

The Kalakad–Mundanthurai Tiger Reserve: A global heritage of biological diversity

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Kalakad–Mundanthurai Tiger Reserve (KMTR), once largely a reserve forest, became a Tiger Reserve in 1988. This Reserve at the southern end of the Western Ghats, a global biodiversity hotspot, is a veritable home of ecological and biological diversity. It has about 150 localized plant endemics, and 33 fish, 37 amphibian, 81 reptile, 273 bird and 77 mammal species. KMTR also protects the catchment of numerous rivers, which supports the agricultural economy of three adjacent districts. This fascinating Reserve, and the unparalleled encouragement from the Tamil Nadu Forest Department, has over the decades attracted numerous biologists, who have studied in detail various species of the Reserve. The Reserve has enormous potential for future research and conservation of biodiversity and endangered species such as the tiger. Tiger conservation in the southern Western Ghats should have landscape-level planning and the suggested Megamalai–Kalakad Tiger Conservation Unit offers an ideal framework to turn this suggestion into a reality. KMTR is an excellent illustration of how research and management need to go hand in hand to achieve conservation objectives.

KALAKAD–MUNDANTHURAI Tiger Reserve (KMTR), a valuable repository of biodiversity, is in the southern end of the Western Ghats, in the Ashambu hills of Agasthyarmalai region. Because of the occurrence of numerous streams and rivers, the Reserve is called a 'River Sanctuary' (Figure 1). The Reserve is the southernmost home to some of the charismatic and endangered mammals such as the Nilgiri tahr and the tiger (scientific names of species found in KMTR are given in the Appendix 1). It is one of the few places in South India where five primate species occur – lion-tailed macaque, Nilgiri langur, common langur, bonnet macaque and slender loris.

The establishment of this Tiger Reserve has a history of four decades. Kalakad Wildlife Sanctuary (253 km², Thirukkurugudi and Kalakad ranges) was established in 1977 primarily to give protection to the endangered lion-tailed macaque. This was in response to a plea made to the Tamil Nadu government by J. C. Daniel, Director, Bombay Natural History Society, after his visit to Kalakad in

May 1971. Mundanthurai Wildlife Sanctuary (567 km², Ambasamudram and Mundanthurai ranges and Singampatti Zamin) was declared a Tiger Sanctuary in 1962 and designated as a Wildlife Sanctuary in 1977. After my surveys in these hills in 1983–1984 as the Elephant Project Scientist of BNHS, I visualized a conservation plan for Kalakad–Mundanthurai and suggested that this area should be adopted by Project Tiger¹, which became a



A herd of Nilgiri tahr: Conservation of this endangered mountain goat in KMTR requires research inputs, planned management, and monitoring. (Photo: A. J. T. Johnsingh)



KMTR is an important area for research on and conservation of the nocturnal slender loris. (Photo: A. J. T. Johnsingh)

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reality² in April 1988. Now with the inclusion of Upper Kodayar and Boothapandi Reserve Forests of Kanyakumari district, the Tiger Reserve is about 900 km².

KMTR, sprawling across a diverse terrain, is ecologically rich. It has vegetation types ranging from thorn scrub to montane (wet) evergreen forests, all within an altitudinal range from sea level to 1866 m above sea level. The exemplary ecological richness and the unparalleled encouragement from the Tamil Nadu Forest Department, have over the decades attracted numerous biologists both from abroad and within India. Their findings have enhanced our understanding and appreciation of the biological values of this area.

Biodiversity hotspot

The Western Ghats, one of the 25 mega biodiversity hotspots of the world³, covers 5% of India's land area, yet contains more than 4000 or 27% of the country's total plant species. Of these, 1500 species are endemic⁴. Nearly 63% of India's arborescent evergreen taxa are endemic to the Western Ghats⁵. In the Agasthyarmalai region, the pattern of high endemism and diversity is well illustrated by plant taxa. This region has about 150 localized plant endemics and a rich reservoir for a large number of wild relatives of cultivated plants such as cardamom, mango, banana, rice, jackfruit and turmeric⁶.

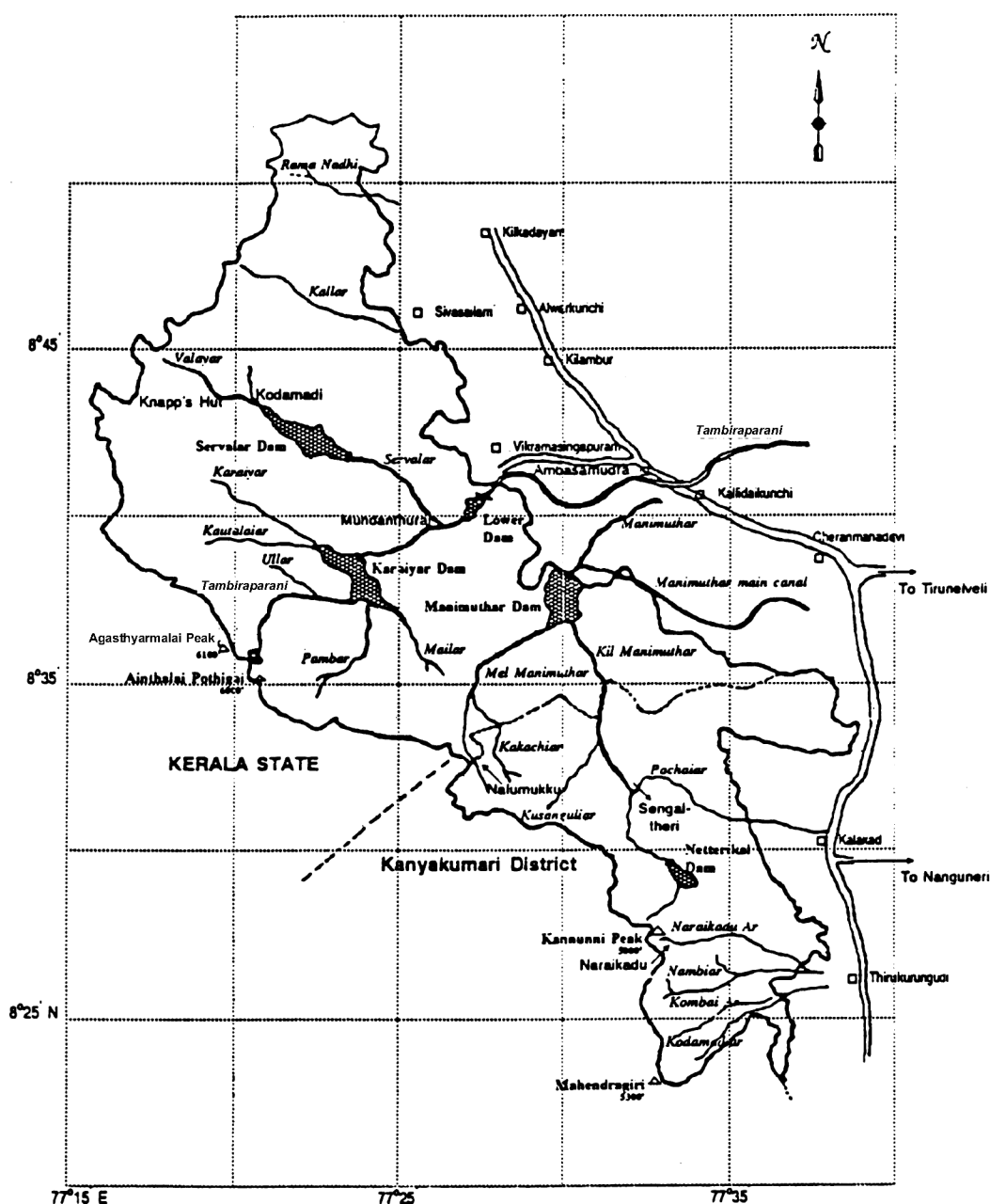


Figure 1. Map of Kalakad-Mundanthurai Tiger Reserve.

