



Conservation Area Series, 33

Fauna of
Bannerghatta National Park
(Karnataka)



ZOOLOGICAL SURVEY OF INDIA

Conservation Area Series, 33

Fauna of Bannerghatta National Park

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Kolkata**

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Fauna of
BANNERGHATTA NATIONAL PARK
Conservation Area Series

33

2007

1-141

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FAUNA OF BANNERGHATTA NATIONAL PARK, KARNATAKA – AN OVERVIEW

G. THIRUMALAI AND S. KRISHNAN

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130, Santhome High Road, Chennai – 600 028*

INTRODUCTION

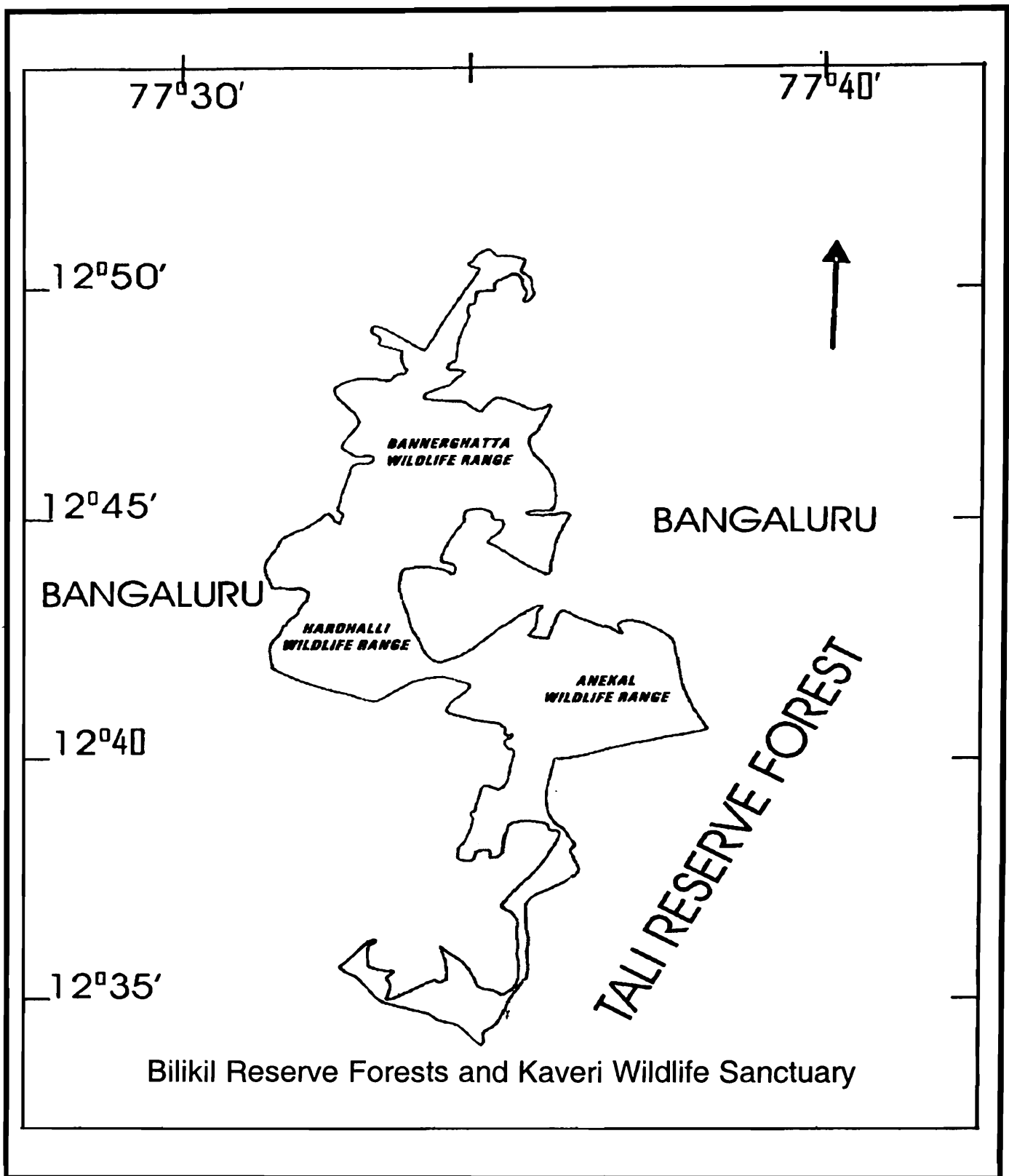
Bannerghatta National Park (BNP), Karnataka, spanning an area of 104.27 sq. km, is situated 22 km south of Bangalore, the capital of Karnataka state. Though initiated as a conservation area in 1971, the area was notified as a National Park on September 6, 1974. The park includes 10 reserve forests of Anekal range of the Bangalore Forest Division.

Bounded on the southeast by Tali Reserve Forest of Tamil Nadu, on the south by Bilikil Reserve Forest of Kanakapura and the Cauvery Wildlife Sanctuary, on the north by the city of Bangalore (Bangaluru) and on the east and west by agricultural fields, this Park has dry deciduous forests and thorny scrub cover with patches of moist deciduous forests along streams. The edaphic features of the Park include soils of sandy loam and red alluvium, while the rock formations are cryptocrystalline.

The mean altitude of BNP is 850 m above MSL with its terrain ranging from 700 m to 1046 m. The highest point in the Park is Doddaragihalli. The Suvarnamukhi stream which has its origin in the Suvarnamukhi Hill runs through the Park, discharging its contents in varying expanses throughout the year.

Located between 12° 48' 03" N latitude and 77° 34' 32" E longitude (Map), the Park experiences an annual rainfall of 700 mm and temperature ranging from 15° to 35° Celsius.

Apart from being a conservation area, the Park is also a relocation centre for lions and tigers rescued from circuses in the country that can be seen in securely fenced areas in the Park. The Park is open to visitors throughout the year. The tourist area is located in the north of the Park. The attractions to visitors are the Park Safaris (joy rides in vehicles and on elephant back to watch tigers, lions and herbivores), an aquarium, a zoo, a crocodile farm, a snake park, a pre-historic animal park, a museum, a children's park and the country's first butterfly park, established on November 25,



Map showing locality of Bannerghatta National Park, Bangalore, Karnataka.

2006. The butterfly park spreading over an area of 7.5 acres of land, comprises of a butterfly conservatory designed to support over 20 species of butterflies, a museum and an audio-visual room. Trekking enthusiasts too have places in the Park at Uddigebande, a natural rock formation called Hajjamana Kallu and Mirza Hill. The surrounding scenic hills have also many ancient temples.

The National Park is a treasure house of several species of wild flora and fauna.

FLORA

The floral composition of Karnataka is rich with 3500 species of flowering plants, including 1500 endemics (Manjrekar, 2000). The Park is predominantly a dry deciduous forest area with thorny scrub and patches of moist deciduous forests. Some of the trees found in the park are, *Anogeissus latifolia*, *Schleichera oleosa*, *Terminalia tomentosa*, *T. arjuna*, *Grewia tiliaefolia*, *Santalum album*, *Shorea talura*, *Emblica officinalis*, *vitex altissima*, *Wrightia tinctoria*, *Randia* sp., *Zizyphus* sp., and *Albizzia* sp. Bamboos are common in the park, the dominant species being the madar bamboo (*Dendrocalamus strictus*) which forms an understorey in many places. Plantations in the peripheral buffer zone comprise of *Eucalyptus*, *Bauhinia purpurea*, *Samanea saman* and *Peltophorum pttocarpum*.

FAUNA

The main inhabitants of BNP are elephants that migrate from the adjacent Tali Reserve Forests which are contiguous with the Cauvery Wildlife Sanctuary. They are in the habit of raiding crops along the way, on the periphery of the Park, causing conflict with man. Other animals of the Park include gaur, wild boars, leopards, sloth bears, jackals, hares, porcupines, pangolins, slender lorises, sambars, barking deer, spotted deer, and bonnet macaques, besides Monitor lizards, cobras, pythons, kraits and Russell's vipers. The Park is also home for a variety of birds such as cormorants, white ibis, grey heron, Paradise flycatcher, Tickell's Blue Flycatcher, common grey hornbill, white bellied Drongo, spotted owlet, Collared Scops owl, Mottled Wood owl, Eurasian Eagle Owl, Brown Fish Owl etc., to name a few. However, the faunal wealth of this National Park remains to be further explored. With this view, the Southern Regional Station (SRS), Zoological Survey of India (ZSI), Chennai undertook 4 intensive field surveys in the Park during the pre-monsoon and post-monsoon periods from 12-6-2002 to 2-7-2002, 12-3-2003 to 28-3-2003, 9-9-2003 to 20-9-2003 and 15-3-2004 to 25-3-2004. Accordingly, this volume reports the occurrence of 445 species under 295 genera of invertebrates and vertebrates. The representative number of genera and species recorded during the surveys from BNP is given below :

Sl. No.	Faunal Group	No. of Genera	No. of Species
1.	Rotifera	7	19
2.	Crustacea : Cladocera	9	17
3.	Crustacea : Copepoda	4	4
4.	Crustacea : Freshwater Prawns	2	8
5.	Crustacea : Brachyura : Crabs	5	7
6.	Insecta : Odonata	2	3
7.	Insecta : Mantodea	2	2
8.	Insecta : Hemiptera (Aquatic & Semiaquatic)	17	26
9.	Insecta : Lepidoptera : Rhopalocera	8	12
10.	Insecta : Diptera	12	12
11.	Insecta : Hymenoptera (Apocrita)	3	6
12.	Arachnida : Scorpionida	3	3
13.	Mollusca : Freshwater Gastropoda	5	8
14.	Pisces	20	26
15.	Amphibia	8	12
16.	Reptilia	12	14
17.	Aves	141	222
18.	Mammalia	35	44

ACKNOWLEDGEMENTS

All the contributors in this document are thankful to the Principal Chief Conservator of Forests & Chief Wildlife Warden of Karnataka Forest department, Bangalore. We express our sincere thanks to the Deputy Conservator of Forest, Range officers and other forest officials of BNP for logistic support and guidance. We also express our gratitude to the Director, Zoological Survey of India, Kolkata for facilities. The services rendered by the supporting staff of SRS/ZSI are gratefully acknowledged.

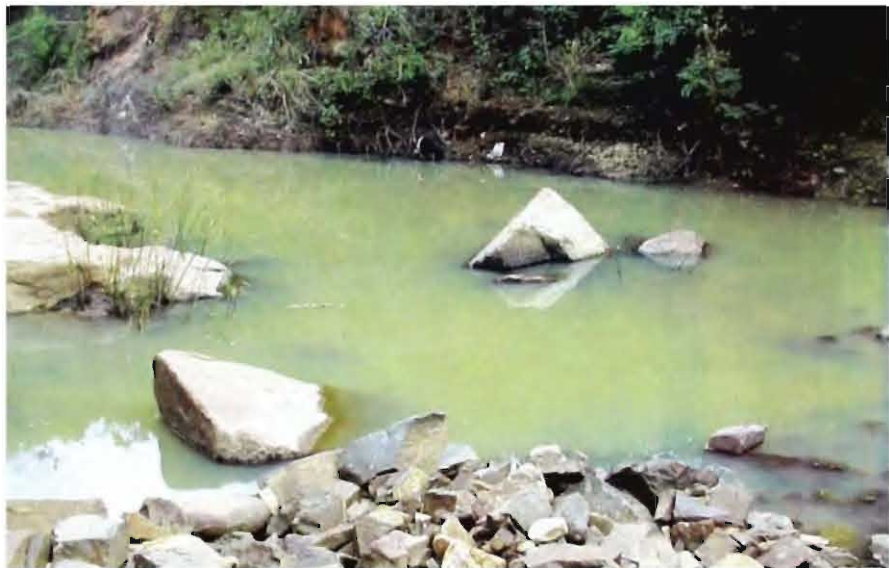
REFERENCE

Manjrekar, N. 2000. *A walk on the wildlife side*. An information Guide to National Parks and Wildlife Sanctuaries of Karnataka. Pub. PCCF (Wildlife) Karnataka Forest Department, Bangalore-3.

Varied habitat locations in Bannerghatta National Park (BNP)



Kaggla Halli



Uthiga Bundae



Gabbadi Kere

Varied habitat locations in Bannerghatta National Park (BNP)

Cuttala Halli



Jamballa

Muni Nagara



Some Crustaceans of Bannerghatta National Park (BNP)



1. *Barytelphusa (Barytelphusa) cunicularis* (Westwood)



2. *Barytelphusa (Barytelphusa) guerini* (Milne-Edwards)



3. *Gubernatoriana gubernatoris* (Alcock)



4. *Travancoriana pollicaris* (Alcock)



5. *Travancoriana schirnerae* Bott



6. *Spiralothelphusa hydrodroma* (Herbst.)



7. *Oziotelphusa senex senex* (Fabricius)



8. *Caridina gurneyi* Jaliha et al.



9. *Caridina kunnathurensis* Richard & Chandran



10. *Caridina williamsoni* Jaliha et al.

Some Crustaceans Freshwater Gastropods and Scorpions of BNP

1. *Bellamya bengalensis*



2. *Bellamya dissimilis*



3. *Thiara (Thiara) scabra*



4. *Heterometrus (Chersonesometrus) kanarensis*
(Pocock)



5. *Stenochirus politus* (Pocock)



6. *Lychas (Endotrichus) tricarlinatus* Simon

Some Odonata and Butterflies of BNP



Trithemis aurora (Burmeister)



Trithemis festiva (Rambur)



Agriocnemis pygmaea (Rambur)



Pachliopta hector (Linnaeus)



Papilio polytes Linnaeus



Papilio demoleus Linnaeus

Some Butterflies of BNP



Euploea core (Cramer)



Danaus chrysippus (Linnaeus)



Danaus genutia Cramer



Phalanta phalantha Drury



Catopsilia pomona (Fab.)



Eurema hecabe (Linnaeus)

Some Fishes of BNP



1. *Salmostoma clupeoides* (Bloch)



2. *Danio malabaricus* (Jerdon)



3. *Rasbora caverii* (Jerdon)



4. *Cyprinus carpio communis* (Linnaeus)



5. *Puntius bimaculatus* (Bleeker)

Some Fishes of BNP



6. *Puntius chola* (Hamilton)



7. *Puntius dorsalis* (Jerdon)



8. *Labeo ariza* (Hamilton)



9. *Schistura denisoni denisoni* (Day)

Some Fishes of BNP



10. *Lepidocephalus thermalis* (Val.)



11. *Garra mullya* (Sykes)



12. *Oreochromis mossambica* (Peters)



13. *Channa orientalis* (Schn.)



14. *Poecilia reticulata* (Peters)

Some Herpetofauna of BNP



1. *Duttaphrynus melanostictus* (Schn.)



2. *Hoplobatrachus tigerinus* (Daudin)



3. *Fejervarya keralensis* (Dubois)



4. *Microhyla ornata* (Dum. & Bibron)



5. *Microhyla rubra* (Jerdon)

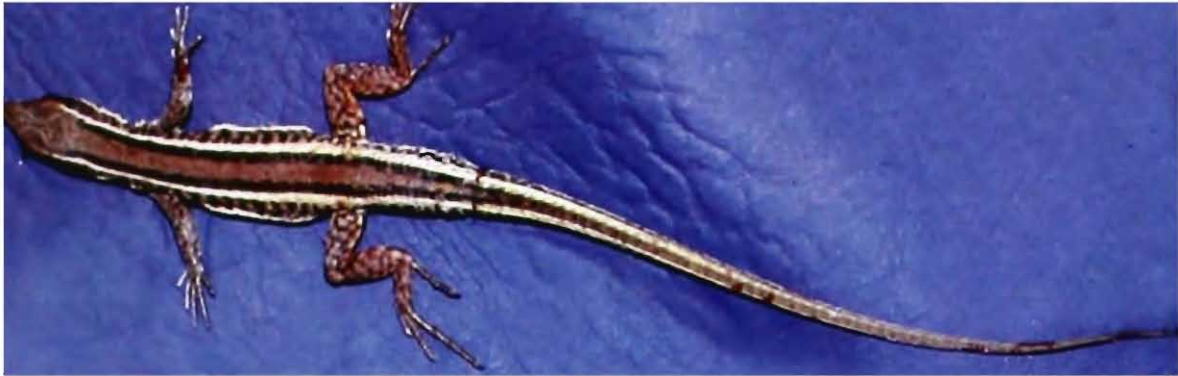


6. *Cnemaspis indica* (Gray)



7. *Psammophilus dorsalis* (Gray)

Some Herpetofauna of BNP



8. *Ophisop jerdoni* Blyth



9. *Hemidactylus triedrus* (Daudin)



10. *Hemidactylus frenatus* Schlegel



11. *Ramphotyphlops braminus* (Daudin)



