.
Banyan Tree, *nigrodha*.
Barasingha, *rohicca*.
Bark, *vakkala*.
Bar-headed Goose, *haṃsa*.
Barking Deer, *kakkaṭa*.
Barley, *yava*.
Basil, *tulasi*.
Bat, *vagguli*.
Baya Weaver, see *paṭikutta*.
Bed Bug, *maṅkuna*.
Bee, *madhukara*.
Bengal Cotton, *samuddakakappāsī*.
Bengal Quince, *beluva*.
Betel Palm, *pūga*.
Betel Vine, *tambūla*.
Bird, *pakkhin*.
Bitter Apple, *indavāruṇī*.
Bitter Gourd, *tittakalābu*.
Blackbuck, *miga*.
Black Cumin, *jīraka*.
Black Gram, *māsa*.
Black Ibis, see *bhassara*.
Black-lip Oyster, *mutta*.
Black Plum Tree, *jambu*.
Blue Bottle, *nīlamakkhikā*.
Blue Water Lily, *uppala*.
Boal Fish, see *mahāmukhamaccha*.
Bodhi Tree, *assattha*.
Booted Eagle, see *byaggha*.
Bottle Gourd, *lābu*.
Brahminy Shelduck, *cakkavāka*.
Bread Fruit Tree, *labuja*.
Brown Fish Owl, *ulūka*.

Buffstriped Keelback, see *deḍḍubha*.
 Buffalo, *mahisa*.
 Bull Shark, see *susukā*.
 Bulletwood Tree, *vakula*.
 Camel, *oṭṭha*.
 Camel's Foot Creeper, *māluvā*.
 Camphor, *kappūra*.
 Cane, *vetta*.
 Cannabis, *bhaṅga*.
 Caracal, see *biḷārā sasakaṇṇikā*.
 Castor Oil Tree, *eraṇḍa*.
 Cat, *biḷāla*.
 Catfish, *puṭhuloma*.
 Centipede, *satapadī*.
 Ceylon Oak, *kāsumārī*.
 Champā, *campaka*.
 Checkered Keelback, *udakasappa*.
 Chestnut-bellied Sand Grouse, *tittira*.
 Chirauli Nut Tree, *rājāyatana*.
 Chitra Turtle, see *cittacūlā kacchapa*.
 Cicada, see *cīrilikā*.
 Cluster Fig, *udumbara*.
 Cobra, *nāga*.
 Coconut Palm, *nālikera*.
 Coral, *pavala*.
 Common Hoopoe, *kukutthaka*.
 Common Garden Lizard, *kakaṇṭaka*.
 Common Hill Myna, *sāliya*.
 Common Indian Monitor, *godha*.
 Common Wolf Snake, *agārasappa*.
 Conch, *saṅkha*.
 Copper Head, see *sappa*.
 Cotton Bush, *kappāsa*.
 Cowrie, see *sippi*.
 Crab, *kulīr*.
 Crane, *kaṅka*.
 Creepers, *latā*.
 Cricket, *cīrilikā*.
 Crimson Sunbird, see *lohapitṭhā*.
 Crocodile, *kumbhīla*.
 Crow, *kāka*.
 Cuckoo, *karavīka*, *kālakokila*.
 Cucumber, *kakkārāka*.
 Curry Leaf Tree, *kāra*.
 Date Palm, *khajjūra*.
 Deer, *hariṇa*, *kuruṅga*, *laṅghi*, *miga*,
sarabha, *sārāmiga*.
 Dog, *soṇa*.
 Domestic Cattle, *go*.
 Domestic Fowl, *kukkuṭa*.
 Donkey, *gadrabha*.
 Dove, *kakuṭa*, *pārāvata*, *pakkhima*.
 Drongo, *bhiṅkāra*.
 Drumstick Tree, *sodhañjanaka*.
 Dwarf Bamboo, *khuddakaveḷu*.
 Ear Mange, see *vittacchikā*.
 Earthworm, *gaṇḍuppāda*.
 Egg Plant, *vātiṅgaṇa*.
 Eel, *amarā*.
 Egret, *baka*.
 English Broomcorn, *cīnaka*.
 Eurasian Golden Oriole,
ambakamaddarī.
 Eurasian Sparrow Hawk, *bhāsa*.
 Fever Nut, *nattamāla*.
 Field Pea, *hareṇuka*.
 Filariasis, see *makasa*.
 Firefly, *khajjopanaka*.
 Fish, *maccha*.
 Fishing Cat, see *biḷāla*.