Orchids like *Brachycorhynchus splendida* and *Disperis neilgherrensis* show the affinity of this Reserve to Africa. Recently a new edible fruit species (*Sauropus* sp. nov.) has been recorded from these hills (Sathish Kumar, pers. commun.). Tree species such as *Bischofia javanica*, *Canarium strictum* and *Mesua ferrea* indicate the floral affinity of KMTR with north-east India⁷. Occurrence of tree species such as *Oberonia forcipata*, *Memecylon angustifolium*, *Mesua ferrea*, *Elaeocarpus serratus* and *Calamus thwaitesii* in Agasthyarmalai and Sri Lanka explains the past geological linkage between south India and Sri Lanka⁸. Diversity of tree species in Kakachi, an undisturbed mid-elevation evergreen forest in KMTR, appears to be greater than at other sites in the Western Ghats such as Anamalai and Nelliampathy⁹.

Yet we were callous about this area of great biological significance. Consequently, between 1960 and 1990 this area lost 85.6 km² to plantations, 42.0 km² to encroachments and 36.4 km² to reservoirs⁵. In spite of these ravages, the region still protects the catchment of numerous rivers, which support the agricultural economy of Tirunelveli, Tuticorin and Kanyakumari districts².

Early research

The first published observations on the mammals of this area come from Webb-Peploe, a Christian missionary working with Dohnavur Fellowship¹⁰. He recorded the occurrence of rusty-spotted cat in the scrub forests on the way to Naraikadu. He also reports of the occurrence of brown palm civet, striped hyena (*Hyaena hyaena*) and the possible occurrence of Malabar civet (*Viverra zibetha*). Barking deer (*Muntiacus muntjak*) was not recorded.

Primatologists from abroad as well as from India have been attracted to KMTR by the occurrence of five primate species, all of which could be seen in a day's trek. Green

and Minkowski¹¹ worked out the annual home range of a 15-member lion-tailed macaque group to be around 5 km² in Kakachi. They estimated that a large contiguous block of at least 160 km² of rainforest rich in *Cullenia excelsa* and *Artocarpus hirsuta* is needed to maintain a viable breeding population of about 500 animals. Ramesh *et al.*⁵ report that there is c. 440 km² of contiguous mid-elevation rainforest in KMTR and adjacent hills. Such contiguous rainforest is rare in Western Ghats today.

Soon after the lion-tailed macaque study, John Oates studied Nilgiri langur in Kakachi. The study resulted in a paper on the leaf chemistry of langur food plants¹². The langur study was followed by research on bonnet macaque on the Mundanthurai Plateau and in evergreen forests near Sengaltheri¹³. On the Plateau, 68 plant species were recorded as food plants. Fruits, particularly figs, and insects constituted the bulk of the diet.

Recent research

One of the ideal places in KMTR for wildlife research is the Mundanthurai Plateau which has an area of about 50 km² and is at an altitude of 180 m above sea level. It has facilities to stay, two perennial rivers and varied habitats such as riverine forests, plantations, dry deciduous forests and Deer Valley where *kumri* cultivation was once practised.

The early 1980s saw a spate of research by the wildlife biology students of A.V.C. College, Myladuthurai for their M Sc dissertation under the guidance of the author. Most of the research was done on the Plateau and led to several useful publications. The first paper¹⁴ recommended that to improve forage availability for ungulates, fire should be used sparingly, and where fire-intolerant plant species are to be protected, fire should be banned. Much later in the same grassland (Deer Valley), Sankaran



A wild Asian elephant tusker in KMTR. (Photo: A. J. T. Johnsingh)



A patch of tropical evergreen forest in KMTR — much of the endemic biodiversity is found in the evergreen forests. (Photo: A. J. T. Johnsingh)

and McNaughton¹⁵ demonstrated and explained how low-diversity plant communities can show greater compositional stability when subjected to experimental perturbations characteristic of their native environments. Johnsingh and Joshua¹⁶ highlighted the biological values of the threatened gallery forest of river Tambiraparani; *Dasia halianus*, an arboreal skink, reported earlier only from Sri Lanka, was discovered by them in this gallery forest.

Later, Johnsingh and Joshua¹⁷ analysed the patterns of bird species diversity within the riverine, dry deciduous and secondary vegetation. They found that seasonal variation in bird abundance was more pronounced in the riverine and dry deciduous forest than in the secondary vegetation which was avoided by most of the winter migrants. The paper emphasized the need for assessing and monitoring the conservation status of avifauna in managed forests in India.

The study also enabled Joshua and Johnsingh¹⁸ to compile a bird list of 159 species for the Plateau. Sunderraj¹⁹ continued his M.Sc. dissertation work for his Ph D, quantifying the group size, composition, ranging and food plants of Nilgiri langur in the gallery forests of Tambiraparani and Servalar on the Plateau. The study quantified the biotic disturbances of pilgrimage to Sorimuthayanar Koil and came up with valid recommendations (Sunderraj and Johnsingh, this issue). Sunderraj and Johnsingh²⁰ also quantified the impact of the flash flood along the Servalar river in October 1992, which decimated the gallery forest and its arboreal mammals (Nilgiri langur, bonnet macaque and Indian giant squirrel). The conclusion was that revival of the gallery forest was necessary and it could be aided by planting of *Alphonsea sclerocarpa*, *Syzygium cumini*, *Mangifera indica*, *Derris indica*, *Albizzia amara* and *A. lebbeck*.

Johnsingh and Sankar²¹ identified 162 food plants of chital, 139 of sambar and 90 of cattle on the Plateau. They concluded that elimination of cattle from the Plateau and creation of more meadows would lead to an increase in chital population that was then estimated to be 150–200 animals. Sankar²² did cafeteria experiments with a tame chital, which added 25 species to the list of chital food plants identified by him. Johnsingh and Vickram²³ came up with a useful photo-documented paper on fishes of Mundanthurai Wildlife Sanctuary describing 33 species. They came up with five recommendations that could significantly improve the fish resources of the sanctuary.