12. *Typhlops porrectus* Stoliczka

Some Birds of BNP



Red-whiskered Bulbul



Yellow-browed Bulbul



Jungle Myna



Grey-headed Flycatcher



Gold-mantled Leafbird



Jungle Babbler

Some Birds of BNP



Paradise Flycatcher



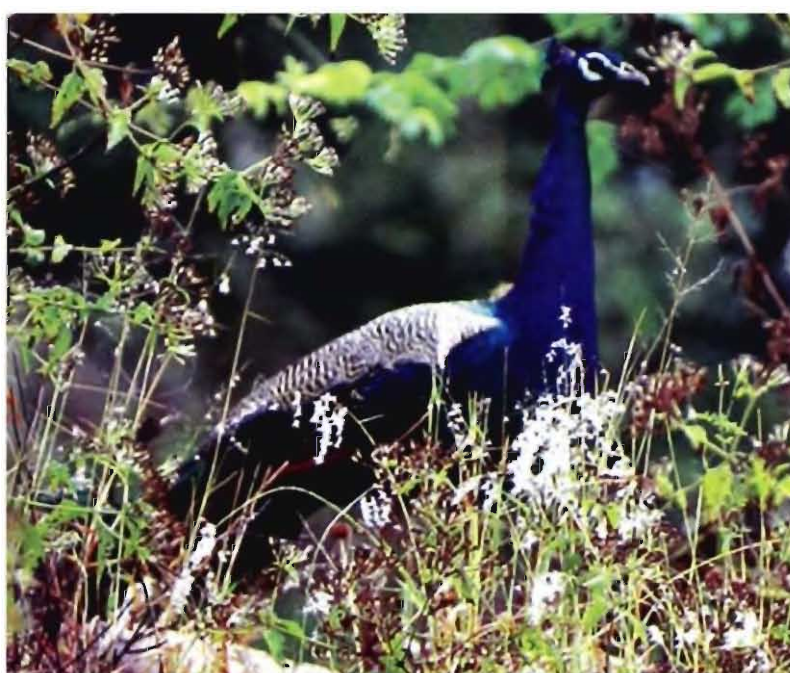
Brown-headed Barbet



Purple-rumped Sunbird

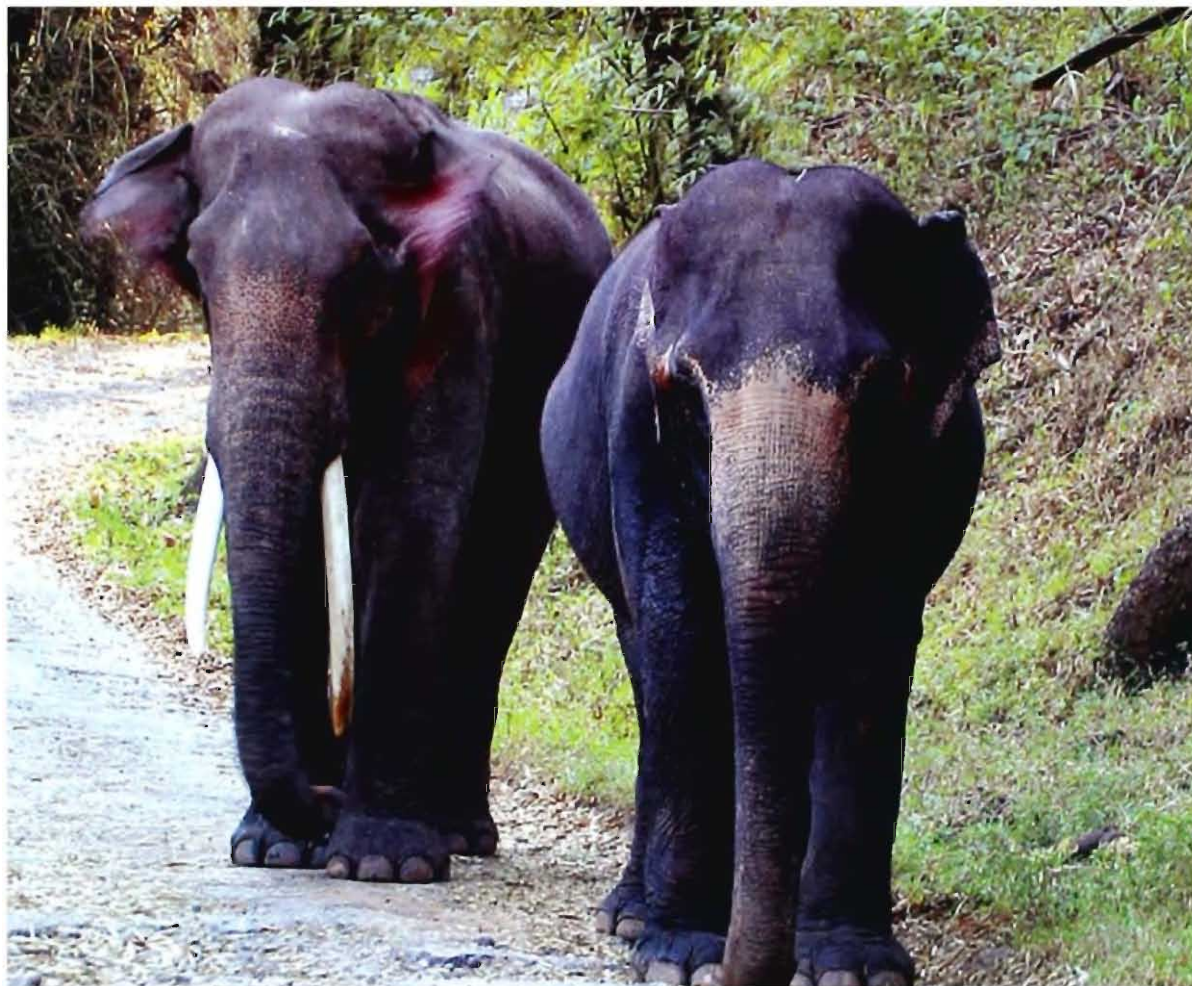


Common Hoopoe



Indian Peafowl

Some Mammals of BNP



Indian Elephant



Gaur

Some Mammals of BNP



Sloth Bear



Spotted Deer



Indian Wild Boar

Some Mammals of BNP



Indian Flying Fox



Nilgiri Langur



Indian Palm Squirrel

ROTIFERA

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INTRODUCTION

Systematic studies on the rotifer fauna of Karnataka were made by Patil and Gouder (1982a, 1982b, 1985). Sharma and Michael (1980) presented a synopsis of taxonomic studies on 62 species of Indian Rotifera from Karnataka. With reference to Bannerghatta national Park, since no earlier studies are available, this will form the first report from this National Park.

SYSTEMATIC LIST

Phylum	ROTIFERA
Superorder	MONOGONONTA
Order	PLOIMIDA
Family	BRACHIONIDAE

1. *Brachionus angularis* Gosse, 1851
- 2(a). *Brachionus bidentata bidentata* Anderson, 1889
- 2(b). *Brachionus bidentata jirovci* (Bartos, 1949)
- 3(a). *Brachionus calyciflorus f. anuraeformis* (Brehm, 1909)
- 3(b). *Brachionus calyciflorus f. borgerti* (Apstein, 1907)
- 3(c). *Brachionus calyciflorus f. dorcas* (Gosse, 1851)
- 3(d). *Brachionus calyciflorus var. hymani* Dhanapathi, 1974.
4. *Brachionus caudatus personatus* (Ahlstrom, 1940)
5. *Brachionus diversicornis* (Daday, 1883)

*Present address : Department of Genetics, Ayya Nadar Janaki Ammal College, Sivakasi-626 124, Tamil Nadu.

6. *Brachionus durgae* Dhanapathi, 1974.
7. *Brachionus falcatus* Zacharias, 1893
- 8(a). *Brachionus forficula forficula* Wierzejski, 1891
- 8(b). *Brachionus forficula minor* (Voronkov, 1913)
9. *Brachionus plicatilis* Muller, 1786.
10. *Brachionus rubens* Ehrenberg, 1838
11. *Brachionus urceolaris* (Muller, 1773)
12. *Keratella tropica* (Apstein, 1907)

Family LECANIDAE

13. *Lecane (Monostyla) clasterocerca* (Schmarda, 1859)

Family ASPLANCHNIDAE

14. *Asplanchna brightwelli* Gosse, 1850
15. *Asplanchna priodanta* Gosse, 1850
16. *Asplanchnopus bhimavaramensis* Dhanapathi, 1975.

Family CONOCHILIDAE

17. *Conochilus unicornis* Rousselet, 1892

Family TROCHOSPHAERIDAE

18. *Horaella brehmi* Donner, 1949

Family TESTUDINELLIDAE

19. *Pompholyx sulcata* Hudson, 1885

SYSTEMATIC ACCOUNT

1. *Brachionus angularis* Gosse, 1851

1851. *Brachionus angularis* Gosse, *Ann. Mag. Nat. Hist. Ser. 2*, 8 : 203

1998. *Brachionus angularis* Gosse, *Fauna of West Bengal, State Fauna Series*, 3(Part-11) : 354.

Material examined : 5sexs; Dhoddanikere, 15-iii-2003, S. Krishnan.

Distribution : Andhra Pradesh, Assam, Chandigarh, Delhi, Haryana, Jammu and Kashmir, Madhya Pradesh, Maharashtra, Punjab, West Bengal.

2(a). *Brachionus bidentata bidentata* Anderson, 1889

1889. *Brachionus bidentata* Anderson. *J. Asiatic. Soc. Bengal*, **58** : 352

1998. *Brachionus bidentata bidentata* Anderson. *Fauna of West Bengal, State Fauna Series*, **3**(Part-11) : 354-355.

Material examined : Sexs; Jobkhanalle, 16-iii-2003, S. Krishnan.

Distribution : Andhra Pradesh, Haryana, Orissa, West Bengal.

2(b). *Brachionus bidentata jirovci* (Bartos, 1949)

1946. *Brachionus bidentata* var. *jirovci* Bartos. *Entomal.*, **9** : 146

1998. *Brachionus bidentata jirovci* (Bartos). *State Fauna Series 3 Fauna of West Bengal ZSI. Part II.* p. 355.

Material examined : Sexs; Saegakatte, 15-iii-2003, S. Krishnan.

Distribution : Punjab, West Bengal.

3(a). *Brachionus calyciflorus* f. *anuraeformis* (Brehm, 1909)

1909. *Brachionus pela anuraeformis* Brehm. *Arch. Hydrobiol.*, **4** : 210.

1998. *Brachionus calyciflorus* f. *anuraeformis* (Brehm). *Fauna of West Bengal, State Fauna Series*, **3**(Part-11) : 356-358.

Material examined : Sexs; Dhoddanikere, 15-iii-2003, S. Krishnan; Sexs; Jobkhanalle, 16-iii-2003, S. Krishnan.

Distribution : Madhya Pradesh, Orissa, Punjab, West Bengal.

3(b). *Brachionus calyciflorus* f. *borgerti* (Apstein, 1907)

1907. *Brachionus ampiceros borgerti* Apstein. *Zool. Abst. Syst.*, **25** : 201-244.

1998. *Brachionus calyciflorus* f. *borgerti* (Apstein, 1907). *Fauna of West Bengal, State Fauna Series*, **3**(Part-11) : 358.

Material examined : Sexs; Bannerghatta Rest House, 31-vii-2002, S. Krishnan; Sexs; Dhoddanikere, 15-iii-2003, S. Krishnan; Sexs; Jobkhanalle, 16-iii-2003, S. Krishnan.

Distribution : Andhra Pradesh, Orissa, Punjab, West Bengal.

3(c). *Brachionus calyciflorus* f. *dorcas* (Gosse, 1851)

1851. *Brachionus calyciflorus* var. *dorcas* Gosse. *Ann. Mag. Nat. Hist. Ser.*, **2**, **8** : 197-203.

2000. *Brachionus calyciflorus* var. *dorcas* Gosse, 1851. Dhanapathi. *Rotifer Taxonomy. IAAB. Hyderabad* : 40.

Material examined : 5 exs; Dhoddanikere, 15-iii-2003, S. Krishnan; 5 exs; Saegakatte 15-iii-2003, S. Krishnan.

Distribution : Andhra Pradesh, Orissa, Madhya Pradesh, Punjab, West Bengal.

3(d). ***Brachionus calyciflorus* var. *hymani*** Dhanapathi, 1974.

1974. *Brachionus calyciflorus* var. *hymani* Dhanapathi. *Hydrobiologia*, **45** : 357-372.

2000. *Brachionus calyciflorus* var. *hymani* Dhanapathi. *Rotifer Taxonomy. IAAB. Hyderabad* : 40.

Material examined : 5exs; Hutchinagunta, 2-vii-2002, M. B. Raghunathan.

Distribution : Andhra Pradesh.

4. ***Brachionus caudatus personatus*** (Ahlstrom, 1940)

1940. *Brachionus caudatus* var. *personatus* (Ahlstrom). *Bull. Amer. Mus. Nat. Hist.* **77**: p. 158.

1998. *Brachionus caudatus* var. *personatus* (Ahlstrom). *Fauna of West Bengal, State Fauna Series*, **3(Part-11)** : 359.

Material examined : 5 exs; Singhagatta, 29-iv-2002, 5 exs; Saegakatte, 15-iii-2003, S. Krishnan; 5 exs; Jobkhanalle, 16-iii-2003, S. Krishnan.

Distribution : Orissa, Punjab, West Bengal.

5. ***Brachionus diversicornis*** (Daday, 1883)

1883. *Schizocerca diversicornis* Daday. *Math. Termesz 'Ertesito. Budapest*, **1** : 291.

1998. *Brachionus diversicornis* (Daday). *Fauna of West Bengal, State Fauna Series*, **3(Part-11)** : 359.

Material examined : 5 exs; Saegakatte, 15-iii-2003, S. Krishnan; 5 exs; Dhoddanikere, 15-iii-2003, S. Krishnan; 5 exs; Jobkhanalle, 16-iii-2003, S. Krishnan.

Distribution : Assam, Orissa, Punjab, West Bengal.

6. ***Brachionus durgae*** Dhanapathi, 1974.

1974. *Brachionus durgae* Dhanapathi. *Hydrobiologia*, **45**: 357-372.

1995. *Brachionus durgae* Dhanapathi. *J. Aqua. Biol.*, **10(1&2)** : 48-52.

Material examined : 5 exs; Hutchinagunte, 5-viii-2002; 5 exs; Dhoddanikere, 15-iii-2003, S. Krishnan.

Distribution : Andhra Pradesh, Kerala.

7. *Brachionus falcatus* Zacharias, 1893

1898. *Brachionus falcatus* Zacharias. *Forschunster. Biol. Stn. Zu. Plon.*, 6 : 89-139.

1998. *Brachionus falcatus* Zacharias. *Fauna of West Bengal, State Fauna Series*, 3(Part-11) : 361.

Material examined : 5 exs; Dhoddanikere, 15-iii-2003, S. Krishnan; 5 exs; Saegakatte, 15-iii-2003, S. Krishnan; 5 exs; Jobkhanalle, 16-iii-2003, S. Krishnan.

Distribution : Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Madhyapradesh, Orissa, Punjab, Rajasthan, West Bengal.

8(a). *Brachionus forficula forficula* Wierzejski, 1891

1891. *Brachionus forficula* Wierzejski. *Bull. Soc. Zool. France*, 16 : 51.

1998. *Brachionus forficula forficula* Wierzejski. *Fauna of West Bengal, State Fauna Series*, 3(Part-11) : 361-362.

Material examined : 5 exs; Jobkhanalle, 16-iii-2003, S. Krishnan.

Distribution : Andhra Pradesh, Gujarat, Orissa, West Bengal.

8(b). *Brachionus forficula minor* (Voronkov, 1913)

1913. *Brachionus forficula var. minor* Voronkov. *Arb. Hydrobiol. State. Glubokom. Ser.*, 5 : 103.

1998. *Brachionus forficula minor* (Voronkov). *Fauna of West Bengal, State Fauna Series*, 3(Part-11) : 362.

Material examined : 5 exs; Saegakatte, 15-iii-2003, S. Krishnan; 5 exs; Jobkhanalle, 16-iii-2003, S. Krishnan.

Distribution : Orissa, Punjab, West Bengal.

9. *Brachionus plicatilis* O. F. Muller, 1786.

1786. *Brachionus plicatilis* O. F. Muller. *Havinae*: ILVI; 344.

1998. *Brachionus plicatilis* O. F. Muller. *Fauna of West Bengal, State Fauna Series*, 3(Part-11) : 363.

Material examined : 5 exs; Saegakatte, 15-iii-2003, S. Krishnan; 5 exs; Doddanikere, 15-iii-2003, S. Krishnan.

Distribution : Assam, Ladak, Punjab, Rajasthan, West Bengal.

10. *Brachionus rubens* Ehrenberg, 1838

1838. *Brachionus rubens* Ehrenberg. *Ein Blick indas tiefere Organische Leben der Natur. Laipzig.*, 1-xviii: 513.

1998. *Brachionus rubens* Ehrenberg. *Fauna of West Bengal, State Fauna Series*, 3(Part-11) : 365.

Material examined : 5 exs; Saegakatte, 15-iii-2003, S. Krishnan; 5 exs; Bannerghatta Rest House, 31-8-2002, S. Krishnan; 5 exs; Doddanikere, 15-iii-2003, S. Krishnan; 5 exs; Jobkhanalle, 16-iii-2003, S. Krishnan.

Distribution : Assam, Haryana, Orissa, Punjab, Rajasthan, West Bengal.

11. *Brachionus urceolaris* O. F. Muller, 1773

1773 *Brachionus urceolaris* O. F. Muller. *Havinae of Lipsiae. I. Infusoria.*, : 131.

1998 *Brachionus urceolaris* O. F. Muller. *Fauna of West Bengal, State Fauna Series*, 3(Part-11) : 367.

Material examined : 5 exs; Doddanikere, 15-iii-2003, S. Krishnan; 5 exs; Jobkhanalle, 16-iii-2003, S. Krishnan.

Distribution : Madhya Pradesh, Punjab, West Bengal.

12. *Keratella tropica* (Apstein, 1907)

1907. *Anurea Valga f. tropica* Apstein, *Zool. Jb. Abst Syst.*, 25 : 210.

1998. *Keratella tropica* (Apstein). *Fauna of West Bengal, State Fauna Series*, 3(Part-11) : 369-370.