- Flame of the Forest, *kiṃsuka*.
 Flax, see *khoma*.
 Flea, *uppātaka*.
 Flowers, *puppha*.
 Flycatcher, *sagga*.
 Flying Squirrel, *pakkhabilāla*.
 Four-horned Antelope, *kurunṅa*.
 Fox, *jambuka*.
 Fresh Water Mussel, see *sippī*.
 Frog, *maṇḍūka*.
 Ganges Dolphin, *susu*.
 Ganges Shark, see *susukā*.
 Garlic, *lasuṇa*.
 Gaur, *gavara*.
 Geranium Tree, *soṇa*.
 Gharial, *gaha*.
 Ginger, *siṅgivera*.
 Glossy Ibis, see *bhassara*.
 Goard, *alābu*, *kakkāru*, *paṭola*.
 Goat, *aja*.
 Golden Barb, see *maccha*.
 Goose, *haṃsa*, *kādamba*, *rājahaṃsa*.
 Grains, *dhañña*.
 Grape Vine, *muddika*.
 Grass, *tiṇa*.
 Grasshopper, *paṭaṅga* and *salabha*.
 Great Bamboo, *mahāveḷa*.
 Great Cormorant, *udakakāka*.
 Great Crested Grebe, see *balākā*.
 Greater Adjutant Stork, see *kaṅka*.
 Greater Flamingo, see *rājahaṃsa*.
 Green Gram, *mugga*.
 Grey Francolin, *kapiñjala*.
 Grey Heron, *kāraṇḍava*.
 Gulancha Vine, *pūtilatā*.
 Gums, see *jatu*.
 Hanuman Langur, *vānara*.
 Head Lice, *ūkā*.
 Hare, *sasa*.
 Hellebore, *kaṭukarohiṇī*.
 Heron, *kaṅka*, *karaṇḍava*, *koṅca*, *koṅcavadaka*.
 Himalayan Wild Cherry, *padmaka*.
 Hive Bee, see *madhukara*.
 Hoary Basil, *ajjaka*.
 Hog Deer, *hariṇa*.
 Hog Plum, *ambāṭaka*.
 Honey Tree, *madhuka*.
 Hophead, see *tikaṅṭaki*.
 Horse, *assa*.
 Horse Gram, *kalāya* also *kulaṭṭha*.
 Horse Radish, *mūlakakanda*.
 Horse Radish Tree, *sodhañjana*.
 House Fly, *makkhikā*.
 House Swift, see *bhaṅḍu*.
 Ibis, see *bhassara*.
 Indian Beech, *karañja*.
 Indian Bull Frog, *uddhumāyikā*.
 Indian Cassia, *tamāla*.
 Indian Chameleon, *sarabhū*.
 Indian Cobra, see *nāga*.
 Indian Coral Tree, *mandārava*.
 Indian Dill, *satapuppha*.
 Indian Elm, *kaṅcaka*.
 Indian Flying Fox, *tuliya*.
 Indian Frankincense, *sallakī*.
 Indian Gooseburry, *āmalaka*.
 Indian Liquorice, *jiñjuka*.
 Indian Long Pepper, *pippalī*.
 Indian Mustard, *sāsapa*.