Ravi Chellam²⁴ did a four-month study on common langur and was successful in taking a unique photograph of male Nilgiri langur copulating with a female common langur²⁵. The foothills were surveyed and it was discovered that the langur occurred in three distinct isolated sub-populations: on the Plateau, in the Madura Coats factory campus at the foothills just outside the forest boundary, and the Nambikovil river in Thirukkurungudi range²⁶. This discontinuous distribution suggests the past continuous

distribution along the forest boundary. It appears that common langurs occasionally wander off from their ranges as one was seen in Naraikadu in Thirukkurungudi range²⁷, and two in Thalayanai in Kalakad range (D. Mudappa, pers. commun.). It may be worth helping the common langur to recolonize all the riverine tracts along the foothills through reintroduction, which will significantly improve the prey base for the leopard.

Sathyakumar²⁸ analysed leopard scats collected from the Plateau and found that sambar, blacknaped hare, chital, mouse deer and cattle contributed to the diet. There was no mention of barking deer in the diet. However, Ramakrishnan *et al.*²⁹ found barking deer remains in nearly 8% of 111 leopard scats and recorded no mouse deer remains. These findings are questionable. Katti^{30,32} and Katti and Price³³ studied the leaf warblers of the genus *Phylloscopus*. In his delightful article, Katti highlights the ecological role of warblers and emphasizes that a study of warblers is as important as that of large mammals³².

Some recent research in KMTR has focused more on the smaller little-known animals such as amphibians and reptiles. India has 215 amphibian species. The Western Ghats have 120, of which 90 are restricted to rainforests. Thirty-two species have been recorded from the rainforests of KMTR of which 25 are endemic to Western Ghats (Vasudevan *et al.*, this issue). *Melanobatrachus indicus*, the black narrow-mouthed frog was rediscovered after 100 years in Kakachi³⁴.

The total number of reptilian species in India is 480, of which the Western Ghats have 197, so far, around 55 species have been reported from the rainforests of KMTR. N. M. Ishwar (pers. commun.) reports that the number of reptilian species from KMTR is around 81, which is quite high for any single protected area. Some species of biological and ecological importance are *Calotes andamanensis*³⁵, *Geoemyda silvatica* (Cochin forest cane-



The recently rediscovered rainforest lizard *Calotes andamanensis* is known only from KMTR. (Photo: S. U. Saravanakumar)



The Oriental Bay Owl (*Phodilus badius*) in Sengaltheri. (Photo: T. R. Shankar Raman)

turtle), *Hemidactylus anamallensis* (Anaimalai gecko), and *Otocryptis beddomii* (Indian kangaroo lizard).

Katti *et al.* (unpubl.) have compiled a list of 273 species of birds found in and around KMTR (Appendix 1). Of the 16 species of birds endemic to the Western Ghats, 14 are found in KMTR. The Oriental Bay Owl, a very rare species, has been recorded from Sengaltheri. There may be a good population of Broad-tailed Grassbird near Kodayar. The White-bellied Shortwing, another rare Western Ghats endemic, is found in high elevation rainforests like Neterikal. The mammal list assembled by D. Mudappa and J. Ronald (pers. commun.) contains at least 77 species. Special mention must be made of the rodent the Malabar spiny dormouse, the only species of this genus, which seems to have a wide distribution in KMTR (Mudappa *et al.*, this issue). Appendix 1 gives the list of vertebrates identified in the Reserve. Species and subspecies that are endemic to Western Ghats are marked with an asterisk.

Opportunities for research and conservation

KMTR is an invaluable amphitheatre for future research. Biological research here is of great management and conservation significance. Archival research could be done to know the history of KMTR and the land use changes the area has undergone over the decades. It will be vital to inventory and quantify the distribution and abundance of endangered and endemic species and assess the factors that govern their abundance. KMTR will be an excellent place to do a radio-telemetry study on mouse deer, a species on which very little information is available in India. The rainforest tract in KMTR, supposed to be the most extensive in the Western Ghats, offers an unparalleled opportunity to investigate and monitor various parameters related to rainforest ecology. Only if studies in rainforest

ecology are on a long-term basis, can information valuable for rainforest conservation be collected.

KMTR offers excellent opportunities for practicing restoration ecology. There are 28 enclaves within KMTR³⁶, many of which may be acquired by the Forest Department in course of time. As and when these enclaves are acquired to add them to the wildlife habitat, native vegetation should be grown in them. Research related to restoration ecology such as identification of suitable plant species, raising and transplantation of their saplings should be actively encouraged. The knowledge acquired through such programmes will come in handy, for example, when the lease of enclave Bombay Burmah Trading Corporation, which has a total area of about 34 km², expires in 2028 and if the Government decides to integrate the enclave into KMTR. Increase in pilgrimage and tourism and its impact on wildlife needs to be quantified and Sunderraj and Johnsingh (this issue) have already set a model for such studies.

In addition, research and management efforts need to be directed towards endangered species such as the Nilgiri tahr and tiger. In extreme southern Western Ghats, which includes the southern portions of KMTR and the adjoining Neyyar Wildlife Sanctuary, we have an excellent opportunity to bring back a population of about 1000 tahr. The tahr habitat here is extensive from the southern slopes of Agasthyarmalai in the west to Thiruvannamalai hills in the south east and Kottangathatti and Kannunni in the north. Several decades ago, tahr occurred throughout these areas, but were eliminated in the course of time from most places due to poaching³⁷ and cattle grazing. The latter leads to competition for water in summer and the cattle camps become the abodes for poachers. Perhaps around 100 tahr are found today in Thiruvannamalai and Upper Kodayar hills in KMTR and in Varaiattumudi in Neyyar Wildlife Sanctuary. If this population is well protected and the grasslands in the tahr habitats are managed by the judicious use of fire, then it is possible for this small population to build up and spread rapidly. We should endeavour to make this happen within the next two decades.

KMTR is reserved for the tiger² but it can support a maximum of 15 adult tigers. The reason for this low number of tigers is the low abundance of wild ungulate prey as the Reserve is not ecologically suitable to support a higher density of ungulates. Sambar and wild boar, the two ungulates available to the tiger throughout the Reserve, occur in very low densities. The foothill forests are not extensive (the available forests are heavily disturbed), the terrain is rocky and steep in many places, mid-elevation forests are dry in most places and together with rainforests are unproductive for ungulates.

Tiger conservation in the southern Western Ghats, therefore, should be planned on a landscape level covering a much larger area encompassing the forests of Kerala and Tamil Nadu. Ideas for such an area, the Periyar–

Kalakad Tiger Conservation Unit, an area of about 5000 km² of productive habitat, are already available³⁸. This tract, in fact, should be called as Megamalai–Kalakad Tiger Conservation Unit and include the wildlife rich areas, north of the Periyar Tiger Reserve. This unit has about 50 tigers but has the potential to support at least 100 tigers. Major conservation problems in this unit are poaching of prey species and elephant, plantations (*Eucalyptus*, coffee and cardamom), illegal cultivation of *ganja* (*Cannabis sativa*), growing pilgrimage to Sabarimalai temple and other shrines (accompanied by increasing biotic disturbances and garbage) and habitat fragmentation along the Ariankavu pass³⁹. It is possible to control poaching, acquire the coffee and cardamom plantations which the owners want to sell, reduce the problems caused by the pilgrimage and create a corridor across Ariankavu pass if the Forest Departments of Tamil Nadu and Kerala work together, activated and supported by conservationists.