Material examined : 5 exs; Singaghatta, 30-vi-2002, M. B. Raghunathan; Bannerghatta Rest House, 1-viii-20002, S. Krishnan; 5 exs; Saegakatte, 15-iii-2003, S. Krishnan; 5 exs; Doddanikere, 15-iii-2003, S. Krishnan; 5 exs; Jobkhanalle, 16-iii-2003, S. Krishnan.

Distribution : Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Kashmir, Kerala, Ladak, Madhya Pradesh, Orissa, Punjab, Rajasthan, West Bengal.

13. *Lecane (Monostyla) clasterocerca* (Schmarda, 1859)

1859. *Monostyla clasterocerca* Schmarda. *Veue Wibbellose Tier, beobachtet Und gesammelt and biner Reiesum die erde*. 1853-1857. Leipzig., 1 : 1-XVIII. 59.

1998. *Lecane (Monostyla) clasterocerca* (Schmarda). *Fauna of West Bengal, State Fauna Series*, 3(Part-11) : 412.

Material examined : 5 exs; Saegakatte, 15-iii-2003, S. Krishnan.

Distribution : Assam, Gujarat, Kashmir, Ladak, Rajasthan, West Bengal.

14. *Asplanchna brightwelli* Gosse, 1850

1850. *Asplanchna brightwelli* Gosse. *Ann. Mag. Nat. Hist. Ser.*, 2, 6 : 24.

1998. *Asplanchna brightwelli* Gosse. *Fauna of West Bengal, State Fauna Series*, 3(Part-11) : 428.

Material examined : Bannerghatta Rest House, 31-8-2002, S. Krishnan; 5 exs; Hutchinagunta, 5-viii-2002, S. Krishnan.

Distribution : Andhra Pradesh, Assam, Kashmir, Ladak, Orissa, Punjab, West Bengal.

15. *Asplanchna priodanta* Gosse, 1850

1850. *Asplanchna priodanta* Gosse. *Ann. Mag. Nat. Hist. Ser.*, 2, 6 : 18.

1998. *Asplanchna priodanta* Gosse. *Fauna of West Bengal, State Fauna Series*, 3(Part-11) : 428-429.

Material examined : 5exs; Doddanikere, 15-iii-2003, S. Krishnan.

Distribution : Gujarat, Kashmir, Meghalaya, West Bengal.

16. *Asplanchna bhimavaramensis* Dhanapathi, 1975.

1975. *Asplanchna bhimavaramensis* Dhanapathi. *Zool. J. Linn. Soc. (London)*. **57** : 85-94.

2000. *Asplanchna bhimavaramensis* Dhanapathi. *Rotifer Taxonomy. IAAB. Hyderabad* : 84.

Material examined : 5 exs; Bannerghatta Rest House, 31-8-2002, S. Krishnan; 5 exs; Jobkhanalle, 16-iii-2003, S. Krishnan.

Distribution : Andhra Pradesh.

17. *Conochilus unicornis* Rousselet, 1892

1892. *Conochilus unicornis* Rousselet. *J. Quekeff. Micros. Club. Ser.*, 2, 41 : 267-279.

1998. *Conochilus unicornis* Rousselet. *Fauna of West Bengal, State Fauna Series*, 3(Part-11) : 435-437.

Material examined : 5 exs; Saegakatte, 15-iii-2003, S. Krishnan.

Distribution : West Bengal.

18. *Horaella brehmi* Donner, 1949

1949. *Horaella brehmi* Donner. *Hydrobiologia*, 2 : 304-328.

1998. *Horaella brehmi* Donner. *Fauna of West Bengal, State Fauna Series*, 3(Part-11) : 444.

Material examined : 5 exs; Bannerghatta Rest House, 31-8-2002, S. Krishnan.

Distribution : Bihar, Orissa, West Bengal.

19. *Pompholyx sulcata* Hudson, 1885

1885. *Pompholyx sulcata* Hudson. *J. Roy. Microsei*, 613.

1998. *Pompholyx sulcata* Hudson. *Fauna of West Bengal, State Fauna Series*, 3(Part-11) : 438.

Material examined : 5 exs; Saegakatte, 15-iii-2003, S. Krishnan.

Distribution : Assam, Kashmir, Ladak, Orissa, Punjab, West Bengal.

SUMMARY

In the present study, 19 species, 7 forms and 1 variety of Rotifera belonging to 6 families are reported from Bannerghatta National Park. This study is the only investigation on the Rotifera of Bannerghatta National Park. Further the distributional records of all the species reported here indicate that these species have not been reported from Karnataka state earlier.

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CRUSTACEA : CLADOCERA

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INTRODUCTION

Brehm (1953) investigated the Cladocerans from Bijapur, Karnataka. Patil and Gouder (1982, 1985) and Raghunathan (1988) dealt with Cladocera of Karnataka. Sharma (1991) reported 39 species from Karnataka state. Recently Raghunathan (2006) investigated the Cladocera of Biligirirangaswamy Wildlife Sanctuary, Karnataka.

SYSTEMATIC LIST

Order CLADOCERA

Family SIDIDAE

Genus *Diaphanosoma* Fischer, 1850.

1. *Diaphanosoma sarsi* Richard, 1894

2. *Diaphanosoma excisum* Sars, 1885

Family DAPHNIIDAE

Genus *Ceriodaphnia* Dana, 1853

3. *Ceriodaphnia cornuta* Sars, 1885

4. *Ceriodaphnia quadrangula* (O. F. Muller, 1776)

Family MOINIDAE

Genus *Moina* Baird, 1850

5. *Moina micrura* Kurz, 1874

6. *Moina brachiata* (Jurine, 1820)

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Family BOSMINIDAE

Genus *Bosmina* Baird, 1845

- 7.
- Bosmina longirostris*
- (O. F. Muller, 1776)

Family MACROTHRICIDAE

Genus *Macrothrix* Baird, 1843

- 8.
- Macrothrix spinosa*
- King, 1853

Family CHYDORIDAE

Genus *Pleuroxus* Baird, 1843

- 9.
- Pleuroxus aduncus*
- (Jurine, 1820)

- 10.
- Pleuroxus similis*
- Vavra, 1900

Genus *Chydorus* Leach, 1816

- 11.
- Chydorus sphaericus*
- (O. F. Muller, 1776)

- 12.
- Chydorus barroisi*
- Richard, 1894

Genus *Alona* Baird, 1843

- 13.
- Alona quadrangularis*
- (O. F. Muller, 1776)

- 14.
- Alona guttata*
- Sars, 1862

- 15.
- Alona davidi punctata*
- (Daday, 1898)

- 16.
- Alona rectangula rectangula*
- Sars, 1862

Genus *Leydigia* Kurz, 1875

- 17.
- Leydigia acanthocercoides*
- (Fischer, 1854)

SYSTEMATIC ACCOUNT

1. *Diaphanosoma sarsi* Richard, 18941894. *Diaphanosoma sarsi* Richard. *Revue Biol. Nord. France*, 6 : 365.1988. *Diaphanosoma sarsi* Richard. *Fauna of India, Indian Cladocera* : 44-46.

Material examined : 5 exs, Singagatte, 29.iv.2002, Coll: M. B. Raghunathan; 5exs, Doddanakere, 2.viii.2002, Coll: S. Krishnan; 5exs, Hutchinagunta, 5.viii.2002, Coll: S. Krishnan; 5 exs, Seegakette, 15.iii.2003, Coll: S. Krishnan; 5 exs, Jobkhanalla, 16.iii.2003, Coll: S. Krishnan.

Distribution : Bihar, Meghalaya, Tamil Nadu, Uttarpradesh, West Bengal.

2. *Diaphanosoma excisum* Sars, 1885

1885. *Diaphanosoma excisum* Sars. *Norske. Vidensk. Selsk. Forhaundl. Christiania*, 7 : 13-18.

1988. *Diaphanosoma excisum* Sars. *Fauna of India, Indian Cladocera* : 46-48.

Material examined : 5 exs, Singagatte, 29.iv.2002, Coll: M. B. Raghunathan; 5 exs, Doddanakere, 2.viii.2002, Coll: S. Krishnan; 5 exs, Seegakette, 15.iii.2003, 5exs, Doddanakere, 15.iii.2003, Coll: S. Krishnan; 5 exs, Jobkhanalla, 16.iii.200, Coll: S. Krishnan.

Distribution : Assam, Bihar, Kerala, Rajasthan, Tamil Nadu, West Bengal.

3. *Ceriodaphnia cornuta* Sars, 1885

1885. *Ceriodaphnia cornuta* Sars. *Norske. Vidensk. Selsk. Forhaundl. Christiania*, 8 : 26-28.

1988. *Ceriodaphnia cornuta* Sars. *Fauna of India, Indian Cladocera* : 51-53.

Material examined : 5 exs, Bannerghatta Quarry pool, 29.iv.2002, Coll: M.B. Raghunathan; 5 exs, Doddanakere, 2.viii.2002, Coll: S. Krishnan; 5 exs, Hutchinagunta, 5.viii.2002, Coll: S. Krishnan; 5exs, Seegakette, 15.iii.2003, Coll: S. Krishnan; 5exs, Doddanakere, 15.iii.2003, Coll: S. Krishnan; 5exs, Jobkhanalla, 16.iii.2003, Coll: S. Krishnan.

Distribution : Bihar, Haryana, Karnataka, Kerala, Madhya Pradesh, Meghalaya, Punjab, Rajasthan, Tamil Nadu.

4. *Ceriodaphnia quadrangula* (O. F. Muller, 1776)

1785. *Daphnia quadrangular* O. F. Muller. *Lipsiae et. Havniae*, : 90.

1988. *Ceriodaphnia quadrangula* (O. F. Muller). *Fauna of India, Indian Cladocera* : 54-55.

Material examined : 5 exs, Doddanakere, 15.iii.2003, Coll: S. Krishnan; 5exs, Seegakette, 15.iii.2003, Coll: S. Krishnan; 5 exs, Jobkhanalla, 16.iii.2003, Coll: S. Krishnan.

Distribution : Kashmir, Ladakh, Tamil Nadu.

5. *Moina micrura* Kurz, 1874

1874. *Moina micrura* Kurz. *Sitzber. K. Acad. Wiss. Wein. Malh. Nat.*, 70 : 13-15.

1988. *Moina micrura* Kurz. *Fauna of India, Indian Cladocera* : 86-89.

Material examined : 5 exs, Singhaghatta, 30.iv.2002, Coll: M. B. Raghunathan; 5 exs, Hutchinagunta, 5.viii.2002, Coll: S. Krishnan.

Distribution : Bihar, Haryana, Kerala, Punjab, Rajasthan, Tamil Nadu.

6. *Moina brachiata* (Jurine, 1820)

1820. *Moina brachiata* Jurine. *Histoire. des Monocler, quise trouvent aux environs de Geneve. Paris, :* 131-132.

1988. *Moina brachiata* (Jurine). *Fauna of India, Indian Cladocera* : 92-93.

Material examined : 5 exs, Singhaghatta, 30.iv.2002, Coll: M.B. Raghunathan.

Distribution : Meghalaya, Kashmir, Rajasthan.

7. *Bosmina longirostris* (O. F. Muller, 1776)

1776. *Lynceus longirostris* O. F. Muller. *Havniae* : 76.

1988. *Bosmina longirostris* (O. F. Muller). *Fauna of India, Indian Cladocera* : 97-98.

Material examined : 5 exs, Doddanakere, 15.iii.2003, Coll: S. Krishnan; 5 exs, Seegakette, 15.iii.2003, Coll: S. Krishnan.

Distribution : Kashmir, Meghalaya, Tripura, West Bengal.

8. *Macrothrix spinosa* King, 1853

1853. *Macrothrix spinosa* King. *Pap. Proc. R. Soc. Van Diemens Land* 2: 256

1988. *Macrothrix spinosa* King. *Fauna of India, Indian Cladocera* : 102-104.

Material examined : 5 exs, Seegakette, 15.iii.2003, Coll: S. Krishnan.

Distribution : Rajasthan, Tamil Nadu.

9. *Pleuroxus aduncus* (Jurine, 1820)

1820. *Monoculus aduncus* Jurine. *Histoire des Monoclas. Quise trouvent aux environs de Geneve. Paris, :* 152-153.

1988. *Pleuroxus aduncus* (Jurine). *Fauna of India, Indian Cladocera* : 123-125.

Material examined : 5 exs, Seegakette, 15.iii.2003, Coll: S. Krishnan.

Distribution : Andhra Pradesh, Kashmir, Punjab, Rajasthan, West Bengal.

10. *Pleuroxus similis* Vavra, 1900

1900. *Pleuroxus similis* Vavra. *Hamburger Magalhaensische Sammelreise 2, Hamburg, :* 23-24.

1988. *Pleuroxus similis* Vavra. *Fauna of India, Indian Cladocera* : 127-130.

Material examined : 5 exs, Seegakette, 15.iii.2003, Coll: S. Krishnan.

Distribution : Kashmir, Meghalaya, West Bengal.

11. *Chydorus sphaericus* (O. F. Muller, 1776)

1776. *Lynceus sphaericus* O. F. Muller. *Havniae* : 119.

1988. *Chydorus sphaericus* (O. F. Muller). *Fauna of India, Indian Cladocera* : 139-142.

Material examined : 5 exs, Doddanakere, 2.viii.2002, Coll: S. Krishnan.

Distribution : Bihar, Kashmir, Ladakh, Meghalaya, Tamil Nadu, Tibet, West Bengal.

12. *Chydorus barroisi* Richard, 1894

1894. *Pleuroxus barroisi* Richard. *Revue. Biol. Nord. France*, 6 : 375-377.

1988. *Chydorus barroisi* Richard. *Fauna of India, Indian Cladocera* : 149-151.

Material examined : 5 exs, Seegakette, 15.iii.2003, Coll: S. Krishnan.

Distribution : Andhra Pradesh, Kerala, Gujarat, West Bengal, Tamil Nadu.

13. *Alona quadrangularis* (O. F. Muller, 1776)

1776. *Lynceus quadrangularis* O. F. Muller. *Havniae* : 72-73.

1988. *Alona quadrangularis* (O. F. Muller). *Fauna of India, Indian Cladocera* : 170.

Material examined : 5 exs, Singhaghatta, 30.iv.2002, Coll: M.B. Raghunathan.

Distribution : Assam, West Bengal, Tamilnadu, Kerala.

14. *Alona guttata* Sars, 1862

1862. *Alona guttata* Sars. *Forhandl. Vidensk. Salark. Christiania* : 287-289.

1988. *Alona guttata* Sars. *Fauna of India, Indian Cladocera* : 184-186.

Material examined : 5 exs, Seegakette, 15.iii.2003, Coll: S. Krishnan.

Distribution : Kashmir, Ladakh, Tamil Nadu.

15. *Alona davidi punctata* (Daday, 1898)

1898. *Alona punctata* Daday. *Terms. Fiezetek*, 21 : 39-40.

1988. *Alona davidi punctata* (Daday). *Fauna of India, Indian Cladocera* : 177.

Material examined : 5 exs, Seegakette, 15.iii.2003, Coll: S. Krishnan.

Distribution : Andhra Pradesh, Tamil Nadu, West Bengal.

16. *Alona rectangula rectangula* Sars, 1862

1862. *Alona rectangula* Sars. *Forhandl. Vidensk. Selsk. Christiania.* : 160.

1988. *Alona rectangula rectangula* Sars. *Fauna of India, Indian Cladocera* : 172-174.

Material examined : 5 exs, Seegakette, 15.iii.2003, Coll: S. Krishnan.

Distribution : Gujarat, Kashmir, Ladak, Meghalaya, Rajasthan, West Bengal.

17. *Leydigia acanthocercoides* (Fischer, 1854)

1854. *Leydigia acanthocercoides* Fischer. *Bull. Soc. Imp. Nat. Mose.*, 27 : 431-433.

1988. *Leydigia acanthocercoides* (Fischer). *Fauna of India, Indian Cladocera* : 200-202.

Material examined : 5 exs, Hutchinagunta, 5.viii.2002, Coll: S. Krishnan.

Distribution : Gujarat, Kashmir, Rajasthan, West Bengal.

SUMMARY

In the present study, 17 species belonging to 6 families under 9 genera are reported from Bannerghatta National Park. This forms the first study on the Cladocera of Bannerghatta National Park. Among the families, only Chydoridae is represented with maximum number of species (9). Certain rare species like *Ceriodaphnia quadrangula*, *Moina brachiata*, *Bosmina longirostris*, *Alona quadrangularis* and *Leydigia acanthocercoides* are also reported from Bannerghatta National Park.

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Sharma, B.K. 1991. Cladocera. *Animal Resources of India* : 205-223.

CRUSTACEA : COPEPODA

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INTRODUCTION

Very few freshwater copepods studies are available from Karnataka and these studies also are restricted to general observations on plankton. However, studies pertaining to copepod of marine waters by Ummerkuty (1968) and on the parasitic copepods by Srinivasachar and Sundarabai (1974) are available from Karnataka. With reference to Bannerghatta National Park, no previous study is available and this will be the first work on copepoda of the Park.

SYSTEMATIC LIST

Order CALANOIDA

- 1 *Heliodiaptomus viduus* (Gurney, 1916)
2. *Neodiaptomus intermedius* (Floßner, 1984)

Order CYCLOPOIDA

3. *Thermocyclops decipiens* (Kiefer, 1929)
4. *Mesocyclops aspericornis* (Daday, 19096)

SYSTEMATIC ACCOUNT

1. *Heliodiaptomus viduus* (Gurney, 1916)

1916. *Diaptomus viduus* (Gurney, 1916). *Proc. Zool. Soc. Lond.*, 1 : 338-339.

1994. *Heliodiaptomus viduus* (Gurney). Rangareddy. Guides to the Identification of the Micro invertebrates of the Continental Waters of the World, 5 : 7-9.