- Indian Narrow-headed Softshell Turtle, see *Cittacūlā Kacchapa*.
 Indian Oleander, *kaṇavīra*.
 Indian Persimmon, *tiṇḍuka*.
 Indian Plantive Cuckoo, see *karavīka*.
 Indian Plum, *tāḷisa*.
 Indian Pond Frog, *nīlamaṇḍūka*.
 Indian Pond Heron, *koñca*.
 Indian Python, *ajakara*.
 Indian Roller, *kikī*.
 Indian Teak, *sāka*.
 Indigo, *nīlī*.
 Insects, *kīṭa*, *siriṃsapa*.
 Iron Wood Tree, *nāga*.
 Jack Tree, *panasa*.
 Jackal, *sigāla*.
 Jasmine, see *sumanā*, *vassikā*, *yūthikā*.
 Jew's Mellow, *koṭṭha*.
 Jujube Fruit, *badara*.
 Jungle Cat, see *biḷāla*.
 Jute, see *poṭṭhaka*.
 King Cobra, *kaṇhasappa*.
 Kingfisher, *kulīraka*.
 Kite, *ajjhapatta*.
 Koel, *kokila*.
 Kodo Millet, *kudrūsa*.
 Kokum Butter Tree, *koka*.
 Lac, *lākhā*.
 Lagga, see *kurara*.
 Lapwing, see *dindibha*.
 Large Green-billed Malkaha, *aṅgahetuka*.
 Lesser Indian Reed Mace, *eraka*.
 Linseed, see *khoma*.
 Leopard, *dīpi*.
 Leopard Cat, see *biḷāla*.
 Leprosy, *kuṭṭha*.
 Lesser Indian Reed-mace, *biḷālī*.
 Linen, *khoma*.
 Lion, *kālasīha*, *kesara*, *sīha*.
 Licorice, *jiñjūka*, *madhulaṭṭhikā*.
 Little Bee, see *khudda*.
 Little Cormorant, *udakakāka*.
 Long-leaved Pine, *saraḷa*.
 Lotus, *paduma*.
 Lyon Bean, *kummāsa*.
 Madder, *mañjeṭṭhī*.
 Maggot, *kimi*, *pulava*.
 Mango, *amba*.
 Marking Nut Tree, *bhallāṭaka*.
 Milk Tree, *khīrapaṇṇi*.
 Millet, *kaṅgu*.
 Mongoose, *nakula*.
 Monkey, *kapi*, *makkāṭa*, *vānara*.
 Monkshood, *ativasa*.
 Mosquito, *makasa*.
 Moth, see *paṭaṅga* and *salabha*.
 Mother-of-pearl, *saṅkhamutta*.
 Mouse, *mūsika*.
 Mud Eel, see *amarā*.
 Mule, *assaka*.
 Muniya, *hiṅgulajalaka*.
 Mushroom, *ahihattaka*.
 Mussel Shell Creeper, *girikaṇṇika*.
 Mustard, *rājikā*.
 Myna, *sāliya*.
 Myrobalan, *āmalaka*, *harītaka*, *vibhītaka*.
 Neem Tree, *nimba*.
 Nilgai, *gokaṇṇa*.