Appendix 1. List of vertebrates found in Kalakad–Mundanthurai Tiger Reserve. Endemic species are marked with an asterisk for herpetofauna, birds and mammals. Bird species marked with @ are found around KMTR (mainly waterbirds). Sources for the herpetofauna, bird and mammal lists are given at the end of the Appendix.

(a) Fishes recorded from the Reserve (during the early 1980s). Family names are changed according to Talwar and Jhingran⁴⁰.

- I. Family: Gobiidae
 1. *Glossogobius giuris*
- II. Family: Mastacembelidae
 2. *Mastacembelus armatus*
- III. Family: Channidae
 3. *Channa striatus*
 4. *Channa orientalis* (*C. gachua*)
- IV. Family: Cichlidae
 5. *Eetroplus maculatus*
 6. *Eetroplus suratensis*
 7. *Oreochormis mossambica* (*Tilapia mossambica*)
- V. Family: Siluridae
 8. *Macrones vittatus* (*Macrones vittatus*)
 9. *Ompak bimaculatus* (*Callichrous bimaculatus*)
 10. *Heteropneustes fossilis* (*Saccobranchus fossilis*)
- VI. Family: Belonidae
 11. *Xenentodon cancila* (*Belone cancila*)
- VII. Family: Aplocheilidae
 12. *Aplocheilus lineatus* (*Haplocheilus rubrostigma*)
 13. *H. lineatus* synonym of *Aplocheilus lineatus*
- VIII. Family: Cyprinidae
 14. *Bhavana australis* (*Homaloptera brucei*)
 15. *Gara lissorhynchus* (*Discognathus modestus*)
 16. *Cyprinus carpio communis*
 17. *Labeo funbriatus*
 18. *L. calbasu*
 19. *Cirrhina mrigala*
 20. *Catla catla*
 21. *Puntius sarana sarana* (*Barbus sarana*)
 22. *Gonoproktopterus dubius* (*B. dubius*)
 23. *B. carnaticus*
 24. *Tor khudree* (*B. malabaricus*)
 25. *Puntius amphibius* (*B. amphibius*)
 26. *Puntius arulius* (*B. arulius*)
 27. *Puntius filamentosus* (*B. mahecola*)
 28. *Puntius sophore* (*B. stigma*)
 29. *Parluciosoma daniconius* (*Rasbora daniconius*)
 30. *Danio aequipinnatus*
 31. *Salmostoma sardinella* (*Chela untrahi*)
 32. *Nemacheilus pulchellus*
- IX. Family: Anguillidae
 33. *Anguilla bengalensis*

(b) Amphibians recorded from the Reserve (includes unidentified species).

- I. Family: Ichthyophidae
 1. *Ichthyophis* species 1
 2. *Ichthyophis* species 2
- II. Family: Uraeothylidae
 3. *Uraeotyphlus malabaricus**
- III. Family: Bufonidae
 4. *Bufo melanostictus*
 5. *B. beddomi**
 6. *B. microtypanum**
 7. *B. species*
 8. *B. fergusoni*
- IV. Family: Microhylidae
 9. *Melanobatrachus indicus**
 10. *Ramanella montana**
 11. *Microhyla ornata*
 12. *M. rubra*
- V. Family: Rhacophoridae
 13. *Philautus variabilis**
 14. *P. pulcherrimus**
 15. *P. charius**
 16. *P. glandulosus**
 17. *P. species*
 18. *Polypedates maculatus*
 19. *Rhacophorus calcadensis**
- VI. Family: Ranidae
 20. *Euphylyctis cyanophlyctis*
 21. *Indirana beddomi**
 22. *I. brachytarsus**
 23. *I. leptodactyla**
 24. *I. diplostictus**
 25. *Limnonectes keralensis*
 26. *L. limnocharis*
 27. *Micrixalus fuscus**
 28. *M. saxicola**
 29. *M. species*
 30. *Nyctibatrachus alicae**
 31. *N. major**
 32. *N. vasanthi**
 33. *N. beddomi**
 34. *Rana aurantiaca**
 35. *R. curtipis**
 36. *R. temporalis**
 37. *Tomopterna rolande*

(c) Reptiles recorded from the Reserve (during 1996–1998).