Material examined : 5 exs, 29.vi.2002, Singhagalla, S. Krishnan; 5exs, 29.iv.2002, Bannerghatta , 29.vi.2002, S. Krishnan; 5exs, 29.iv.2002, Bannerghatta Quarypool, 29.vi.2002, S. Krishnan; 5 exs, 15.iii.2003, Dhoddanikere, S. Krishnan.

Remarks : Rostrum with 2 strongly developed spire in females. Genital somite slightly asymmetrical. Caudal rami longer. In male right antennule with spine on each of segments 8 and 10 to 16.

Distribution : Common in Southern India. Commonly found in seasonal ponds.

2. *Neodiaptomus intermedius* Floßner, 1984

1984. *Neodiaptomus intermedius* Floßner. *Hydrobiologia*, **108** : 259-263.

1994. *Neodiaptomus intermedius* Floßner. Rangareddy. *Guides to the Identification of the Micro invertebrates of the Continental Waters of the World*, 5

Material examined : 5 exs, 29.vi.2002, Singhagalla, S. Krishnan; 5exs, 29.iv.2002, Bannerghatta, 29.vi.2002, S. Krishnan; 5exs, 29.iv.2002, Bannerghatta Quarypool, 29.vi.2002, S. Krishnan; 5 exs, 15.iii.2003, Dhoddanikere, S. Krishnan.

Remarks : Rostrum with 2 strong spines in females, caudal rami aymmetrical. Antennular extending beyond caudal setae by 1 or 2 sgments.

Distribution : Andhra Pradesh, Kerala, Tamil Nadu. New record to Karnataka.

3. *Thermocyclops decipiens* (Kiefer, 1929)

1929. *Cyclops decipiens* Kiefer. *Das Tierreichi Crustacea Copepoda II. Cyclopoida Gnathostoma* : 625.

2005. *Thermocyclops decipiens* (Kiefer). Sivakumar. Freshwater Fish and Prawn Larval rearing using indigenus live feed. Ph. D. Thesis. Madras University.

Material examined : 5 exs, 29.vi.2002, Singhagalla, S. Krishnan; 5exs, 29.iv.2002, Bannerghatta, 29.vi.2002, S. Krishnan; 5exs, 16.iii..2003, S. Krishnan.

Remarks : More abundant in stagnant waters. End of P4 more than three time as long as broad, inner apical thorn more than double as long as the outer one.

Distribution : Common in India.

4. *Mesocyclops aspericornis* (Daday, 1906)

1906. *Cyclops aspericornis* Daday. *Zool. Jb. Syst.* **24** : 175-206.

2002. *Mesocyclops aspericornis* (Daday). Zehra and Altaff. *J. Aqua. Biol.*, **17**(1) : 69-74.

Material examined : 5 exs, 29.vi.2002, Singhagalla, S. Krishnan; 5exs, 29.iv.2002, Bannerghatta, 29.vi.2002, S. Krishnan; 5exs, 16.iii..2003, S. Krishnan.

Remarks : Body slender, seminal receptacle hammer shaped, hands of hammer dilated and almost sac like, furca generally slightly elongated, antennule 17 segmented,

P1 to P4 with 3 segmented rami, P1 without setae on inner angle of basipodite, P5 terminal segment with apical setae and long spine inserted laterally.

Distribution : Common in India.

SUMMARY

In the present study, 2 species of Calanoid copepods and 2 species of cyclopoid copepods are recorded from Bannerghatta National Park. Among the Calanoid Copepods, *Neodiaptomus intermedius* is reported for the first time from Karnataka.

REFERENCES

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- Ummerkutty, A.N.P. 1968. Studies on the Crustacean fauna of the Mysore coast 2. Description of the Copepods *Donodes pnikkari* n. sp. with remarks on the systematic position of the genus *Donodes* Wilson. *Cruastaceana*, **15** : 298-307.

CRUSTACEA : FRESHWATER PRAWNS

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INTRODUCTION

Jalihal, Shakuntala Shenay and Sankolli (1984, 1988) have made significant contribution to the systematics, ecology and development of inland freshwater prawns of Karnataka. Anantharaman *et al.* (1978) reported the occurrence and distribution of freshwater prawn in and around Bangalore. The present paper deals with the freshwater prawns of Bannerghatta National Park.

SYSTEMATIC ACCOUNT

Phylum	ARTHROPODA
Subphylum	CRUSTACEA
Order	DECAPODA
Superfamily	ATYOIDEA De Haan, 1849
Family	ATYIDAE De Haan, 1849
Genus	<i>Caridina</i> H. Milne Edwards

Key to the species of *Caridina*

- 1 Rostrum always longer than antennular peduncle and subequal to the antennal scale 2
- Rostrum shorter than the antennular peduncle and antennal scale (Reaches only $\frac{1}{2}$ of the II to the $\frac{4}{5}$ th of the III segment of the antennular peduncle)..... *C. gurneyi*
2. Spines on the upper margin of the rostrum arranged compactly throughout the length of the rostrum without any gap *C. williamsoni*
- Spines on the upper margin of the rostrum arranged leaving a wide gap on the proximal half which is often interrupted by 1-6 intermediate spines *C. kunnathurensis*

1. *Caridina gurneyi* Jalihal *et al.*, 1984

1984. *Caridina gurneyi* Jalihal, *et al. Rec. zool. Surv. India. Occ. Paper No.*, **69** : 1-40
 1994. *Caridina gurneyi* Richard & Chandran. *J. Bombay nat. Hist. Soc.*, **91**(2) : 242-259
 1997. *Caridina gurneyi* Mariappan. Ph.D. Thesis. Unpublished. Madras University.

Material examined : 1♀ from Gaddhealla, 15.iii.2003, Coll: S. Krishnan; 1♂ and 2♀♀ from Moorleygundi, 15.iii.2003, Coll: S. Krishnan; 1♀ from Chickrahally, 16.iii.2003, Coll: S. Krishnan; 3♂♂ and 1♀ from Doddanekere, 17.iii.2004, Coll: K. Rema Devi; 1♂ and 2♀♀ from Gollahalliseleo, 20.iii.2004, Coll: K. Rema Devi.

Diagnostic characters : Rostrum straight, reaches $\frac{1}{2}$ of the II antennular peduncle to the end of the III antennular peduncle. Rostral formula 19-23/5-7 (4-7). The spines are arranged compactly both in the dorsal and ventral surface throughout the length of the rostrum except its tip. Carpus of the first cheliped with deep anterior excavation and is 1.83-2.37 times as long as its breadth. Carpus of the second cheliped without any excavation and 4 to 4.91 times as long as its breadth. Propodus of the third periopod 3.53 to 3.83 times as long as dactylus. Dactylus is 2.4 to 3.4 times as long as its breadth. Propodus of the fifth periopod 3.22 to 5.5 times as long as dactylus. Dactylus is 2.5 to 2.88 times as long as its breadth. First pleopod of male with a well developed appendix interna. No dorsal hump is observed on the 3rd abdominal segment. Exopod of the uropod with 14 to 20 spines.

Distribution : Karnataka, Tamil Nadu.

2. *Caridina kunnathurensis* Richard and Chandran, 1994

1994. *Caridina kunnathurensis* Richard & Chandran. *J. Bombay nat. Hist. Soc.*, **91**(2) : 242- 259.
 1997. *Caridina kunnathurensis* Mariappan. Ph.D. Thesis. Unpublished. Madras University.

Material examined : 165♂♂, 148♀♀ and 249 juveniles from Doddanekere, 17.iii.2004, Coll: K. Rema Devi.

Diagnostic characters : Rostrum slightly upturned distally, equal to or slightly longer than the antennal scale. Rostral formula 11-24+1-3/8-14 with 2-5 spines on the carapace. Dorsal margin of the rostrum with a distal gap which is often interrupted by 1-6 teeth. Carpus of the first cheliped with slight excavation and is 1.71 to 2.58 times as long as its breadth. Carpus of the second cheliped without any excavation and 5.2 to 5.3 times as long as its breadth. Propodus of the third periopod 3.78 to 5.25 times as long as dactylus. Dactylus is 2.86 to 3.75 times as long as its breadth. Propodus of the fifth periopod 3.25 to 3.75 times as long as dactylus. Dactylus is 4.0-4.77 times as long as its breadth. First pleopod of male with well developed appendix interna over reaching the endopod. Posterior margin of the telson with 4 to 5 pairs of plumose process. The exopod of the uropod with 8-11 movable spines.

Distribution : Tamil Nadu. New report to Karnataka.

Remarks This species is reported for the first time outside Tamilnadu from Karnataka.

3. *Caridina williamsoni* Jalihal *et al.*,

1947. *Caridina nilotica* var. *chouhani* Chopra and Tiwari. *Rec. Ind. Mus.*, **45** : 213-224

1984. *Caridina williamsoni* Jalihal *et al.*, *Rec. zool. Surv. India. Occ. Paper No.*, **69** : 1-40.

1997. *Caridina williamsoni* Mariappan. Ph. D. Thesis. Unpublished. Madras University.

Material examined : 2♂♂ from Moorleygundi, 15.iii.2003, Coll: S. Krishnan; 5♂♂ and 1♀ from Chickrahally, 16.iii.2003, Coll: S. Krishnan; 475♂♂, 679♀♀ and 225 juveniles from Doddanakere, 17.iii.2004, Coll: K. Rema Devi; 42♂♂ and 48♀♀ from Gollahalliseleo, 20.iii.2004, Coll: K. Rema Devi.

Diagnostic characters : Rostrum straight, equal to or slightly longer or shorter than the antennal scale. Rostral formula 27-47 / 5-14. In the dorsal margin of the rostrum spines are arranged throughout the length of the rostrum without any gap. In the ventral margin spines are arranged leaving ¼ of the distal end. Carpus of the first cheliped with slight anterior excavation and is 1.78 to 2.23 times as long as its breadth. Carpus of the second cheliped without any excavation and 4.0 to 4.5 times as long as its breadth. Propodus of the third periopod 3.67 to 4.0 times as long as dactylus and the dactylus is 3.0 to 4.0 times as long as its breadth. Fifth periopod with propodus 3.23 to 3.46 times as long as dactylus and dactylus 3.25 to 4.33 times as long as its breadth. First pleopod of male with a well developed appendix interna. A dorsal hump is observed on the 3rd abdominal segment. Exopod of the uropod with 9 to 15 spines.

Distribution : Karnataka, Orissa, Tamil Nadu.

Superfamily PALAEMONOIDEA Refinesque, 1815

Family PALAEMONIDAE Refinesque, 1815

Subfamily PALAEMONINAE Refinesque, 1815

Genus *Macrobrachium* Bate, 1868

Key to the species of *Macrobrachium*

1. Exopod of the uropod with accessory sub-apical spine 2
- Exopod of the uropod without accessory sub-apical spine 3
2. Chela of the second cheliped subequal to the 3/4th of the carpus *M. sankolli*

- Chela of the second cheliped distinctly longer than the $3/4^{\text{th}}$ of the carpus.....
..... *M. unikarnatacae*
- 3. Rostrum much longer than or equal to the antennal scale and with a wide gap in the distal part of the upper margin of the rostrum..... *M. lamarrei lamarrei*
- Rostrum as longer or slightly longer or shorter than antennal scale and without distal wide gap in the upper margin of the rostrum 4
- 4. Chela of the second cheliped of both male and female shorter than carpus and ischium shorter than merus *M. kistnense*
- Chela of the second cheliped of male distinctly shorter than carpus but the chela of the female subequal to the carpus. Ischium of both male and female second cheliped equal to the merus..... *M. tiwarii*

4. *Macrobrachium kistnense* (Tiwari, 1952)

1952. *Palaemon kistnensis* Partim Tiwari, *Ann. Mag. Nat. Hist.*, **5** : 28.

1988. *Macrobrachium kistnensis* Jalihal et al. In: *Rec. zool. Surv. India, Occ. Paper No.*, **112** : 11.

2001. *Macrobrachium kistnensis* Jayachandran. *Palaemonid Prawns Biodiversity, Taxonomy, Biology and Management. Oxford & IBH Publishing Co. Pvt. Ltd. Calcutta* : 126.

Material examined : 3♂♂ and 4♀♀ from Gaddhealla 15-iii-2003, Coll: S. Krishnan; 1♂ and 1♀ from Hoserkere, Near tank, Horahalli Range, Coll: K. Rema Devi; 1♂ from Muthayalamadugeo, 20-iii-2004, Coll: K. Rema Devi; 4♂♂ and 2♀♀ from Muninagaram, 22-iii-2004, Coll: K. Rema Devi.

Diagnostic characters : Rostrum always longer than antennular peduncle and slightly shorter than antennal scale. Rostral formula 5-9/3-4 (1to2). Carapace smooth and 1.0 to 1.4 times the length of the rostrum. Second cheliped simple and similar in both the sexes. Ischium is shorter than merus, carpus and chela but longer than finger and palm. Merus shorter than carpus (merus 0.7 to 0.75 times the length of the carpus). Chela shorter than carpus (chela 0.78 to 0.95 times the length of the carpus). Fingers shorter than palm (fingers 0.6 to 0.81 times of the length of the palm). 6th abdominal segment is 1.32 to 1.79 times of 5th abdominal segment in length. Telson is 1.2 to 1.5 times of the 6th abdominal segment in length. Exopod of the uropod lacks accessory sub apical spine.

Distribution : Karnataka, Maharashtra.

5. *Macrobrachium lamarrei lamarrei* (H. Milne Edwards., 1837)

1837. *Palaemon lamarrei* H. Milne Edwards. *Hist. Nat. Crustacea*, **II** : 397.

2001. *Macrobrachium lamarrei lamarrei*. Jayachandran. *Palaemonid Prawns Biodiversity, Taxonomy, Biology and Management. Oxford & IBH Publishing Co. Pvt. Ltd., Calcutta* : 128.

2004. *Macrobrachium lamarrei lamarrei* Roy et al., In : *Fauna of Manipur, State Fauna Series*, 10 : 119-123.

Materials examined: 56♂♂ and 112♀♀ from Doddanakere, 17-iii-2004, Coll: K. Rema Devi; 11♂♂ and 33♀♀ from Muninagaram, 22-iii-2004, Coll: K. Rema Devi.

Diagnostic characters : Rostrum longer than antennular peduncle and longer than or equal to the antennal scale. Rostral formula 4-7+1-2 / 4-9 (1-2). In the upper margin of the rostrum a proximal group of 4-7 tooth are widely separated from the distal 0-2 sub-terminal tooth. Carapace smooth and 0.75 to 1.0 times as long as the rostrum. The second cheliped is simple and similar in both the sexes. Fingers shorter than the palm (Finger/Palm=0.625-1.0). Chela nearly ½ of the carpus (Chela/Carpus= 0.55-0.57 in males and 0.55-0.67 in females). Merus longer than chela but shorter than carpus. Ischium slightly longer than chela and more or less equal to the merus. 6th abdominal segment is 1.5 to 2.27 times of 5th abdominal segment in length. Telson is 1.08 to 1.38 times of the 6th abdominal segment in length. Exopod of the uropod lacks accessory sub apical spine.

Distribution : Common in India.

Remarks : In their account on freshwater prawns of the genus *Macrobrachium* Bate, Jaliha et al. (1988) have mentioned that *Macrobrachium lamarrei lamarrei* (H. Milne Edwards, 1837) was not available in almost all water bodies in Bangalore. The present study reveals its rich occurrence in the Bannerghatta National Park located in Bangalore.

6. *Macrobrachium sankolli* Jaliha et Shenoy, 1988

1988 *Macrobrachium sankolli* Jaliha et Shenoy, In : *Rec. zool. Surv. India, Occ. Paper No.*, 112 : 11.

2001 *Macrobrachium sankolli*. Jayachandran. Palaemonid Prawns Biodiversity, Taxonomy, Biology and Management. Oxford & IBH Publishing Co. Pvt. Ltd. Calcutta : 162.

Materials examined : 136♂♂ and 114♀♀ from Village pond, 27-vi-2002, Coll: M.B.Raghunathan; 1♂ and 1♀ from Gaddhealla, 15-iii-2003, Coll: S.Krishnan; 3♂♂ and 11♀♀ from Mulegundi, 18-iii-2004, Coll: K. Rema Devi; 8♂♂ and 18♀♀ from Udigabande, 18-iii-2004, Coll: K. Rema Devi; 3♂♂ and 2♀♀ from Uchanakante, 18-iii-2004, Coll: K. Rema Devi.

Diagnostic characters : Rostrum always longer than the antennular peduncle and slightly shorter than or equal to or slightly longer than antennal scale. Rostral formula 4-8 / 3-4 (1-2). Carapace smooth and 0.87 to 1.25 times as long as rostrum. II cheliped simple and similar in both the sexes. Fingers 0.59 to 0.89 times as long as palm. Chela slightly shorter than, equal to or slightly longer than ¾th of the carpus. Carpus longer than merus and 9.4 to 12.86 times as long as its width. Merus longer than the ischium and subequal to the chela. 6th abdominal segment 1.25 to 2 times of the 5th abdominal

segment in length. Telson 1.18 to 1.5 times of the 6th abdominal segment in length. Exopod of the uropod with accessory sub apical spine.

Distribution : Karnataka, Kerala.

7. *Macrobrachium tiwarii* Jalihal et Shenoy, 1988

1988 *Macrobrachium tiwarii* Jalihal et Shenoy, In : *Rec. zool. Surv. India, Occ. Paper No.*, **112** : 27.

2001 *Macrobrachium tiwarii* Jayachandran. Palaemonid Prawns Biodiversity, Taxonomy, Biology and Management. *Oxford & IBH Publishing Co. Pvt. Ltd. Calcutta* : 171.