Northern House Gecko, *gharagolikā*. Resins, see *jatu*.
 Nut Grass, *bhaddamuttaka*. Rhesus Macaque, *kapi*, *makkāṭa*.
 Oleander, *karavīra*. Rhinoceros, *khagga*.
 Onion, *paṇḍuka*. Rice Plant, *taṇḍula*.
 Otter, *udda*. Rice Stalk Borer, see *setaṭṭika*.
 Owl, *kosika*. Rock Bee, *bhamara*.
 Pabda Catfish, *pāvusa*. Rose-ringed Parakeet, see *suka*.
 Pagusa Catfish, *pāgusa*. Rosha Grass, *phanijjaka*.
 Painted Gourd, *paṭola*. Roundworm, see *makasa*.
 Palmyra Palm Tree, *tāla*. Rushes, *naḷa*.
 Panic Seed, *piyaṅgu*. Safflower, *kusumbhara*.
 Parrot, *suka*, *cirīti*. Sal Tree, *sāla*.
 Pied Crested Cuckoo, *kālakokila*. Samba, *sarabha*, *sāmāmiga*.
 Pig, *sūkara*. Sandalwood Tree, *candana*.
 Pigeon, *kapota*, *pārāvata*. Saw Fish, see *makara*.
 Peafowl, *mayūra*. Scabies, *vitacchikā*.
 Pepper, *marica*, *pippalī*. Scarab Beetle, *gūthapāṇa*.
 Pheasant-tailed Jacana, *jīvaṃjīvaka*. Scholars Tree, *sattapaṇṇa*.
 Pomegranate, *dālikā*. Scorpion, *vicchika*.
 Porcupine, *sallaka*. Screw Pine, *ketaka*.
 Porcupine Flower, *koraṇḍaka*. Seeds, *bīja*.
 Quail, *lāpasakuṇa*. Sesame, *tila*.
 Rat, *undura*. Shahin Falcon, see *vyagghīnasa*.
 Raven, *kakola*. Sheep, *eḷaka*.
 Red Coral, *pavāla*. Silk Worm, *kosakāraka*.
 Red Jungle Fowl, *kukkūṭa*. Sloth Bear, *accha*.
 Red Rice, *nīvāra*. Small White Indian Water Lily, see
 Red Rot, *mañjiṭṭhikā*. *uppala*.
 Red Sandalwood, see *candana*. Snake, *sappa*.
 Red Silk-cotton Tree, *simbali*. Soap Nut Tree, *ariṭṭhaka*.
 Red Sun Fish, *rohita*. Spider, *makkāṭaka*.
 Red Velvet Mite, *indagopaka*. Sparrow, *kuliṅka*.
 Red-wattled Lapwing, see *dindibha*. Spikenard, *narada*.
 Red Weaver Ant, *tambakipillika*. Spinach, *phalaka*.
 Reeds and Rushes, *naḷa*. Spoonbill, see *āṭa*.

Spot-billed Duck, see
 pañcavaṇṇahaṃsa.
 Spotted Deer, *citraka*.
 Spotted Dove, *pakkhima*.
 Squirrel, *bilapakkha*, *kalandaka*.
 Stork, see *daṇḍamāṇavaka*.
 Stripped Hyena, *taraccha*.
 Stripped Snakehead, *sakula*.
 Sugar Cane, *ucchu*.
 Sun Hemp, *sāṇa*.
 Syrian Rue, see *soma*.
 Swallow Wort, *akka*.
 Swamp Deer, *rohicca*, *ruru*.
 Sweet Flag, *vaca*.
 Swift, see *bhaṇḍu*.
 Tamarind, *ciñcā*.
 Termite, *upacikā*.
 Thorn Apple, *dhanutakkāri*.
 Tiger, *vyaggha*.
 Toadstool, *ahihattaka*.
 Tortoise, *kacchapa*.
 Towel Gourd, see *goṭṭhaphala*.
 Trees, *rukkha*.
 Trumplt Flower, *pāṭali*.
 Turmeric, *halidda*.
 Turtle, *kacchapa*.
 Variegated Bauhinia, *kovilāra*.
 Vines, *latā*.
 Vine Snake, see *silābhu*.
 Vulture, *gijjha*, *lohapiṭṭhā*, *sakunta*.
 Water Chestnut, *siṅghāṭaka*.
 White Gourd Melon, *kakkṇru*.
 Wave Leaf Fig, *piḷaṅkha*.
 Whale, see *susuka*, *timi*.
 Wheat, *godhūma*.
 White Mustard, *siddhattaka*.
 Wild Barley, see *yava*.
 Wild Boar, *varāha*.
 Wild Buffalo, see *mahisa*.
 Wild Date, see *khajjūra*.
 White Gourd Melon, *kakkāru*.
 White Water Lily, *sogandhika*.
 Wild Orange, *mātuluṅga*.
 Wild Rice, *nīvāra*.
 Wolf, *koka*.
 Wood Apple Tree, *kapittha*.
 Wood Borer, *guṇa*.
 Woodpecker, *koṭṭha*,
 rukkhakoṭṭasakuṇa, *sattapatta*.
 Wool, *uṇṇa*.
 Worms, *kimi*.
 Yak, *camara*.
 Yeast, *kiṇṇa*.
 Yellow Jade Orchard Tree,
 champaka.
 Yellow-legged Green Pigeon, see
 mayahaka.
 Yellow-throated Sparrow, see *cirīṭa*.