- I. Family: Bataguridae
 1. *Melanochelys trijuga*

2. *Geoemyda silvatica**
 3. *Geochelone elegans**
- II. Family: Gekkonidae
4. *Cnemaspis indica**
 5. *C. ornatus**
 6. *C. beddomei**
 7. *Cnemaspis* spp. 1
 8. *Cnemaspis* spp. 2 (yellow throat)
 9. *Cnemaspis* spp. 3 (red eyed gecko)
 10. *Hemidactylus anamallensis* (= *Dravidogecko anamallensis*)*
 11. *Hemidactylus leschenaulti*
 12. *H. maculatus*
 13. *H. triedrus*
 14. *H. brookii*
 15. *H. frenatus*
- III. Family: Agamidae
16. *Calotes andamanensis**
 17. *C. calotes*
 18. *C. ellioti**
 19. *C. rouxii**
 20. *C. nemoricola**
 21. *C. grandisquamis**
 22. *Draco dussumieri**
 23. *Otocryptis beddomii**
 24. *Psammophilus blanfordianus*
 25. *P. dorsalis*
 26. *Calotes versicolor*
 27. *Sitana ponticeriana*
- IV. Family: Chamaeleonidae
28. *Chamaeleo zeylanicus*
- V. Family: Scincidae
29. *Mabuya macularicus*
 30. *M. carinata*
 31. *M. beddomii*
 32. *Scincella travancoricum* (= *Liolopisma travancoricum*)*
 33. *Ristella* spp.
 34. *Dasia halianus*
 35. *Lygosoma punctatus*
 36. *Mabuya gansi*⁴⁵*
 37. *Sphenomorphus dussumieri*
- VI. Family: Varanidae
38. *Varanus bengalensis*
- VII. Family: Typhlopidae
39. *Ramphotyphlops braminus*
- VIII. Family: Uropeltidae
40. *Brachyophidium rhodogaster**
 41. *Melanophidium punctatum**
 42. *Uropeltis arcticeps**
 43. *U. ellioti**
 44. *U. ocellata**
 45. *Uropeltis* spp.
 46. *Teretrurus sanguineus**
 47. *Uropeltis liura**
- IX. Family: Boidae
48. *Python molurus*
- X. Family: Colubridae
49. *Ahaetulla dispar**
 50. *A. nasutus*
 51. *A. perrotetti**
 52. *A. pulverulenta*
 53. *Amphiesma beddomei**
 54. *Boiga ceylonensis*
 55. *B. forsteni*
 56. *Dendrelaphis grandoculis**
 57. *D. tristis*
 58. *Lycodon aulicus*
 59. *L. travancoricus**
 60. *Lycodon* spp.
 61. *Macropisthodon plumbicolor*
 62. *Oligodon arnensis*
 63. *O. brevicaudus**
 64. *Coluber mucosus*
 65. *Xenochropis piscator*
 66. *Amphiesma stolata*
 67. *Boiga trigonatus*
 68. *Chrysopelea ornata*
 69. *Elaphe helena*
 70. *Liopeltis calamaria*
 71. *Oligodon taeniolata*
- XI. Family: Elapidae
72. *Ophiophagus hannah*
 73. *Calliophis melanurus nigrescens**
 74. *Bungarus caeruleus*
 75. *Naja naja*
- XII. Family: Viperidae
76. *Hypnale hypnale*
 77. *Trimeresurus gramineus*
 78. *T. malabaricus**
 79. *T. macrolepis**
 80. *T. strigatus**
 81. *Vipera russelii*
- (d) **Birds recorded in and around KMTR (1991–1999).**
1. *Francolinus pondicerianus* Grey Francolin
 2. *Coturnix coromandelica* Rain Quail[@]
 3. *Perdicula asiatica* Jungle Bush Quail
 4. *Turnix sylvatica* Small Buttonquail
 5. *Turnix tanki* Yellow-legged Buttonquail
 6. *Turnix suscitator* Barred Buttonquail
 7. *Galloperdix spadicea* Red Spurfowl
 8. *Galloperdix lunulata* Painted Spurfowl
 9. *Gallus sonneratii* Grey Junglefowl
 10. *Pavo cristatus* Indian Peafowl
 11. *Anser indicus* Bar-headed Goose
 12. *Dendrocygna javanica* Lesser Whistling-duck[@]
 13. *Nettapus coromandelianus* Cotton Pygmy-goose[@]
 14. *Anas poecilorhyncha* Spot-billed Duck[@]
 15. *Anas acuta* Northern Pintail[@]
 16. *Jynx torquilla* Eurasian Wryneck
 17. *Picumnus innominatus* Speckled Piculet
 18. *Celeus brachyurus* Rufous Woodpecker
 19. *Dryocopus javensis* White-bellied Woodpecker
 20. *Dendrocopos nanus* Brown-capped Pygmy Woodpecker
 21. *Picus chlorolophus* Lesser Yellownap
 22. *Picus xanthopygaeus* Streak-throated Woodpecker
 23. *Dinopium javanense* Common Flameback
 24. *Dinopium benghalense* Black-rumped Flameback
 25. *Chrysocolaptes lucidus* Greater Flameback
 26. *Megalaima zeylanica* Brown-headed Barbet
 27. *Megalaima viridis* White-cheeked Barbet
 28. *Megalaima rubricapilla* Crimson-fronted Barbet
 29. *Megalaima haemacephala* Coppersmith Barbet
 30. *Ocyrceros griseus* Malabar Grey Hornbill*