Materials examined: 2♂♂ and 3♀♀ from Udigabande, 18-iii-2004, Coll: K. Rema Devi.

Diagnostic characters : Rostrum always longer than antennular peduncle and slightly shorter than or equal to the antennal scale. Rostral formula 6-8/3-4 (1-2). Carapace 0.8 to 1.36 times of the rostrum. Though the second chelipeds of male and female look simple and similar shows slight variation in the length of various segments. Both in males and females fingers are slightly shorter than or equal to the palm, ishium is more or less equal to the merus. In males the carpus is longer than the chela (1.43 to 1.5 times) and the merus is much shorter than carpus but equal to propodus. In females carpus is more or less equal to chela and the merus is much shorter than carpus and propodus. 6th abdominal segment is 1.63 to 2 times of the 5th abdominal segment in length. Exopod of the uropod lacks accessory sub apical spine.

Distribution : Karnataka, Pondicherry.

8. *Macrobrachium unikarnatacae* Jalihal et Shenoy, 1988

1988. *Macrobrachium unikarnatacae* Jalihal al., *Rec. Zool. Surv. India, Occ. Paper* **112**: 21

2001. *Macrobrachium unikarnatacae* Palaemonid Prawns Biodiversity, Taxonomy, Biology and Management. *Oxford & IBH Publishing Co. Pvt. Ltd. Calcutta* : 174.

Materials examined: 4♀♀ from Mulegundi, 15-iii-2003, Coll: S.Krishnan; 1♂ from Mulegundi, 18-iii-2004, Coll: K. Rema Devi.

Diagnostic characters : Rostrum longer than the antennular peduncle, shorter than or equal to the antennal scale. Rostral formula 6-9/3-4 (mostly 1 occasionally 2). Carapace smooth and 1.1 to 1.6 times longer than rostrum. II cheliped is simple and similar in both male and female. Fingers 0.72 to 0.92 times as long as palm. Chela distinctly longer than 3/4th of the carpus. Carpus longer than the merus and 7.9 to 11.17 times as long as its distal diameter. 6th abdominal segment 1.321 to 1.83 times of the 5th abdominal segment in length. Telson 1.18 to 1.36 times as long as 6th abdominal segment. Exopod of the uropod with accessory sub apical spine.

Distribution : Karnataka.

SUMMARY

During the present study eight species of prawns belonging two genera and two families are recorded from Bannerghatta National Park. It is quite remarkable to note the occurrence of *Caridina kunnathurensis* Richard & Chandran, 1994, for the first time out side Tamilnadu from Bannerghatta National park. Another important finding is *Macrobrachium lamarrei lamarrei* (H. Milne Edwards, 1837), which was considered as almost extinct in Bangalore by Jalihal *et al.*, (1988) is collected in good numbers during the present study from Bannerghatta National Park.

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CRUSTACEA : BRACHYURA : CRABS

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INTRODUCTION

The present work is an attempt to work out the faunal wealth of fresh water crabs from the Bannerghatta National Park, Karnataka. The study is based on the material collected (Table-I) during the different seasons spread over the period of two years.

The earliest record from Karnataka, India made available by Alcock (1910) followed by Bott (1970) who revised several species of Alcock (1910) and elevated them to the generic level. As a result, five species have so far been recorded from Karnataka state. The material so far collected is represented by seven species under five genera and two families (Table-I). None of them are new to science but all the species are new records to the area under study. The Indian species of fresh water crabs have been accommodated under the super family Gecarcinucoidea. The classification of Bott (1970) is followed in this account. Abbreviations used are CL = Carapace length and CW = Carapace width; all measurements are in millimeters.

SYSTEMATIC LIST

Order DECAPODA

Infraorder BRACHYURA

Family GECARCINUCIDAE

1. *Barytelphusa (Barytelphusa) cunicularis* (Westwood, 1836)
2. *Barytelphusa (Barytelphusa) guerini* (Milne-Edwards, 1853)
3. *Gubernatoriana gubernatoris* (Alcock, 1909)
4. *Travancoriana pollicaris* (Alcock, 1909)
5. *Travancoriana schirnerae* Bott 1969

Family PARATHELPHUSIDAE

6. *Spiralothelphusa hydrodroma* (Herbst, 1794)
7. *Oziotelphusa senex senex* (Fabricius, 1798)

SYSTEMATIC ACCOUNT

1. *Barytelphusa (Barytelphusa) cunicularis* (Westwood, 1836)

1836. *Thelphusa cunicularis* Westwood, in Sykes & Westwood, *Trans. Entom. Soc. London*, **1** : 183, T. 19.
1910. *Paratelphusa (Barytelphusa) jacquemontii* Alcock, *Cat. Ind. Decap. Crust. Ind. Mus.*, **1**(2) : 79 fig. 55.
1910. *Paratelphusa (Barytelphusa) pulvinata* Alcock, *Cat. Ind. Decap. Crust. Ind. Mus.*, **1**(2) : 86, fig. 21.
1970. *Barytelphusa (Barytelphusa) cunicularis* Bott, *Abh. Senckenb. Natur. Ges. No.*, **526** : 31.

Material Examined 1♂ (CL 52.0mm., CW 79.0 mm.) 3♀ (CL 46.2-61.5 mm., CW 64.3-84.2 mm.), Athikupae halli, 17.ix.2003, G. Thirumalai; 4♀ (CL 24.3-31.0 mm., CW 34.3-41.3 mm.), Muthyala, 15.ix.2003, G. Thirumalai; 10♂ (CL 10.8 mm., CW 13.8-26.8 mm.), 4♀ (CL 15.1-25.6 mm., CW 20.8-35.8 mm.), Doddannakar, 17.iii.2004, K. Rema Devi; 7♂ (CL 36.4-50.0 mm., CW 48.4-70.0 mm.), 3♀ (CL 21.5-54.0 mm., CW 30.0-76.0 mm.), Udigebande, 18.iii.2004, K. Rema Devi; 1♂ (CL 20.5 mm., CW 27.5 mm.), Madeshpura Koil Kere, 19.iii.2004, K. Rema Devi; 2♂ (CL 15.8-18.2 mm., CW 20.5-24.8 mm.), 1♀ (CL 24.2 mm., CW 32.2 mm.), Gubamadugo, 20.iii.2004, K. Rema Devi.

Distribution : India : Andhra Pradesh, Bihar, Karnataka, Kerala, Maharashtra, Tamil Nadu, Uttar Pradesh, West Bengal (Burger).

Elsewhere : Sri Lanka (Doflein).

Remarks : This species is being recorded for the first time from the area under study.

2. *Barytelphusa (Barytelphusa) guerini* (Milne-Edwards 1853)

1853. *Thelphusa guerini* Milne-Edwards, *Ann. Sci. Nat. Zool.*, **20**(3) : 210
1910. *Paratelphusa (Barytelphusa) guerini* Alcock, *Cat. Ind. Decap. Crust. Ind. Mus.*, **1**(2) : 87, fig. 57.
1970. *Barytelphusa (Barytelphusa) guerini* Bott., *Abh. Senckenb. Natur. Ges. No.*, **526** : 33.

Material Examined: 4♂ (CL 15.8-32.4 mm., CW 22.2-45.5 mm.), Ebeta, 14.ix.2003, G. Thirumalai; 2♂ (CL 41.5-43.5 mm., CW 56.7-58.4 mm.), Athikupae halli, 17.ix.2003, G. Thirumalai; 3♀ (CL 15.1-25.1 mm., CW 20.8-34.1 mm.), Doddannakar, 17.iii.2003, K. Rema Devi; 1♀ (CL 23.8 mm., CW 30.0 mm.), Gubamadugo, 20.iii.2004, K. Rema Devi; 2♀ (CL 15.4-15.8 mm., CW 20.8-21.4 mm.), Muninagaram, 22.iii.2004, K. Rema Devi.

Distribution : India : Assam, Karnataka, Madhya Pradesh, Maharashtra, Tamil Nadu.

Remarks : This species is being recorded for the first time from the area under study.

3. *Gubernatoriana gubernatoris* (Alcock 1909)

1910. *Paratelphusa (Globitelphusa) gubernatoris* Alcock, *Cat. Ind. Decap. Crust. Ind. Mus.*, 1(2) : 117, fig. 32.

1970. *Gubernatoriana gubernatoris* Bott, *Abh. Senckenb Natur. Ges. No. 526* : 44.

Material Examined : 1♂ (CL 21.2 mm., CW 35.8 mm), Doddannakar, 7.iii.2004, K. Rema Devi.

Distribution : India : Kerala (Kochi), Maharashtra (Mahabaleshwar), Karnataka.

Remarks : This species is being recorded for the first time from the Karnataka state.

4. *Travancoriana pollicaris* (Alcock 1909)

1909. *Paratelphusa (Barytelphusa) pollicaris* Alcock, *Rec. Indian Mus.*, 3 : 377

1970. *Travancoriana pollicaris* Bott, *Abh. Senckenb. Natur. Ges. No. 526* : 41

Material Examined : 1♂ (CL 23.6 mm., CW 30.7 mm.), Madeshpura Koil Kere, 19.iii.2004, K. Rema Devi.

Distribution : India : Western Ghats.

Remarks : This species is recorded for the first time from the Karnataka State and is apparently endemic to southern Region of India.

5. *Travancoriana schirnerae* Bott

1905. *Potamon (Potamonantes) cunicularis* Rathbun, *Nouv. Arch. Mus.*, (4)7 : 184, T.15. Fig. 10.

1910. *Paratelphusa (Barytelphusa) cunicularis* Alcock, *Cat. Ind. Decap. Crust. Ind. Mus.*, 1 (2) : 83; Fig. 56.

1970. *Travancoriana schirnerae* Bott, *Abh. Senckenb. Natur. Ges. No. 526* : 41

Material Examined : 2♂ (CL 29.4-42.5 mm., CW 40.0-58.5 mm.), 2♀ (CL 31.0-36.4 mm., CW 42.3-48.4 mm.), Gubamadugo, 20.iii.2004, K. Rema Devi; 2♂ (CL 15.0-20.0 mm., CW 16.0-20.8 mm.), Muninagaram, 20.iii.2004, K. Rema Devi.

Distribution : India : Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Maharashtra (Poona to Baroda).

Remarks : Predominantly distributed throughout Kerala and Karnataka state.

6. *Spiralothelphusa hydrodroma* (Herbst 1794)

1794. *Cancer hydrodromus* Herbst, *Naturgesch. Krabben und Krebse*, 2 : 164, T.41 F.2..

1910. *Paratelphusa (Oziotelphusa) hydrodroma*, Alcock, *Cat. Ind., Decap. Crust. Ind. Mus.*, 1(2) : 97, fig. 60.

1970. *Spiralothelphusa hydrodroma* Bott., *Abh. Senckenb. Natur. Ges. No.*, 526 : 97.

Material Examined: 3♀ (CL 18.5–21.8 mm., CW 21.0–29.2 mm.), Judukonta, 16.iii.2004, K. Rema Devi.

Distribution : India : Karnataka, Kerala, Orissa, Pondicherry, Tamil Nadu, Uttar Pradesh, West Bengal.

Elsewhere : Sri Lanka.

Remarks : This species is being recorded for the first time from the area under study.

7. *Oziotelphusa senex senex* (Fabricius 1798)

1798. *Cancer senex* Fabricius. *Entom. syst.* (suppl. 340).

1910. *Paratelfusa (Oziotelphusa) bouvieri* Alcock, I *Cat. Ind. Decap. Crus. Ind. Mus.*, 1(2) : 100, Fig. 61.

Material Examined : 1♂ (CL 21 14 mm, CW 29.42 mm), 4♀ (CL 14.8 mm - 27.3 mm, CW 19.9 mm to 37.7 mm), Kayglahalli, 11.xi.2005, S. Prabhakaran: 4♂ (CL 13.7 mm to 22.5 mm, CW 19.0 mm to 31.3 mm), 10.xii.2005, S. Prabhakaran.

Distribution : India : Karnataka, Kerala (Calicut, Trivandrum, Vembanaad Lake) Orissa, Tamil Nadu, Uttar Pradesh (Allahabad), West Bengal.

Remarks : This species is widely distributed in Southern part of India.

Table-1

Sl. No.	Species	i	ii	iii	iv	v	vi	vii	viii	ix	x	xi
1	<i>Barytelphusa(Barytelphusa) cunicularis</i> (Westwood)	+		+		+			+	+		+
2	<i>B. (B) guerini</i> (Milne-Edwards)	+		+	+	+				+		
3	<i>Gubernatoriana gubernatoris</i> (Alcock)			+								
4	<i>Travancoriana pollicaris</i> (Alcock)								+			
5	<i>T. schirnerae</i> Bott					+					+	
6	<i>Spiralothelphusa hydrodroma</i> (Herbst)						+					
7	<i>Oziotelphusa senex senex</i> (Fabricius)		+					+				

Details of the localities (No. i to xi):

- | | |
|-------------------|---------------------------|
| i Athikupae halli | vi Judukonta |
| ii Bennarghata | vii Kayglahalli |
| iii Doddannakar | viii Madeshpura Koil Kere |
| iv Ebetta | ix Muthyala |
| v Gubamadugo | x Muninagaram |
| | xi Udigebande |

SUMMARY

The present account deals with seven species belonging to five genera under two families. All the seven species are reported for the first time from the area under study. Among these, two species, *Gubernatoriana gubernatoris* (Alcock) and *Travancoriana pollicaris*(Alcock) are recorded for the first time from the Karnataka state.

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INSECTA : ODONATA

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INTRODUCTION

The Odonata (Insecta), generally known as dragonflies and damselflies, are primitive, hemimetabolous insects, cosmopolitan in distribution. They are always found in the vicinity of waterbodies; the adults lead an aerial life while their nymphs are aquatic. All species of Odonata are predaceous, both in their nymphal and adult stages, and mainly prey upon insects including agricultural pests and vectors of diseases. Besides, the odonate nymphs are bioindicators enabling us to monitor the alterations or changes in the health of aquatic habitat systems, hence ecologically important.

Fraser (1933, 1934 & 1936) has dealt with the odonate fauna of the Karnataka state in India. However, pertaining to the Odonata of Karnataka, his study was mostly focused on those at the Coorg district. The present study comprising 11 exs. of Odonata deals with 3 species under 2 genera collected from the Bannerghatta National park of Karnataka, for the first time. Though odonates enjoy a wide distribution, the number of species collected from this park is very scanty. An intensive survey is imperative to yield more information on the odonates occurring in the park.

SYSTEMATIC LIST

Order ODONATA

Suborder ZYGOPTERA

Family COENAGRIONIDAE

1. *Agriocnemis pygmaea* (Rambur)

Suborder ANISOPTERA

Family LIBELLULIDAE

2. *Trithemis aurora* (Burmeister)

3. *Trithemis festiva* (Rambur)

SYSTEMATIC ACCOUNT

1 *Agriocnemis pygmaea* (Rambur)

Agrion pygmaeum Ramb., *Ins. Nevrop.* p. 278 (1842); Brauer, *Verh. zool.-bot. Ges. Wien*, Vol. Xiv, p. 161 (1864); id., *Reise, 'Novara'* p. 103 (1866).

Agriocnemis pygmaea Selys, *Syn. Agr. 5me Legion. Agrion* (suite fin), p. 52 (1877); Kirby, *Cat. Odon.* p. 158 (1890).

Material Examined : 1ex. (Male), Thattekere, 18-iii-2003; 1ex. (Female), Puttunekunde, 15-iii-2003, Coll: S. Krishnan.

Diagnosis : Small delicate insect, eyes black above, pale apple green on the sides and beneath; in male, labrum metallic blue; thorax black on dorsum, marked with narrow ante humeral apple-green stripes and laterally apple green; wings hyaline, pterostigma pale yellow in the fore wings, black in the hind wings; abdominal segments 1 to 6 pale greenish yellow with black markings and segments 7 to 10 brick red; females more robust than male, and exhibiting a number of polychromatic forms.

Habits and Habitat : Adults can be found resting on vegetation near ponds, streams and slow running water bodies.

Breeding : Breeds in temporary ponds, also in slow running marshy streams.

Distribution : Throughout the Oriental Region, Australia and Pacific Islands.

2. *Trithemis aurora* (Burmeister)

Libellula aurora Burmeister, *Handb. Ent.* Vol. ii, p. 859 (1839).

Trithemis aurora Brauer, *Verh. Zool.-bot. Ges. Wien.*, Vol. xviii, pp. 177, 735 (1868).

Material Examined : 3exs. (Males), Athikupaehalli, 17-ix-2003; 1ex. (Male), Muthyala-Maduvu, 15-ix-2003, Coll: G. Thirumalai.

Diagnosis : Male, crimson coloured; vesicle and upper surface of frons metallic violet; eyes crimson above, brown laterally, changing to lilaceous below; thorax and abdomen violaceous crimson with fine black markings on thorax; base of hind wing with a broad amber yellow spot, with darker brown rays in subcostal and cubital spaces; neuration crimson; in female, eyes purple brown above, lilaceous or grey below; frons yellow with a broad diffuse black basal line above; thorax pale olivaceous on sides, darker on dorsum with black markings as in the male; wings tipped with brown to as far as middle of pterostigma, reticulation bright yellow to brown, basal marking similar as in male, but pale and without dark rays in subcostal and cubital spaces; abdomen ochreous with black markings.

Habits and Habitat: A common dragonfly of the plains and submontane regions; adult males can be seen resting on vegetation near water bodies.

Breeding : Breeds in slow running streams and irrigation channels, rather than in ponds and tanks.

Distribution : Throughout India.

3. *Trithemis festiva* (Rambur)

Libellula festiva Rambur, *Ins. Nevrop.* p. 92 (1842).