ABBREVIATIONS

Journals

ABORI	<i>Annals of the Bandarkar Oriental Research Institute</i>
AAH	<i>Asian Agri-History</i>
BNISI	<i>Bulletin of the National Institute of Science of India</i>
JAOS	<i>Journal of the American Oriental Society</i>
JAS	<i>Journal of the Asiatic Society</i>
JPTS	<i>Journal of the Pali Texts Society</i>
JRAS	<i>Journal of the Royal Asiatic Society</i>
JRASB	<i>Journal of the Royal Asiatic Society of Bengal</i>
HSPCIC	<i>History of Science, Philosophy and Culture in Indian Civilization</i>
IJHS	<i>Indian Journal of Historical Studies</i>
SHR	<i>Samenwerkende Huisatsendiensten Rijnland</i>
UCPCP	<i>University of California Publications in Classical Philology</i>

Pali and Sanskrit Texts

A	<i>Aṅguttara Nikāya</i> , ed. R. Morris, E. Hardy, PTS London 1885-1900
Ap	<i>Apadāna</i> , ed. Mary E. Littey, PTS Oxford 2000
Bv	<i>Buddhavaṃsa</i> , ed. N. A. Jayawickrama, PTS London 1974
Cp	<i>Cariyāpiṭaka</i> , ed. N. A. Jayawickrama, PTS London 1974
D	<i>Dīgha Nikāya</i> , ed. T. W. Rhys Davids, J. E. Carpenter, PTS London 1890-1911

Dhp	<i>Dhammapada</i> , ed. O. Von Hinüber, K. R. Norman, PTS Oxford 1994
Dhp-a	<i>Dhammapada Aṭṭhakathā</i> , ed. H. C. Norman, PTS London 1906-14
Dhs	<i>Dhammasaṅgaṇi</i> , ed. E. Müller, PTS London 1885
It	<i>Itivuttaka</i> , ed. E. Windisch, PTS London 1889
Ja	<i>Ĵātaka</i> with commentary, ed. V. Fausebøll, London PTS 1877-96
Kv	<i>Kathāvattu</i> , ed. A. C. Taylor, PTS London 1894
M	<i>Majjhima Nikāya</i> , ed. V. Trenckner, R. Chalmers, PTS London 1887-1902
Mil	<i>Milindapaṇho</i> , ed. V. Trenckner, PTS London 1880
Mv	<i>Mahāvastu</i> , ed. E. Senart, Paris 1882-97
Pj	<i>Paramatthajotikā I</i> , ed. H. Smith, PTS London 1915
Pv	<i>Petavatthu</i> , ed. N. A. Jayawickrama, PTS Oxford 1977
S	<i>Samyutta Nikāya</i> , ed. L. Feer, PTS London 1884-98
Sn	<i>Sutta Nipāta</i> , ed. D. Andersen, H. Smith, PTS London 1913
Th, Thi	<i>Theragāthā</i> and <i>Therīgāthā</i> , ed. H. Oldenberg, R. Pischel, 2 nd edition, PTS London 1966
Ud	<i>Udāna</i> , ed. P. Steinthal, PTS London 1885
Vin	<i>Vinaya Piṭaka</i> , ed. H. Oldenberg, PTS London 1879-83
Vism	<i>Visudhimagga</i> , ed. C. A. F. Rhys Davids, PTS London 1920-21
Vv	<i>Vimānavattu</i> with commentary, ed. N. A. Jayawickrama, PTS Oxford 1977

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