31. <i>Buceros bicornis</i>	Great Hornbill	98. <i>Himantopus himantopus</i>	Black-winged Stilt
32. <i>Upupa epops</i>	Common Hoopoe	99. <i>Charadrius dubius</i>	Little Ringed Plover
33. <i>Harpactes fasciatus</i>	Malabar Trogon	100. <i>Vanellus malabaricus</i>	Yellow-wattled Lapwing
34. <i>Coracias benghalensis</i>	Indian Roller	101. <i>Vanellus indicus</i>	Red-wattled Lapwing
35. <i>Alcedo atthis</i>	Common Kingfisher	102. <i>Sterna aurantia</i>	River Tern
36. <i>Ceyx erithacus</i>	Oriental Dwarf Kingfisher	103. <i>Chlidonias hybridus</i>	Whiskered Tern [@]
37. <i>Halcyon capensis</i>	Stork-billed Kingfisher	104. <i>Pandion haliaetus</i>	Osprey
38. <i>Halcyon smyrnensis</i>	White-throated Kingfisher	105. <i>Aviceda jerdoni</i>	Jerdon's Baza
39. <i>Halcyon pileata</i>	Black-capped Kingfisher	106. <i>Aviceda leuphotes</i>	Black Baza
40. <i>Ceryle rudis</i>	Pied Kingfisher	107. <i>Elanus caeruleus</i>	Black-shouldered Kite
41. <i>Merops orientalis</i>	Green Bee-eater	108. <i>Milvus migrans</i>	Black Kite
42. <i>Merops philippinus</i>	Blue-tailed Bee-eater	109. <i>Haliastur indus</i>	Brahminy Kite
43. <i>Merops leschenaulti</i>	Chestnut-headed Bee-eater	110. <i>Ichthyophaga ichthyaetus</i>	Grey-headed Fish Eagle
44. <i>Clamator jacobinus</i>	Pied Cuckoo	111. <i>Neophron percnopterus</i>	Egyptian Vulture [@]
45. <i>Clamator coromandus</i>	Chestnut-winged Cuckoo	112. <i>Sarcogyps calvus</i>	Red-headed Vulture [@]
46. <i>Hierococcyx sparveroides</i>	Large Hawk Cuckoo	113. <i>Silornis cheela</i>	Crested Serpent Eagle
47. <i>Hierococcyx varius</i>	Common Hawk Cuckoo	114. <i>Circus pygargus</i>	Pallid Harrier ^{@?}
48. <i>Cuculus micropterus</i>	Indian Cuckoo	115. <i>Accipiter trivirgatus</i>	Crested Goshawk
49. <i>Cuculus poliocephalus</i>	Lesser Cuckoo	116. <i>Accipiter badius</i>	Shikra
50. <i>Cacomantis passerinus</i>	Grey-bellied Cuckoo	117. <i>Accipiter virgatus</i>	Besra
51. <i>Surniculus lugubris</i>	Drongo Cuckoo	118. <i>Accipiter nisus</i>	Eurasian Sparrowhawk
52. <i>Eudynamis scolopacea</i>	Asian Koel	119. <i>Pernis ptilorhynchus</i>	Oriental Honey-buzzard
53. <i>Phaenicophaeus viridirostris</i>	Blue-faced Malkoha	120. <i>Buteo buteo japonicus</i>	Common Buzzard
54. <i>Phaenicophaeus leschenaulti</i>	Sirkeer Malkoha	121. <i>Buteo rufinus</i>	Long-legged Buzzard
55. <i>Centropus sinensis</i>	Greater Coucal	122. <i>Aquila rapax</i>	Tawny Eagle
56. <i>Loriculus vernalis</i>	Vernal Hanging Parrot	123. <i>Hieraaetus pennatus</i>	Booted Eagle
57. <i>Psittacula krameri</i>	Rose-ringed Parakeet	124. <i>Hieraaetus kienerii</i>	Rufous-bellied Eagle
58. <i>Psittacula cyanocephala</i>	Plum-headed Parakeet	125. <i>Spizaetus cirrhatus cirrhatus</i>	Changeable Hawk Eagle
59. <i>Psittacula columboides</i>	Malabar Parakeet*	126. <i>Falco tinnunculus</i>	Kestrel
60. <i>Collocalia unicolor</i>	Indian Swiftlet	127. <i>Falco subbuteo</i>	Eurasian Hobby?
61. <i>Zoonavena sylvatica</i>	White-rumped Needletail	128. <i>Falco jugger</i>	Laggar Falcon
62. <i>Cypsiurus balasiensis</i>	Asian Palm Swift	129. <i>Tachybaptus ruficollis</i>	Little Grebe [@]
63. <i>Apus affinis</i>	House Swift	130. <i>Anhinga melanogaster</i>	Darter
64. <i>Apus pacificus</i>	Fork-tailed Swift	131. <i>Phalacrocorax niger</i>	Little Cormorant
65. <i>Tachymarpis melba</i>	Alpine Swift	132. <i>Phalacrocorax carbo</i>	Great Cormorant
66. <i>Hemiprocne coronata</i>	Crested Treeswift	133. <i>Egretta garzetta</i>	Little Egret [@]
67. <i>Phodilus badius</i>	Oriental Bay Owl	134. <i>Casmerodius albus</i>	Great Egret [@]
68. <i>Otus sunia</i>	Oriental Scops Owl	135. <i>Mesophoyx intermedia</i>	Intermediate Egret [@]
69. <i>Otus bakkamoena</i>	Collared Scops Owl	136. <i>Bubulcus ibis</i>	Cattle Egret [@]
70. <i>Bubo bubo</i>	Eurasian Eagle Owl	137. <i>Ardeola grayii</i>	Indian Pond Heron
71. <i>Bubo nipalensis</i>	Spot-bellied Eagle Owl	138. <i>Ardea cinerea</i>	Grey Heron
72. <i>Ketupa zeylonensis</i>	Brown Fish Owl	139. <i>Butorides striatus</i>	Little Heron
73. <i>Strix leptogrammica</i>	Brown Wood Owl	140. <i>Nycticorax nycticorax</i>	Black-crowned Night Heron
74. <i>Glaucidium radiatum</i>	Jungle Owlet	141. <i>Gorsachius melanolophus</i>	Malayan Night Heron
75. <i>Athene brama</i>	Spotted Owlet	142. <i>Dupetor flavicollis</i>	Black Bittern
76. <i>Ninox scutulata</i>	Brown Hawk Owl	143. <i>Plegadis falcinellus</i>	Glossy Ibis [@]
77. <i>Batrachostomus moniliger</i>	Sri Lanka Frogmouth	144. <i>Threskiornis melanocephalus</i>	Black-headed Ibis [@]
78. <i>Caprimulgus indicus</i>	Grey Nightjar	145. <i>Pseudibis papillosa</i>	Black Ibis [@]
79. <i>Caprimulgus macrurus</i>	Large-tailed Nightjar	146. <i>Platalea leucorodia</i>	Eurasian Spoonbill [@]
80. <i>Caprimulgus asiaticus</i>	Indian Nightjar	147. <i>Pelecanus philippensis</i>	Spot-billed Pelican [@]
81. <i>Columba livia</i>	Rock Pigeon	148. <i>Mycteria leucocephala</i>	Painted Stork [@]
82. <i>Columba elphinstonii</i>	Nilgiri Wood Pigeon*	149. <i>Anastomus oscitans</i>	Asian Openbill [@]
83. <i>Ducula badia</i>	Mountain Imperial Pigeon	150. <i>Pitta brachyura</i>	Indian Pitta
84. <i>Streptopelia senegalensis</i>	Laughing Dove	151. <i>Irena puella</i>	Asian Fairy Bluebird
85. <i>Streptopelia chinensis</i>	Spotted Dove	152. <i>Chloropsis cochinchinensis</i>	Blue-winged Leafbird
86. <i>Streptopelia decaocto</i>	Eurasian Collared Dove	153. <i>Chloropsis aurifrons</i>	Golden-fronted Leafbird
87. <i>Chalcophaps indica</i>	Emerald Dove	154. <i>Lanius cristatus</i>	Brown Shrike
88. <i>Treron pompadora</i>	Pompadour Green Pigeon	155. <i>Lanius vittatus</i>	Bay-backed Shrike
89. <i>Rallina eurizonoides</i>	Slaty-legged Crake	156. <i>Lanius meridionalis</i>	Southern Grey Shrike
90. <i>Amaurornis phoenicurus</i>	White-breasted Waterhen [@]	157. <i>Dendrocitta vagabunda</i>	Rufous Treepie
91. <i>Porphyrio porphyrio</i>	Purple Swamphen [@]	158. <i>Dendrocitta leucogastra</i>	White-bellied Treepie
92. <i>Gallinula chloropus</i>	Common Moorhen [@]	159. <i>Corvus splendens</i>	House Crow
93. <i>Fulica atra</i>	Common Coot [@]	160. <i>Corvus macrorhynchos</i>	Large-billed Crow
94. <i>Gallinago sp.</i>	? Snipe	161. <i>Artamus fuscus</i>	Ashy Woodswallow
95. <i>Tringa ochropus</i>	Green Sandpiper	162. <i>Oriolus oriolus</i>	Eurasian Golden Oriole
96. <i>Actitis hypoleucos</i>	Common Sandpiper	163. <i>Oriolus xanthornus</i>	Black-hooded Oriole
97. <i>Burhinus oedicephalus</i>	Eurasian Thick-Knee	164. <i>Coracina macei</i>	Large Cuckooshrike