Trithemis festiva Brauer, *verh. Zool.-bot. Ges. Wien.*, Vol. xviii, p. 736 (1868).

Material examined : 1ex. (Male), Ebella, 14-ix-2003; 4exs. (Males), Athikupae halli, 17- ix-2003, Coll: G. Thirumalai.

Diagnosis : In male, upper surface of frons and vesicle metallic violet; eyes dark brown above with purple reflex, bluish grey laterally and beneath; thorax and abdomen violaceous black; base of hind wing with a dark brown spot, subcostal and cubital spaces with dark rays, neuration black; abdomen black; in female, frons and vesicle non-metallic; eyes dark brown above, lilaceous below; thorax greenish-yellow or olivaceous; wings similar to male, but in adults broadly dark reddish-brown at apices; abdomen bright yellow, marked broadly with black.

Habits and Habitat : Always found near water, usually settling on rocks in mid-stream or on twigs overhanging water.

Breeding : Breeds in both still and running waters.

Distribution : Throughout India.

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- Fraser, F.C. 1934. *Fauna of British India, including Ceylon and Burma, Odonata*. Vol. 2 : 1+398. Publ.; Taylor & Francis, London.
- Fraser, F.C. 1936. *Fauna of British India, including Ceylon and Burma, Odonata*. Vol. 3 : 1+461. Publ.; Taylor & Francis, London.

INSECTA : MANTODEA

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INTRODUCTION

The present collection comprised of only nymphal stages for the mantids. However, they have been tentatively identified up to generic level. They represent two subfamilies under two families.

Identification of nymphs is not at all accepted by taxonomists, particularly in mantids. This is because they mostly mimic small ants and many vital characters for identification are missing at this stage.

SYSTEMATIC ACCOUNT

Family HYMENOPODIDAE
Subfamily ACROMANTINAE
Tribe **Acromantini**

***Hestiasula* sp.**

Material examined : 1 ex. nymph, Bannerghatta National Park, stn. II, lot No. 5, 23.03.2004, coll. K. Rema Devi.

Remarks : The peculiar coloration in this single nymph is worth mentioning. The entire body is uniformly brownish (dry specimen). The vertex protuberance is prominent. Frontal sclerite transverse with two carinae. In fore legs, coxae and femora uniformly brownish; there is no black mark of spot on inside of femora which appeared quite peculiar with respect to known Indian species.

Family MANTIDAE
Subfamily IRIDOPTERYGINAE
Tribe Iridopterygini

Hapalopeza sp.

Material examined : 3 ex. nymphs, Bannerghatta National Park, Harohalli Range, stn. No. III, lot No. 4, 22.03.2004, coll. K. Rema Devi.

Remarks : The examples are less than 5mm only in length. Whole body is dorsally shiny, sculptured by very fine granulations that appear to be in transverse line. Entire body is entirely jet black excepting the dorsal white line along the posterior edges of all thoracic segments. Frontal sclecite transverse, with two elongated tubercular structures at corners. The second antennal segment is four times longer than the rest and entirely black; the 1st and 3rd segments are less black; rest of the segments are pale brown. Pronotum laterally strongly constricted. In fore legs, 1st tarsal segment almost equal to rest of the segments together; femora with four external and 3 discoidal spines (two of them whitish and quite long like bristles); the basal two external spines are closer; with five long and four short internal spines of which basal two long ones do not have any short internal spine between them.

REFERENCES

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- Wood-Mason, J. 1891 A Catalogue of Mantodea in the collection of the Indian Museum. *Memoirs of Indian Museum*, **2** : 49-66. Calcutta.
- Mukherjee, T., Hazra, A.K. and Ghosh, A.K. 1995. The Mantid Fauna of India (Insecta : Mantodea). *Oriental Insects*, **29** : 185-358.

INSECTA : HEMIPTERA (Aquatic & Semi Aquatic Bugs)

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INTRODUCTION

This study is based on the collections made from the Bannerghatta National Park (BNP) which includes 26 species of Aquatic and Semi Aquatic bugs, accommodated under 17 genera under 6 families.

Key to the Families of aquatic and semi aquatic bugs of BNP

1. Antenna conspicuous and visible in dorsal view; inserted in front of eyes, & longer than head; lives on the surface of water, walking or skating; wingless and winged form 2
- Antenna hidden, not visible in dorsal view, very much shorter than head; lives in submerged water; always winged forms 3
2. Hind femora long, surpassing end of abdomen; middle legs inserted closer to hind legs than to front legs; head without a median groove or a line GERRIDAE
- Hind femora short, not surpassing end of abdomen; middle legs inserted almost midway between hind and front legs; head with a median groove or a line VELIIDAE
3. Rostrum short, triangular, not distinctly segmented; fore tarsi single segmented, Scoop like, fringed with setae CORIXIDAE
- Rostrum long, cylindrical, distinctly segmented; fore tarsi one or more segmented without setae 4
4. Oblong or elongate forms without abdominal appendages; hind tibia and tarsi ciliated; abdomen with a mid-ventral keel; swims upside down NOTONECTIDAE
- Fattened forms with or without abdominal appendages; swims normally with back towards the water surface 5

5. Tip of the abdomen with a long non retractile slender siphon NEPIDAE
 – Tip of the abdomen with a distinctive pair of flat retractile strap-like siphon
 BELOSTOMATIDAE

SYSTEMATIC LIST OF AQUATIC AND SEMI AQUATIC BUGS OF BNP

- | | | |
|----|---|--|
| | Infraorder | NEPOMORPHA |
| | Family | CORIXIDAE |
| | Subfamily | CORIXINAE |
| | Tribe | Agraptocorixini |
| | Genus | <i>Agraptocorixa</i> Kirkaldy |
| 1. | <i>Agraptocorixa</i> (A.) <i>hyalinipennis</i> | <i>hyalinipennis</i> (Fabricius) |
| | Tribe | Corixini |
| | Genus | <i>Sigara</i> Fabricius |
| | Subgenus | <i>Tropocorixa</i> Hutchinson |
| 2. | <i>Sigara</i> (T.) <i>pruthiana</i> | (Hutchinson) |
| | Subfamily | MICRONECTINAE |
| | Genus | <i>Micronecta</i> Kirkaldy |
| | Subgenus | <i>Basilonecta</i> Hutchinson |
| 3. | <i>Micronecta</i> (B.) <i>scutellaris scutellaris</i> | (Stål) |
| | Subgenus | <i>Dichaetonecta</i> Hutchinson |
| 4. | <i>Micronecta</i> (D.) <i>flavens</i> | Wróblewski |
| | Family | NOTONECTIDAE |
| | Subfamily | NOTONECTINAE |
| | Tribe | Notonectini |
| | Genus | <i>Enithares</i> Spinola |
| 5. | <i>Enithares fusca</i> | Brooks |
| | Subfamily | ANISOPINAE |
| | Genus | <i>Anisops</i> Spinola |
| 6. | <i>Anisops barbatus</i> | Brooks |
| 7. | <i>Anisops campbelli</i> | Brooks |
| 8. | <i>Anisops cavifrons</i> | Brooks |
| 9. | <i>Anisops niveus</i> | (Fabricius) |

10. *Anisops sardeus* Herrich–Shaffer

11. *Anisops waltirensis* Brooks

Family NEPIDAE
Subfamily NEPINAЕ
Tribe **Nepini**
Genus *Laccotrephes* Stål

12. *Laccotrephes griseus* (Guérin-Méneville)

Subfamily RANATRINAE
Tribe **Ranatrini**
Genus *Ranatra* Fabricius

13. *Ranatra elongata* Fabricius

14. *Ranatra filiformis* Fabricius

15. *Ranatra varipes varipes* Stål

Family BELOSTOMATIDAE
Subfamily BELOSTOMATINAE
Genus *Diplonychus* Laporte

16. *Diplonychus rusticus* (Fabricius)

Subfamily LETHOCERINAE
Genus *Lethocerus* Mayr
Subgenus *Lethocerus* Mayr

17 *Lethocerus (L.) indicus* (Lepeletier & Serville)

Infraorder GERROMORPHA
Family GERRIDAE
Subfamily CYLINDROSTETHINAE
Genus *Cylindrostethus* Mayr

18. *Cylindrostethus productus* (Spinola)

Subfamily GERRINAE
Genus *Aquarius* Schellenberg

19. *Aquarius adelaidis* (Dohrn)

Genus *Limnometra* Mayr

20. *Limnometra fluviorum* (Fabricius)

- Subfamily HALOBATINAE
Genus *Metrocoris* Mayr
21. *Metrocoris communis* (Distant)
- Subfamily PTILOMERINAE
Genus *Ptilomera* Amyot & Serville
Subgenus *Ptilomera* Amyot & Serville
22. *Ptilomera* (P.) *agroides* Schmidt
- Subfamily TREPOBATINAE
Genus *Lathriobates* Polhemus
23. *Lathriobates raja* (Distant)
- Genus *Naboandelus* Distant
24. *Naboandelus signatus* Distant
- Family VELIIDAE
Subfamily MICROVELIINAE
Genus *Microvelia* Westwood
Subgenus *Microvelia* Westwood
25. *Microvelia* (*Microvelia*) *diluta* Distant
- Subgenus *Picaultia* Andersen & Weir
26. *Microvelia* (*Picaultia*) *douglasi* Scott

SYSTEMATIC ACCOUNT

1. *Agraptocorixa hyalinipennis hyalinipennis* (Fabricius)

1803. *Sigara hyalinipennis* Fabricius, *Syst. Rhyn. Brusvigae*, 105.
1918. *Corixa unicolor* Paiva, *R  c. Indian Mus.*, 14 : 30.
1922. *Corixa paivana* Dover in Paiva & Dover, *Rec Indian Mus.*, 24 : 333.
1926. *Agraptocorixa hyalinipennis* (Fabricius): Jaczewski, *Ann. Zool. Mus. Polon. Warsaw*, 5 : 18
1940. *Agraptocorixa* (*Agraptocorixa*) *hyalinipennis* (Fabricius): Hutchinson, *Trans. Connecticut Acad. Art. Sci.*, 33 : 411.
2005. *Agraptocorixa hyalinipennis* (Fabricius): Thirumalai & Suresh Kumar. *Rec. zool. Surv. India*, 105 (1-2) : 8

Diagnosis : This species can be very easily recognized by its uniform hyaline brown coloration, unmarked elytra and pronotum. The abdominal sixth dorsum bearing the

strigil, produced backwards as a well-defined peduncle. *A. hyalinipennis* is the only species of the genus so far known from India and commonly found to inhabit the ditches, puddles and stagnant pools in various parts of the country including Eastern and Western Ghats.

Material Examined : 13♂ and 29♀ from Nachenkere, 22-iii-2004, Coll: K. Rema Devi; 1♂ and 4♀ from Pillvarathahalli, Coll: G. Thirumalai; 52♂, 28♀ and 4 immature from Boothanapalli, 22-iii-2004, Coll: K. Remadevi; 1♂ and 1♀ from Chickrahalli, 16-iii-2003, Coll: S. Krishnan; 1♂ from Horahalli range, Bettahalli Kavalu, 23-iii-2004, Coll: K. Rema Devi; 1♀ from Thallibande, 24-iii-2004, Coll: K. Rema Devi.

Distribution : India; Myanmar; New Guinea; Pakistan; Taiwan.

2. *Sigara pruthiana* (Hutchinson)

1940. *Corixa (Trpocorixa) pruthiana* Hutchinson, *Trans. Connecticut Acad. Art. Sci.*, **33** : 447.

1989. *Corixa (Trpocorixa) pruthiana* Hutchinson: Thirumalai, *Misc. Occ. Pap. Rec. zool. Surv. India*, **118** : 13.

2001. *Sigara (Trpocorixa) pruthiana* (Hutchinson): Thirumalai, *Fauna conservation area*, **11** : 114.

2004. *Sigara (Trpocorixa) pruthiana* (Hutchinson): Thirumalai, *Rec. zool. Surv. India*, **102** : 68.

Diagnosis : General colour pale yellow or brown and palae are parallel sided with pegs uniformly, closely placed. The right paramere of male with broad base, a central blunt process on the dorsal margin, a well marked subapical tubercle on the ventral margin and a broad elongate beak at the apex.

Material Examined : 1♂ and 1♀ from Chickrahalli, 16-iii-2003, Coll: S. Krishnan.

Distribution : India : Karnataka, Tamil Nadu, Uttar Pradesh.

3. *Micronecta scutellaris scutellaris* (Stål)

1858. *Sigra scutellaris* Stål *Vetens akad. Forh.*, **15** : 319.

1908. *Micronecta malabarica* Kirkaldy, *Canad. Ent.*, **40** : 209.

1910. *Micronecta dione* Distant, *Fauna Brit. India*, **5** : 348.

1910. *Micronecta proba* Distant, *Fauna Brit. India*, **5** : 348.

1940. *Micronecta. (Basilonecta) scutellaris scutellaris* (Stål) : Hutchinson, *Trans. Connecticut Acad. Art. Sci.*, **33** : 365.

1940. *Micronecta scutellaris pseudostriata* Hutchinson *Trans. Connecticut Acad. Art. Sci.*, **33** : 371.

2005. *Micronecta (Basilonecta) scutellaris scutellaris* (Stål) : Thirumalai & Sharma, *Zool. Surv. India, Fauna of Melghat Tiger Reserve Conservation Area Series*, **24** : 352.

2006. *Micronecta (Basilonecta) scutellaris scutellaris* (Stål) : Thirumalai & Suresh Kumar, *Zool. Surv. India. Fauna of Conservation Area series*, **27** : 72.

Diagnosis : This is a very widely distributed species in India and mostly found in stagnant pools, pond and ditches. It is the most common member and the largest species (2.8 to 3.1 mm) of the genus. It can be identified by club-shaped tip of the left paramere and grey or greyish brown pronotum of males.

Material Examined : 60♂, 67♀ and 30 immature from Amba Temple Tank, 11-ix-2003, Coll: G. Thirumalai.

Distribution : India; Africa (Central); China; Indonesia; Malayasia; Saudi Arabia; Sri Lanka; Vietnam.

4. *Micronecta flavens* Wróblewski

1960. *Micronecta flavens* Wróblewski, *Ann. zool. Polon. Warsaw*, **18** : 317.

1972. *Micronecta flavens* Wróblewski : Wróblewski, *Bull. Entomol. Pologne.*, **42** : 17

1999. *Micronecta (Dichaetonecta) flavens* Wróblewski : Thirumalai, *Zoos Print J.*, **1-10** : 133.

2001. *Micronecta (Dichaetonecta) flavens* Wróblewski : Thirumalai, *Fauna of Conservation Area*, **11** : 114.

Diagnosis : *M. flavens* can be identified by narrow metaxiphus which is parabolic in outline. However, the parameres are very distinct with right has its shaft swollen in the middle and apex while the tip of left paramere dilated and the right margin with wrinkles and barbs. This species is very common in Sri Lanka and the present report from this National park constitutes first report from Karnataka.

Material Examined : 15♂♂ and 17♀♀ from Ebella, Andergangvalail, 14.ix.2003, Coll: Thirumalai.

Distribution : India : Karnataka (Present Report); Tamil Nadu.

5. *Enithares fusca* Brooks

1948. *Enithares fusca* Brooks, *J. Kans. Ent.. Soc.*, **21** : 46.

1968. *Enithares fusca* Brooks : Lansbury, *Pacif. Insects*, **10** : 412.

2001. *Enithares fusca* Brooks : Thirumalai, *ZSI. Fauna Conservation Area*, **11** : 115.

2004. *Enithares fusca* Brooks : Thirumalai, *Rec. zool. Surv. India*, **102(1-2)** : 65

Diagnosis : Size more than 9.0 mm (9.1 to 9.45 mm); Similar to *E. ciliata* (Fabricius) in general and the presence of a large nodule on the inner surface of the mid-tibia distally separate *E. fusca* from *E. ciliata*.

Material Examined : 2♀ from Nachenkere, 22-iii-2004, Coll: K. Rema Devi.

Distribution : India : Karnataka, Kerala, Madhya Pradesh, Maharashtra, Tamil Nadu.

6. *Anisops barbatus* Brooks

1951. *Anisops barbata* Brooks, Kan. Univ. Sci. Bull., **34** : 387.
1994. *Anisops barbata* Brooks: Thirumalai, Rec. zool. Surv. India, Occ. Pap. No., **165** : 13
1995. *Anisops barbatus* Brooks: Polhemus et al. Cat. Heteroptera Palaearctic region, **1** : 64.
2004. *Anisops barbatus* Brooks: Thirumalai, Rec. zool. Surv. India, **102**(1-2) : 65.

Diagnosis : This species can be easily identified by its large size (over 8.1 mm). It has two tufts of hair on the facial tubercle, asymmetrical male parameres with left paramere showing moderate excavation. The female ovipositor shows a small lateral tooth-like setae near apex and teeth arranged in two longitudinal rows. This species is the largest species of *Anisops* so far reported from India and distributed from plains to the foothills of the Western Himalaya.

Material Examined : 204♂♂ and 211♀♀ from Uchanakente, 18-iii-2004, Coll: K. Rema Devi; 131♂♂ and 63♀♀ from Nachenkere, 22-iii-2004, Coll: K. Rema Devi; 42♂♂ and 18♀♀ from Chickrahalli, 16-iii-2003, Coll: S. Krishnan; 14♂♂ and 23♀♀ from Thallebande, 24-iii-2004, Coll: K. Rema Devi; 6♂♂ and 15♀♀ from Pillavarathahalli, 12-ix-2003, Coll: G. Thirumalai; 20♂♂ and 14♀♀ from Boothanapalli, 22-iii-2004, Coll: K. Rema Devi; 1♂ and 1♀ from Udigabande, 16-iii-2003, Coll: S. Krishnan.