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165. <i>Coracina melanoptera</i>	Black-headed Cuckooshrike	227. <i>Locustella naevia</i>	Grasshopper Warbler
166. <i>Pericrocotus cinnamomeus</i>	Small Minivet	228. <i>Acrocephalus dumetorum</i>	Blyth's Reed Warbler
167. <i>Pericrocotus flammeus</i>	Scarlet Minivet	229. <i>Acrocephalus aedon</i>	Thick-billed Warbler
168. <i>Hemipus picatus</i>	Bar-winged Flycatcher-shrike	230. <i>Schoenicola platyura</i>	Broad-tailed Grassbird*
169. <i>Dicrurus macrocercus</i>	Black Drongo	231. <i>Sylvia hortensis</i>	Orphean Warbler
170. <i>Dicrurus leucophaeus</i>	Ashy Drongo	232. <i>Orthotomus sutorius</i>	Common Tailorbird
171. <i>Dicrurus caerulescens</i>	White-bellied Drongo	233. <i>Phylloscopus trochiloides</i>	Greenish Warbler
172. <i>Dicrurus aeneus</i>	Bronzed Drongo	234. <i>Phylloscopus magnirostris</i>	Large-billed Leaf Warbler
173. <i>Dicrurus paradiseus</i>	Greater Racket-tailed Drongo	235. <i>Phylloscopus occipitalis</i>	Western Crowned Warbler
174. <i>Hypothymis azurea</i>	Black-naped Monarch	236. <i>Garrulax delesserti</i>	Wynaad Laughingthrush*
175. <i>Terpsiphone paradisi</i>	Asian Paradise-Flycatcher	237. <i>Garrulax jerdoni</i>	Grey-breasted Laughingthrush*
176. <i>Aegithina tiphia</i>	Common Iora	238. <i>Pellorneum ruficeps</i>	Puff-throated Babbler
177. <i>Tephrodornis gularis</i>	Large Woodshrike	239. <i>Pomatorhinus horsfieldii</i>	Indian Scimitar Babbler
178. <i>Tephrodornis pondicerianus</i>	Common Woodshrike	240. <i>Dumetia hyperythra</i>	Tawny-bellied Babbler
179. <i>Monticola solitarius</i>	Blue Rock Thrush	241. <i>Rhopocichla atriceps</i>	Dark-fronted Babbler
180. <i>Myophonus horsfieldii</i>	Malabar Whistling Thrush	242. <i>Chrysomma sinense</i>	Yellow-eyed Babbler
181. <i>Zoothera wardii</i>	Pied Thrush	243. <i>Turdoides subrufus</i>	Rufous Babbler*
182. <i>Zoothera citrina</i>	Orange-headed Thrush	244. <i>Turdoides striatus</i>	Jungle Babbler
183. <i>Zoothera dauma</i>	Scaly Thrush	245. <i>Turdoides affinis</i>	Yellow-billed Babbler
184. <i>Turdus merula</i>	Eurasian Blackbird	246. <i>Alcippe poioicephala</i>	Brown-cheeked Fulvetta
185. <i>Brachypteryx major</i>	White-bellied Shortwing*	247. <i>Mirafra cantillans</i>	Singing Bushlark
186. <i>Muscicapa dauurica</i>	Asian Brown Flycatcher	248. <i>Mirafra erythroptera</i>	Indian Bushlark
187. <i>Muscicapa ruficauda</i>	Rusty-tailed Flycatcher	249. <i>Eremopterix grisea</i>	Ashy-crowned Sparrow Lark
188. <i>Muscicapa muttui</i>	Brown-breasted Flycatcher	250. <i>Alauda arvensis</i>	Eurasian Skylark
189. <i>Ficedula parva</i>	Red-throated Flycatcher	251. <i>Dicaeum agile</i>	Thick-billed Flowerpecker
190. <i>Ficedula nigrorufa</i>	Black-and-orange Flycatcher*	252. <i>Dicaeum erythrorhynchos</i>	Pale-billed Flowerpecker
191. <i>Eumyias thalassina</i>	Verditer Flycatcher	253. <i>Dicaeum concolor</i>	Plain Flowerpecker
192. <i>Eumyias albicaudata</i>	Nilgiri Flycatcher*	254. <i>Nectarinia zeylonica</i>	Purple-rumped Sunbird
193. <i>Cyornis pallipes</i>	White-bellied Blue Flycatcher*	255. <i>Nectarinia minima</i>	Crimson-backed Sunbird*
194. <i>Cyornis rubeculoides</i>	Blue-throated Flycatcher	256. <i>Nectarinia asiatica</i>	Purple Sunbird
195. <i>Cyornis tickelliae</i>	Tickell's Blue Flycatcher	257. <i>Nectarinia lotenia</i>	Loten's Sunbird
196. <i>Culicicapa ceylonensis</i>	Grey-headed Canary Flycatcher	258. <i>Arachnothera longirostra</i>	Little Spiderhunter
197. <i>Luscinia brunnea</i>	Indian Blue Robin	259. <i>Passer domesticus</i>	House Sparrow
198. <i>Copsychus saularis</i>	Oriental Magpie Robin	260. <i>Dendronanthus indicus</i>	Forest Wagtail
199. <i>Saxicoloides fulvicata</i>	Indian Robin	261. <i>Motacilla alba</i>	White Wagtail
200. <i>Phoenicurus ochruros</i>	Black Redstart	262. <i>Motacilla maderaspatensis</i>	White-browed Wagtail
201. <i>Saxicola caprata</i>	Pied Bushchat	263. <i>Motacilla flava</i>	Yellow Wagtail
202. <i>Sturnus malabaricus</i>	Chestnut-tailed Starling	264. <i>Motacilla cinerea</i>	Grey Wagtail
203. <i>Sturnus pagodarum</i>	Brahminy Starling	265. <i>Anthus nilghiriensis</i>	Nilgiri Pipit*
204. <i>Acridotheres tristis</i>	Common Myna	266. <i>Anthus rufulus</i>	Paddyfield Pipit
205. <i>Acridotheres fuscus</i>	Jungle Myna	267. <i>Ploceus philippinus</i>	Baya Weaver
206. <i>Gracula religiosa</i>	Hill Myna	268. <i>Lonchura malabarica</i>	Indian Silverbill
207. <i>Sitta frontalis</i>	Velvet-fronted Nuthatch	269. <i>Lonchura striata</i>	White-rumped Munia
208. <i>Parus xanthogenys</i>	Black-lored Tit	270. <i>Lonchura kelaarti</i>	Black-throated Munia
209. <i>Hirundo rupestris</i>	Eurasian Crag Martin?	271. <i>Lonchura punctulata</i>	Scaly-breasted Munia
210. <i>Hirundo concolor</i>	Dusky Crag Martin	272. <i>Lonchura malacca</i>	Black-headed Munia
211. <i>Hirundo rustica</i>	Barn Swallow	273. <i>Carpodacus erythrinus</i>	Common Rosefinch
212. <i>Hirundo tahitica</i>	Pacific Swallow		
213. <i>Hirundo smithii</i>	Wire-tailed Swallow		
214. <i>Hirundo daurica</i>	Red-rumped Swallow		
215. <i>Delichon urbica</i>	Northern House Martin		
216. <i>Pycnonotus priocephalus</i>	Grey-headed Bulbul*		
217. <i>Pycnonotus melanicterus</i>	Black-crested Bulbul		
218. <i>Pycnonotus jocosus</i>	Red-whiskered Bulbul		
219. <i>Pycnonotus cafer</i>	Red-vented Bulbul		
220. <i>Pycnonotus luteolus</i>	White-browed Bulbul		
221. <i>Iole indica</i>	Yellow-browed Bulbul		
222. <i>Hypsipetes leucocephalus</i>	Black Bulbul		
223. <i>Prinia hodgsonii</i>	Grey-breasted Prinia		
224. <i>Prinia sylvatica</i>	Jungle Prinia		
225. <i>Prinia socialis</i>	Ashy Prinia		
226. <i>Zosterops palpebrosus</i>	Oriental White-eye		

(e) Mammals recorded in the Reserve (during 1996–1998).

Order: Insectivora		
I.	Family: Erinaceidae	
	1. <i>Hemiechinus nudiventris</i>	Madras hedgehog
II.	Family: Soricidae	
	2. <i>Suncus dayi</i>	Day's shrew
	3. <i>Suncus murinus</i>	Grey musk shrew
	4. <i>Suncus montanus</i>	Hill (mountain) shrew
	5. <i>Suncus etruscus</i>	Pygmy shrew
Order: Chiroptera		
III.	Family: Pteropodidae	
	6. <i>Rousettus leschenaulti</i>	Fulvous fruit bat
	7. <i>Pteropus giganteus</i>	Indian flying fox
	8. <i>Cynopterus brachyotis</i>	Lesser dog-faced fruit bat
	9. <i>Cynopterus sphinx</i>	Short-nosed fruit bat
IV.	Family: Rhinopomatidae	
	10. <i>Rhinopoma hardwickii</i>	Lesser mouse-tailed bat

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V.	Family: Emballonuridae 11. <i>Taphozous melanopogon</i> 12. <i>Taphozous saccolamius</i>	Black-bearded tomb bat Pouch-bearing bat	XIX.	Order: Artiodactyla Family: Suidae 49. <i>Sus scrofa</i>	Wild boar
VI.	Family: Megadermatidae 13. <i>Megaderma lyra</i> 14. <i>Megaderma spasma</i>	Greater false vampire Lesser false vampire.	XX.	Family: Tragulidae 50. <i>Moschiola meminna</i>	Indian spotted chevrotain or mouse deer
VII.	Family: Rhinolophidae 15. <i>Rhinolophus rouxii</i> 16. <i>Rhinolophus lepidus</i> 17. <i>Rhinolophus beddomei</i>	Rufous horseshoe bat Blyth's horseshoe bat Lesser woolly horseshoe bat	XXI.	Family: Cervidae 51. <i>Muntiacus muntjak</i> 52. <i>Axis axis</i> 53. <i>Cervus unicolor</i>	Barking deer Chital Sambar
VIII.	Family: Hipposideridae 18. <i>Hipposideros ater</i> 19. <i>Hipposideros fulvus</i> 20. <i>Hipposideros speoris</i>	Dusky leaf-nosed bat Fulvous leaf-nosed bat Schneider's leaf-nosed bat	XXII.	Family: Bovidae 54. <i>Bos gaurus</i> 55. <i>Hemitragus hylocrius</i> *	Gaur Nilgiri tahr
IX.	Family: Vespertilionidae 21. <i>Pipistrellus mimus</i> 22. <i>Kerivoula picta</i> (?)	Evening bat Painted bat (?)	XXIII.	Order: Pholidota Family: Manidae 56. <i>Manis crassicaudata</i>	Indian pangolin
X.	Order: Primates Family: Lorisidae 23. <i>Loris tardigradus</i>	Slender loris	XXIV.	Order: Rodentia Family: Sciuridae 57. <i>Funambulus palmarum</i> 58. <i>Funambulus sublineatus</i> 59. <i>Funambulus tristriatus</i> * 60. <i>Ratufa indica</i>	Common palm squirrel Dusky striped squirrel Jungle striped squirrel Indian giant squirrel
XI.	Family: Cercopithecidae 24. <i>Macaca radiata</i> 25. <i>Macaca silenus</i> * 26. <i>Semnopithecus entellus</i> 27. <i>Trachypithecus johnii</i> *	Bonnet macaque Lion-tailed macaque Common langur Nilgiri langur	XXV.	SubFamily: Pteromyine 61. <i>Petaurista philippensis</i> 62. <i>Petinomys fuscocapillus</i> * (?)	Indian giant flying squirrel Travancore flying squirrel (?)
XII.	Order: Carnivora Family: Canidae 28. <i>Canis aureus</i> 29. <i>Vulpes bengalensis</i> 30. <i>Cuon alpinus</i>	Indian jackal Bengal fox (from outside PA) Dhole or Asiatic wild dog	XXVI.	Family: Muridae 63. <i>Platacanthomys lasiurus</i> * 64. <i>Tatera indica</i> 65. <i>Golunda ellioti</i> 66. <i>Millardia meltada</i> 67. <i>Rattus rattus wroughtoni</i> ** <i>R. r. rufescens</i> 68. <i>Cremnomys blanfordi</i> 69. <i>Mus booduga</i> 70. <i>Mus famulus</i> 71. <i>Mus musculus</i> 72. <i>Mus platythrix</i> 73. <i>Vandeleuria oleracea</i> 74. <i>Bandicota bengalensis</i> 75. <i>Bandicota indica</i>	Malabar spiny dormouse Indian gerbil Indian bush rat Soft-furred field rat or metad White-bellied wood rat White-tailed wood rat Indian field mouse Bonhote's mouse House mouse Spiny field mouse Indian long-tailed tree mouse Lesser bandicoot rat Large bandicoot rat
XIII.	Family: Ursidae 31. <i>Melursus ursinus</i>	Sloth bear	XXVII.	Family: Hystricidae 76. <i>Hystrix indica</i>	Indian porcupine
XIV.	Family: Mustelidae 32. <i>Martes gwatkinsi</i> * 33. <i>Lutra lutra</i> 34. <i>Lutrogale perspicillata</i> 35. <i>Amblonyx cinerea</i>	Nilgiri marten Common otter Smooth coated otter Oriental small clawed otter		Order: Lagomorpha 77. <i>Lepus nigricollis nigricollis</i>	Blacknaped hare
XV.	Family: Viverridae 36. <i>Viverricula indica</i> 37. <i>Paradoxurus hermaphroditus</i> 38. <i>Paradoxurus jerdoni</i> *	Small Indian civet Common palm civet Jerdon's (brown) palm civet			
XVI.	Family: Herpestidae 39. <i>Herpestes edwardsi</i> 40. <i>Herpestes fuscus</i> 41. <i>Herpestes smithii</i> 42. <i>Herpestes vitticollis</i> (?)	Common Indian mongoose Brown mongoose Ruddy mongoose Stripe-necked mongoose (?)			
XVII.	Family: Felidae 43. <i>Prionailurus bengalensis</i> 44. <i>Felis chaus</i> 45. <i>Prionailurus rubiginosus</i> 46. <i>Panthera pardus</i> 47. <i>Panthera tigris</i>	Leopard cat Jungle cat Rusty-spotted cat Leopard Tiger			
XVIII.	Order: Proboscidea Family: Elephantidae 48. <i>Elephas maximus</i>	Asian elephant			

Sources: Amphibians (K. Vasudevan, unpubl.); reptiles^{41–45} (N. M. Ishwar, unpubl.); birds (M. Katti *et al.*, unpubl.); mammals (A. Kumar, D. Mudappa and J. Ronald, pers. commun.). Nomenclature for birds follows Grimmett *et al.*⁴⁶.

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