Distribution : India; China; Indonesia; Malaya; Myanmar; Srilanka; Taiwan, Vietnam.

7. *Anisops campbelli* Brooks

1951. *Anisops campbelli* Brooks, Brooks, Kans univ. Sci. Bull., **34** : 322.
1964. *Anisops campbelli* Brooks: Lansbury, Ann. zool. Warszawa, **22** : 213.
2001. *Anisops campbelli* Brooks: Thirumalai, Fauna conservation Area, **11** : 117.
2004. *Anisops campbelli* Brooks: Thirumalai, Rec. zool. Surv. India, **102**(1-2) : 65

Diagnosis : The interocular space in male projects anteriorly into a very short cephalic horn. The parameres are asymmetrical with the left very deeply excavate on the posterior margin. The ovipositor with two rows of longitudinal teeth and seven tooth like lateral setae near apex. It is almost entirely confined to the Indian subcontinent.

Material Examined : 1♂ and 8♀♀ from Uchanakente, 18-iii-2004, Coll: K. Rema Devi; 13♂♂ and 35♀♀ from Nachenkere, 22-iii-2004, Coll: K. Rema Devi; 4♂♂ and 23♀♀ from Chickrahalli, 16-iii-2003, Coll: S. Krishnan ; 1♂ from Udigabande, 16-iii-2003, Coll: S. Krishnan; 1♂ and 1♀ from Pillavarathahalli, 12-ix-2003, Coll: G. Thirumalai.

Distribution : India; Myanmar.

8. *Anisops cavifrons* Brooks

1951. *Anisops cavifrons* Brooks, *Kans. Univ. Sci. Bull.*, 34 : 418;
 1994. *Anisops cavifrons* Brooks: Thirumalai, *Rec. zool. Surv. India, Occ. Pap. No.*, 165 : 16.
 2004. *Anisops cavifrons* Brooks: Thirumalai, *Rec. zool. Surv. India*, 102(1-2) : 65

Diagnosis : *A. cavifrons* can be distinguished by the presence of a procumbent spine on the fore tibia of male. In males the left paramere is moderately excavate and there are three closely arranged small setae near the base of tarsus. This species has been reported from both Western Ghats and Eastern Ghats and interestingly recorded from Cochin backwaters in Kerala.

Material Examined : 1♂ and 1♀ from Athikuppehalla, 17-ix-2003, Coll: G. Thirumalai; 10♂♂ and 13♀♀ from Chickrahalli, 16-iii-2003, Coll: S. Krishnan; 1♂ and 8♀♀ from Pillavarathahalli, 12-ix-2003, Coll: G. Thirumalai.

Distribution : India; Pakistan.

9. *Anisops nivea* (Fabricius)

1775. *Notonecta nivea* Fabricius, *Systema Entomologiae, Flensburgi et-Lipsiae*, 690
 1851. *Anisops niveus* (Fabricius): Fieber, *Abhandl. Konigl. bohm. Ges. Wiss.*, 7 : 484.
 1928. *Anisops niveus* (Fabricius): Dover, *J. Bombay nat. Hist. Soc.*, 32 : 615.
 1947. *Anisops (Anisops) nivea* (Fabricius): Hafiz & Pradhan, *Rec. Indian Mus.*, 45 : 353.
 1951. *Anisops nivea* (Fabricius): Brooks, *Kans. Univ. Sci. Bull.*, 34 : 373.
 2001. *Anisops nivea* (Fabricius): Thirumalai, *Fauna of Conservation Area*, 11 : 117.

Diagnosis : Size not more than 6.00mm; facial tubercle with a triangular excavation bordered on each side by a raised carina in males.

Material Examined : 19♂♂ and 39♀♀ from Nachenkere, 22-iii-2004, Coll: K. Rema Devi; 1♂ from Thallebande, 24-iii-2004, Coll: K. Rema Devi; 2♂♂ from Udigabande, 16-iii-2003, Coll: S. Krishnan.

Distribution : India; Sumatra.

10. *Anisops sardeus* Herrich-Shaffer

1850. *Anisops sardeus* Herrich-Shaffer, *Die wanzenartigen Insecten*, 9 : 41.
 1906. *Anisops sardeus* Herrich-Shaffer: Distant, *Fauna British India*, 3 : 45
 1918. *Anisops sardeus* Herrich-Shaffer: Pavia, *Rec. Indian Mus.*, 14 : 28
 1951. *Anisops sardeus* Herrich-Shaffer: Brooks, *Univ. Kans. Sci. Bull.*, 34 : 423.
 1989. *Anisops sardea* Herrich-Shaffer: Thirumalai, *Rec. zool. Surv. India, Occ. Pap. No.*, 118 : 26
 1995. *Anisops sardeus sardeus* Herrich-Shaffer : Polhemus, *Cat. Het. Palaerctic region*, 1 : 66.

2006. *Anisops sardea* Herrich-Shaffer : Thirumalai & Suresh Kumar, *Zool. Surv. India, Fauna of Conservation Area Series*, **27** : 64.

Diagnosis : This is a moderately larger species (more than 7.3mm) with the male having a cephalic projection, the two basal tibial setae of anterior legs in male spatulate and the left paramere deeply excavate. The ovipositor of female with the longitudinal teeth and lateral tooth-like setae. It has a wide distribution. It is known to occur in Mediterranean countries and Western Asia and widely distributed in Ethiopian, Oriental and southern Palaearctic regions.

Material Examined : 7♂♂ and 16♀♀ from Uchanakente, 18-iii-2004, Coll: K. Rema Devi; 130♂♂ and 62♀♀ from Nachenkere, 22-iii-2004, Coll: K. Rema Devi; 273♂♂ and 96♀♀ from Chickrahalli, 16-iii-2003, Coll: S. Krishnan ; 2♂ and 1♀ from Thallebande, 24-iii-2004, Coll: K. Rema Devi; 4♂♂ and 11♀♀ from Pillavarathahalli, 12-ix-2003, Coll: G. Thirumalai; 3♂♂ and 13♀♀ from Boothanapalli, 22-iii-2004, Coll: K. Rema Devi; 2♂♂ and 3♀♀ from Udigabande, 16-iii-2003, Coll: S. Krishnan ; 15♂♂ and 6♀♀ from Athikuppehalla, 17-ix-2003, Coll: G. Thirumalai.

Distribution : India; Afghanistan; Africa; Albania; Canary Islands; Myanmar; Syria; Turkey.

11. *Anisops waltirensis* Brooks

1951. *Anisops waltirensis* Brooks, *Univ. Kans. Sci. Bull.*, **34** : 457.

1994. *Anisops waltirensis* Brooks: Thirumalai, *Rec. zool. Surv. India, Occ. Pap. No.*, **165** : 19.

2002. *Anisops waltirensis* Brooks: Thirumalai Metha & Sharma, *Res. Bull. Panjab Univ.*, **52** : 156.

Diagnosis : The species has been known only from India. The diagnostic characters comprise of a much narrower synthlipsis, a median row of small setae on inner surface of anterior tarsi of males of rostral prong that is acuminate at the apex.

Material Examined : 4♂♂ and 2♀♀ from Nachenkere, 22-iii-2004, Coll: K. Rema Devi; 24♂♂ and 50♀♀ from Chickrahalli, 16-iii-2003, Coll: S. Krishnan; 2♂♂ from Udigabande, 16-iii-2003, Coll: S. Krishnan.

Distribution : India.

12. *Laccotrephes griseus* (Güérin-Méneville)

1844. *Nepa griseus* Güérin- Méneville, *Iconoogr. Regne. Anim. Ins.*, 352.

1910. *Laccotrephes griseus* (Güérin- Méneville): Distant, *Fauna British India*, **5** : 314;

1947. *Laccotrephes griseus* (Güérin- Méneville): Hafiz & Pradhan, *Rec. Indian Mus.*, **45** : 363.

2005. *Laccotrephes griseus* (Güérin- Méneville): Thirumalai & Suresh Kumar, *Rec. zool. Surv. India*, **105** : 11.

2006. *Laccotrephes griseus* (Güerin- Méneville): Thirumalai & Suresh Kumar, *Zool. Surv. India. Fauna of Conservation Area Series*, 27 : 69.

Diagnosis : This species can be identified by the presence of slightly hooked and symmetrical parameres, abdominal appendages shorter than the body, presence of an obtusely rounded tooth at the base of the anterior femora. This species is commonly found in Peninsular India. It is a very sluggish species often found under weeds or at the bottom of slow or stagnant waters.

Material Examined : 2♀♀ and 1 immature from Doddannakere, 17-iii-2004, Coll: K. Rema Devi.

Distribution : India; Malaysia; Myanmar; Seychelles; Sri Lanka; Thailand.

13. *Ranatra elongata* Fabricius

1790. *Ranatra elongata* Fabricius *Skrif. Nat. Selesk.*, 1 : 228.

1906. *Ranatra elongata* Fabricius : Distant, *Fauna Brit. India*, 3 : 18.

1947. *Ranatra elongata* Fabricius : Hafiz & Pradhan, *Rec. Indian Mus.*, 45 : 368.

1972. *Ranatra elongata* Fabricius : Lansbury, *Trans. R. ent. Soc. Lond.*, 124 : 306.

1994. *Ranatra elongata* Fabricius : Thirumalai, *Rec. zool. Surv. India, Occ. Pap. No.*, 165 : 22.

2001. *Ranatra elongata* Fabricius : Thirumalai, *Fauna conservation area*, 11 : 118.

2004. *Ranatra elongata* Fabricius : Thirumalai, *Rec. zool. Surv. India*, 102(1-2) : 66.

2006. *Ranatra elongata* Fabricius : Thirumalai & Suresh Kumar, *Zool. Surv. India Fauna of Conservation Area Series*, 27 : 67

Diagnosis : This genus is cosmopolitan in distribution and contains more than 120 species all over the world. It is reported to be feeding on tadpoles, nymph of mayflies and other aquatic hemipterans and during dry seasons, it is known to migrate in search of suitable areas. This species can be identified by the structure of the anterior femur, which is provided with a triangular tooth beyond the middle of its length, and the metasternal process, which is sub triangular, and centrally longitudinally foveately sulcate. The forecoxae are two-thirds the length of prothorax and anterior lobe of prothorax less than twice the length of posterior lobe. Large body size (40-60 mm) and the length of the respiratory siphon that is equal or longer than the body can also distinguish this species.

Material Examined : 37♂♂ and 41♀♀ from Thalebande, 24-iii-2004, 1B& from Horahalli Range, Batanalu, 23-iii-2004, Coll: K. Rema Devi; 48♂♂ and 39♀♀ from Gullattikere 22-iii-2004, Coll: K. Rema Devi; 15♂♂ and 14♀♀ and 1 immature from Wachenkere, 22-iii-2004, Coll: K. Rema Devi; 1♂ from Boothana Palli, 22-iii-2004, Coll: K. Rema Devi; 31♂♂ and 39♀♀ and 2 immature from Nelgavi, 21-iii-2004, Coll: K. Rema Devi; 1♂ and 2♀♀ from Madeshpura Koil Kere, 19-iii-2004, Coll: K.

Rema Devi; 5♂♂ and 10♀♀ from Mulegundi, 18-iii-2004, Coll: K. Rema Devi; Coll: G. Thirumalai; 1♂ and 2♀♀ from Uthigabande Dam Site, 18-iii-2004, Coll: K. Rema Devi; 2♂♂ from Pillavarathahalli, 12-ix-2003.

Distribution : India; Australia; Nepal; Sri Lanka.

14. *Ranatra filiformis* Fabricius

1790. *Ranatra filiformis* Fabricius, *Skrit. Nat. Selsk.*, 1 : 228.

1860. *Ranatra sordidula* Dohrn, *Stett. ent. Zeit.*, 21 : 409.

1906. *Ranatra filiformis* Fabricius: Distant, *Fauna British India*, 3 : 21.

1906. *Ranatra sordidula* Dohrn: Distant, *Fauna British India*, 3 : 22.

2001. *Ranatra filiformis* Fabricius: Thirumalai, ZSI, *Fauna of Conservation Area*, 11 : 118.

2006. *Ranatra filiformis* Fabricius : Thirumalai & Suresh Kumar, *Zool. Surv. India Fauna of Conservation Area Series*, 27 : 68.

Diagnosis : The males of this species can be identified by the absence of a tooth and presence of several small spines on the inner margins of distally hook shaped paramere and presence of wide interocular space. This species is smaller in size than *R. elongata*. This species is mostly found among vegetation, fringing the shallower parts of water, clinging to submerged vegetation and feeds on nymphs of dragonflies and mosquito pupae.

Material Examined : 3♂♂ and 1immature from Doddannakere, 17-iii-2004, Coll: K. Rema Devi; 1♀ from Uthigabande Dam Site, 18-iii-2004, Coll: K. Rema Devi; 1♂ from Madeshpura Koil Kere, 19-iii-2004, Coll: K. Rema Devi.

Distribution : India (Widely distributed); Nepal; Pakistan; Philippines; Sri Lanka.

15. *Ranatra varipes varipes* Stål

1861. *Ranatra varipes* Stål, *Ofvers. K. Vetensk. Akad. Forh.*, 18 : 203;

1972. *Ranatra varipes* Stål: Lansbury, *Trans. R. Ent. Soc. Lond.*, 124 : 316;

1998. *Ranatra varipes varipes* Stål: Nieser & Polhemus, *Amemboa*, 2 : 22.

Diagnosis : Small body size 20-33 mm; respiratory siphon shorter than body; fore femora are broad with irregular brown markings.

Material Examined : 1♂ from Doddannakere, 17-iii-2004, Coll: K. Rema Devi.

Distribution : India; Australia; Indonesia; Malayasia; Myanmar; Srilanka; Taiwan; Thailand.

16. *Diplonychus rusticus* (Fabricius)

1781. *Nepa rustica* Fabricius, *Species insectorum*, **2** : 333.
 1776. *Nepa plana* Sulzer, *abgek. Gesch. Insect*, 92.
 1863. *Appasus marginicollis* Dufour, *Ann. Soc. Ent. France*, **(4)3** : 393.
 1868. *Diplonychus rusticus* (Fab.): Mayr *Zoolog. Teil Wien*, 188.
 1871. *Diplonychus rusticum* (Fab): Mayr, *Verh. zool.-bot. Ges. Wien*, **21** : 437.
 1906. *Sphaerodema rusticum* (Fab.): Distant, *Fauna British India*, **3** : 36.
 1915. *Sphaerodema rustica* (Fab): Bergroth, *J. Bombay nat. Hist.*, **24** : 179.
 1947. *Diplonychus rusticum* (Fab): Hafiz & Pradhan, *Rec. Indian Mus.*, **45** : 374.
 1961. *Diplonychus rusticus* (Fab.): Lauck & Menke, *Ann. Entomol. Soc. Amer.*, **54** : 649.
 1980. *Diplonychus indicus* Venkatesan & Rao, *J. Bombay. nat. Hist. Soc.*, **77** : 299.
 2005. *Diplonychus rusticus* (Fab.): Thirumalai & Suresh Kumar, *Rec. zool. Surv. India*, **105** : 13.

Diagnosis : This species has a single segmented fore tarsus with small claw, pale lateral basal margins of pronotum and its head length is shorter than the width between the eyes. This species is commonly found in fishponds and voraciously feeds on fish fry, mosquito larvae and other aquatic organisms.

Material Examined : 23♂♂, 38♀♀ and 12 immature from Doddannakere, 17-iii-2004, Coll: K. Rema Devi; 1♀ and 23 immature from Doddannakere, 17-iii-2004, Coll: K. Rema Devi; 1♂ and 2♀♀ from Boothapalli, 22-iii-2004, Coll: K. Rema Devi.

Distribution : India; Australia; China; Indonesia; Japan; Malaysia; Myanmar; New Guinea; New Zealand; Sri Lanka; Thailand.

17. *Lethocerus (Lethocerus) indicus* (Lepeletier & Serville)

1825. *Belostoma indica* Lepeletier & Serville, *Encycl. Meth.*, **X** : 272
 1871. *Belostoma indicum* Lepeletier & Serville, Mayr, *Verh. zool.-bot. Ges. Wien*, **21** : 426.
 1901. *Amorgius indicus* Kirkaldy, *Entomologist*, **34** : 51.
 1906. *Belostoma indicum* (Lepeletier & Serville): Distant, *Fauna British India*, **3** : 38.
 1911. *Belostoma indica* Lepeletier & Serville: D'Abreu, *J. Bombay nat. Hist.*, **20** : 883.
 1927. *Lethocerus indicus* (Lep. & Serv.): Torre-Bueno *Bull. Brooklyn Entomol. Soc.*, **22** : 30
 2006. *Lethocerus indicus* (Lep. & Serv.): Thirumalai & Suresh Kumar, *Zool. Surv. India Zool. Surv. India. Fauna of Conservation Area series*, **27**: 66.

Diagnosis : The 'giant Indian water bug' large, elongate, dorsoventrally flattened brown aquatic bug; divergent yellow line on anterior lobe of pronotum broad; eyes twice as long as wide and elongate. Members of this genus are found in deeper water bodies such as pond, lakes, flooded paddy fields etc.

Material Examined : 1♂ from Gubamadugu, 20-iii-2004, Coll: K. Rema Devi; 2♂♂ from Udigabande, 18-iii-2004, Coll: K. Rema Devi; 1♂ and 1♀ from Doddannakere, 17-iii-2004, Coll: K. Rema Devi; 1♂ from Nelgavi 21-iii-2004, Coll: K. Rema Devi.

Distribution : India; China; Indonesia; Malaysia; Myanmar; Pakistan; Srilanka.

18. *Cylindrostethus productus* (Spinola)

1840. *Gerris productus* Spinola, .*Essai Sur less insectes hemipteres rhynchotes on heteropteres*, 64.

1903. *Cylindrostethus productus* (Spinola): Distant, . *Fauna British India*, 2 : 184.

1910. *Janias elegantulus* Distant, . *Ann. Mag. nat. Hist.*, 5(8) : 145.

1994. *Cylindrostethus productus* (Spinola): Polhemus, . *Bishop Mus. Occ. Pap.*, 38 : 10.

2002. *Cylindrostethus productus* (Spinola): Thirumalai, . *Rec. zool. Surv. India*, 100(1-2) : 58.

2006. *Cylindrostethus productus* (Spinola): Thirumalai & Suresh Kumar, *Zool. Surv. India, Fauna of Conservation Area series*, 27 : 73.

Diagnosis : This species is very large (more than 25 mm), elongate, dark, which can be recognised by its large connexival spines. *C. productus* is the only member of the genus so far known from India. This species has been found inhabiting smooth flowing mountain streams.

Material Examined : 1♂ (winged) from Muthyala maduvu, 15-ix-2003, Coll: G. Thirumalai.

Distribution : India; Sri Lanka.

19. *Aquarius adelaidis* (Dohrn)

1860. *Aquarius adelaidis* Dohrn, . *Stettin.ent.Ztg.* 21 : 408.

1896. *Gerris spinolae* Leth. & Ser., . *Cat. gen. Hemiptera*, 3 : 63.

1903. *Gerris spinolae* Leth. & Ser.: Distant, . *Fauna British India*, 2 : 180.

1990. *Aquarius adelaidis* (Dohrn): Andersen, *Steenstrupia*, 16(4) : 61.

2002. *Aquarius adelaidis* (Dohrn): Thirumalai, . *Rec. zool. Surv. India*, 100(1-2) : 60.

Diagnosis : The first antennal segment is the longest, the head, rostrum, pronotum and forelegs are black. The hind margin of pronotum is brownish yellow; forewing dark brown in macropterous forms with dark brownish veins; the hind margin of the 7th sternum with a large triangular impression in middle. This is one of the very common

species inhabiting the permanent waterbodies in India, with both macropterous and apterous forms. This species is found in all lentic habitats and also recorded from deep wells in Southern India.

Material Examined : 1♀ (winged) from Swarnamugi Beat (Ramasamy Pond), 13-ix-2003, Coll: G. Thirumalai.

Distribution : India (Widely distributed); Bangladesh; China; Indonesia; Myanmar; Nepal; Philippines; Sri Lanka; Thailand; Vietnam.

20. *Limnometra fluviorum* (Fabricius)

1798. *Cimex fluviorum* Fabricius, *Ent. Syst. Suppl.*, 543.

1903. *Gerris fluviorum* (Fabricius): Distant, *Fauna British India*, 2 : 177

1903. *Gerris armata* Spinola: Distant, *Fauna British India*, 2 : 180.

1958. *Limnometra fluviorum* (Fabricius): Hungerford & Matsuda, *Kans. Univ. Sci. Bull.*, 39 : 401;

1960. *Tenagogonus (Limnometra) fluviorum* (Fab.): Matsuda, *Kans. Univ. Sci. Bull.*, 41 : 206.

2002. *Limnometra fluviorum* (Fabricius): Thirumalai, *Rec. zool. Surv. India*, 100(1-2) : 63.

2006. *Limnometra fluviorum* (Fabricius): Thirumalai & Suresh Kumar, *Zool. Surv. India, Fauna of Conservation Area series*, 27 : 24.

Diagnosis : *L. fluviorum* can easily be identified by the presence of a spine –like projection on the dorsolateral rear margin of middle coxae. This is a very common species found throughout Southern India and also recorded from a wide variety of freshwater habits.

Material Examined : 2♂, 1♀ and 1 immature (winged) from Muthyala maduvu, 15-ix-2003, Coll: G. Thirumalai; 8 immature from Athikupae halla, 17-ix-2003, Coll: G. Thirumalai.

Distribution : India: Karnataka, Kerala, Maharashtra, Pondicherry, Tamil Nadu, West Bengal; Philippines; Sri Lanka.

21. *Metrocoris communis* (Distant)

1910. *Euodus communis* Distant, *Ann. Mag. nat. Hist.*, 5(8) : 151.

1929. *Metrocoris communis* (Distant): Esaki, *Ann. Mag. nat. Hist. Soc.*, 4(10) : 419.

1965. *Metrocoris communis* (Distant): Den Boer, *Zool. Verh. Leiden.*, 74 : 13.

1993. *Metrocoris communis* (Distant): Chen & Nieser, *Steenstrupia*, 19(2) : 49.

2002. *Metrocoris communis* (Distant): Thirumalai, *Rec. zool. Surv. India*, 100(1-2) : 65.

2006. *Metrocoris communis* (Distant): Thirumalai & Suresh Kumar, *Zool. Surv. India. Fauna of Conservation Area series*, 27 : 77.

Diagnosis : A small (4.5 to 5.8 mm) oval, black and yellow water strider with black marking on dorsal side of head and thorax. The pronotum of wingless forms with 'T' shaped black pattern and the winged form with a median black longitudinal stripe almost reaching tip with a pair of lateral black stripes on posterior lobe. The 7th ventral segment of female with a tuft of dark brown hairs on either side laterally. *M. communis* found abundant in still or smooth flowing shaded streams, where they stroke and glide across the surface.

Material Examined : 1♂ and 1 immature from Ebella, Andharakangavale, 14-ix-2003, Coll: G. Thirumalai; 4♂, 6♀ (apterous) and 15 immature from Muthyala maduvu, 15-ix-2003, Coll: G. Thirumalai; 1B& winged and 12 immature from Athikuppae halla, 17-ix-2003, Coll: G. Thirumalai.

Distribution : India; Afghanistan; Iran; Iraq; Oman.

22. *Ptilomera (Ptilomera) agroides* Schmidt

1926. *Ptilomera agroides* Schmidt, *Ent. Mitt.*, 15(1) : 63.

1903. *Ptilomera laticaudata* (Hardwicke): Distant, *Fauna Brit. India*, 2 : 185 (Fig. 133).

1926. *Ptilomera lachne* Schmidt, *Ent. Mitt.*, 15(1) : 64.

1960. *Ptilomera (Ptilomera) agroides* Schmidt: Matsuda, *Kans. Univ. Sci. Bull.*, 41(2) : 269.

2002. *Ptilomera (Ptilomera) agroides* Schmidt: Thirumalai, *Rec. zool. Surv. India*, 100(1-2) : 69.

2006. *Ptilomera (Ptilomera) agroides* Schmidt: Thirumalai & Suresh Kumar, *Zool. Surv. India Fauna of Conservation Area Series*, 27 : 77.

Diagnosis : The long dorsolateral projection of pygofer, which extends half its length beyond lateral wings of suranal plate as viewed from above, separates this species from all other known species. The distal half of middle femur bears a dense brush of long hairs. The connexival spine of female arising from beneath the connexival edge of the seventh abdominal segment near its base. This species is so far known only from Southern India.

Material Examined : 1♀ (Apterous) from Muthyala maduvu, 15-ix-2003, Coll: G. Thirumalai.

Distribution : India : Karnataka, Kerala, Maharashtra, Tamil Nadu.

23. *Lathriobates raja* (Distant)

1910. *Gerris raja* Distant, *Ann. Mag. nat. Hist.*, 5(8) : 142.

1929. *Cryptobatus raja* (Distant): Esaki, *Ann. Mag. nat. Hist.*, **4**(10) : 412.
 1995. *Cryptobatus raja* (Distant): Polhemus & Polhemus, *Ent. Scand.*, **26**(1) : 104.
 2002. *Cryptobatus raja* (Distant): Thirumalai, *Rec. zool. Surv. India*, **100** (1-2): 71.
 2004. *Lathriobates raja* (Distant): Polhemus, *J. N. Y. Entomol. Soc.*, **112** : 212.

Diagnosis : Ground colour yellowish to orange brown; mesosternum without dark streaks laterally; macropterous with long pronotum, broadly rounded posteriorly, with median and lateral broad stripes.

Material Examined : 1♂ (winged) from Athikupae halla, 17-ix-2003, Coll: G. Thirumalai.

Distribution : India; Sri Lanka.

24. *Naboandelus signatus* Distant

1910. *Naboandelus signatus* Distant, *Ann. Mag. Nat. Hist.*, **5** : 152;
 2002. *Naboandelus signatus* Distant: Thirumalai, *Rec. zool. Surv. India*, **100**(1-2) : 71.
 2006. *Naboandelus signatus* Distant : Thirumalai & Suresh Kumar, *Zool. Surv. India Fauna of Conservation Area Series*, **27**: 79.

Diagnosis : Body short and somewhat oval. Size of male (apterous) 1.9 to 2.1 mm; female (apterous) 2.1 to 2.4 mm; there is a large black spot surrounded by brownish area on dorsal side of the head; pronotum is with a median yellow spot. Second genital segment with lateral process prominent. This species has been reported from stagnant ponds and quite areas of riverine systems in S. India.

Material Examined : 1♂, 3♀ and 1 immature from Ebella, Andharkangavale, 14-ix-2003, Coll: G. Thirumalai.

Distribution : India.

25. *Microvelia (Microvelia) diluta* Distant

1909. *Microvelia diluta* Distant, *Ann. Mag. nat. Hist.*, **3**(8) : 500.
 1995. *Microvelia (Microvelia) diluta* Distant: Andersen, *Cat. Het. Palaearctic Region*, **1** : 87.
 1989. *Microvelia (M) diluta* Distant: Thirumalai, 1989. *Rec. zool. Surv. India, Occ. Pap. No.*, **118** : 52.

Diagnosis : This can be readily identified by the presence of tibial comb both in the anterior and middle tibiae in males. The parameres are very rudimentary.

Material Examined : 1♂ from Athikupae halla, 17-ix-2003, Coll: G. Thirumalai.

Distribution : India; Indonesia.

26. *Microvelia (Picaultia) douglasi* Scott

1874. *Microvelia douglasi* Scott, *Ann. Mag. nat. Hist.*, **14** : 448.
1903. *Microvelia repentina* Distant, *Fauna Brit. India*, **3** : 174.
1909. *M. kumaonensis* Distant, *Ann. Mag. nat. Hist.*, **3(8)** : 500
1995. *Microvelia (Microvelia) douglasi* Distant: Andersen, *Cat. Het. Palaearctic Region*, **1** : 87.
2002. *Microvelia (Microvelia) douglasi* Distant: Thirumalai, *Rec. zool. Surv. India*, **100(1-2)** : 73.
2003. *Microvelia (Picaultia) douglasi* Scott: Andersen and Weir. *Invertebrate Systematic*, **17** : 338.
2006. *Microvelia (Picaultia) douglasi* Scott : Thirumalai & Suresh Kumar, *Zool. Surv. India. Zool. Surv. India. Fauna of Conservation Area series*, **27** : 79.

Diagnosis : Fourth antennal segment longest in males, tibial comb present only in foretibia and the intermediate tibiae distinctly smaller than femora.

Material Examined : 4♂ (winged) and 4♀ from from Athikuppae halla, 17-ix-2003, Coll: G. Thirumalai; 1♀ and 35 immature from Udugebandae, 11-ix-2003, Coll: G. Thirumalai.

Distribution : India : (widely distributed); Indonesia; Japan, Sri Lanka.

SUMMARY

The present record of 26 species of water bugs belonging to 6 families constitutes the first report of this group from Bannerghatta National Park, even though some information on a few families of aquatic bugs is available from Karnataka state (Thirumalai, 2002; 2003; Thirumalai and Krishnan, 2000 and Thirumalai and Suresh Kumar, 2006). The present study documents from the Park, authentically, 9.2 % of aquatic bugs' diversity of India and 35.1 % known from Karnataka. Based on the study, it is inferred that more systematic sampling efforts would yield more species from this conservation area.

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Thirumalai, G and S. Krishnan, 2000. Diversity of Gerromorpha (Heteroptera: Hemiptera: Insecta) in the Western Ghats States of India. *Rec. zool. Surv. India*, **98(4)** : 59-77.
Thirumalai, G and Suresh Kumar, R. 2006. Insecta : Hemiptera (Aquatic and semi-Aqautic). *Fauna of Bilgiri Rangaswamy Wildlife Sanctuary, Conservation Area Series*, **27**: 59-82.

INSECTA : LEPIDOPTERA : RHOPALOCERA

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INTRODUCTION

More than 1500 species of butterflies (Rhopalocera: Lepidoptera: Insecta) are known from India. Of these, 315 species are known to occur in Karnataka (Gaonkar, 1996). The butterfly specimens from the Bannerghatta National Park made available for identification, on examination could be categorized into 12 species under 8 genera and 3 families. Based on the collection data, apparently, there is a dominance of danaine butterflies during the rainy season in June. A systematic account on the species recorded through the present study is presented below. The nomenclature followed here is after Wynter Blyth (1957) and Kunte (2000).

SYSTEMATIC LIST

Order LEPIDOPTERA
Suborder RHOPALOCERA
Family PAPILOINIDAE

1. *Papilio polytes* Linnaeus
2. *Papilio demoleus* Linnaeus
3. *Pachliopta hector* (Linnaeus)

Family PIERIDAE

4. *Catopsilia pomona* (Fabricius)
5. *Eurema hecabe* (Linnaeus)
6. *Eurema brigitta* (Cramer)

Family NYMPHALIDAE

7. *Euploea core* (Cramer)
8. *Euploea sylvestris* (Fabricius)
9. *Tirumala septentrionis* (Butler)

10. *Danaus chrysippus* (Linnaeus)

11. *Danaus genutia* Cramer

12. *Phalanta phalantha* Drury

SYSTEMATIC ACCOUNT

1. *Papilio polytes* Linnaeus - Common Mormon

Material examined : 1ex., Hatchinaginta, 29.vi.2002, Coll. M. B. Raghunathan; 1ex., Muthyala Maduva, 15.ix.2003, Coll. G. Thirumalai.

Remarks : The species is found throughout the Oriental Region. Many different forms of the species are known. The caterpillars of this butterfly feed exclusively on plants belonging to the family, Rutaceae.

2. *Papilio demoleus* Linnaeus - Lime Butterfly

Material examined : 1ex., Antharagangavallae, 14.ix.2003, Coll. G. Thirumalai.

Remarks : A widespread species found in South and Southeast Asia, and Australia. Their host plants belong to the Rutaceae family. They can sometimes cause severe damage to citrus plants in orchards.

3. *Pachliopta hector* (Linnaeus) - Crimson Rose

Material examined : 1ex., Athikupaehalli, 17.ix.2003, Coll. G. Thirumalai; 1ex., Muthyala Maduva, 15.ix.2003, Coll. G. Thirumalai; 1ex., Kuthalahalli, 16.ix.2003, Coll. G. Thirumalai.

Remarks : *Pachliopta hector* has a very large area of distribution in India, Sri Lanka and some parts of Myanmar. The host plants of this butterfly species are *Aristolochia indica* and *Thottea siliquosa* (Aristolochiaceae). This butterfly species is legally protected under Schedule-I of Indian wildlife (Protection) Act of 1972.

4. *Catopsilia pomona* (Fabricius) - Common Emigrant

Material examined : 5exs., Athikupaehalli, 17.ix.03, Coll. G. Thirumalai; 4exs., Antharagangavallae, 14.ix.03, Coll. G. Thirumalai; 4exs. Pilvarathahalli, 12.ix.03, Coll. G. Thirumalai.

Remarks : It is a fairly common butterfly species in India. Its distribution extends over all of South and Southeast Asia and Australia. Their caterpillars mainly feed on various species of *Cassia* (Caesalpinaceae).

5. *Eurema hecabe* (Linnaeus) - Common Grass Yellow

Material examined : 1ex., Athikupaehalli, 17.ix.03, Coll. G. Thirumalai; 2exs., Village Pond, 27.vi.02, Coll. M.B. Raghunathan; 1ex., Pilvarathahalli, 12.ix.03, Coll. G. Thirumalai.

Remarks : The species is found allover India and is fairly common in many places. It is a widespread species, occurring in the tropical and subtropical areas of Africa, Asia and Australia. Though a polyphagous species, it mainly feeds on leguminous plants belonging to the families, Mimosaceae, Caesalpinaceae and Fabaceae.

6. *Eurema brigitta* (Cramer) - Small Grass Yellow

Material examined 2exs., Village Pond, 27.vi.02, Coll. M.B. Raghunathan.

Remarks : A locally common species. The only known larval food plant is *Cassia kleinii* (Caesalpinaceae).

7. *Euploea core* (Cramer) - Common Crow

Material examined : 1ex., Athikupaehalli, 17.ix.03, Coll. G. Thirumalai; 1ex., Doddanakere, 29.vi.02, Coll. M.B. Raghunathan.

Remarks : This butterfly can be found in India, throughout Southeast Asia to Australia and New Guinea. A polyphagous species found attracted to many plants of the families, Apocynaceae, Asclepiadaceae and Moraceae.

8. *Euploea sylvester* (Fabricius) - Double-branded Crow

Material examined : 3exs., Singhagatta, 29.vi.02, Coll. M.B. Raghunathan; 1ex., Hatchinaginta, 29.vi.02, Coll. M.B. Raghunathan.

Remarks : The species is found in South India and Sri Lanka, closely associated with *Euploea core*. Large congregations of this species are often seen along with other Danaids during rainy seasons. The known larval food plants are *Ichnocarpus frutescens* (Apocynaceae) and *Ficus* spp. (Moraceae).

9. *Tirumala septentrionis* (Butler) - Dark Blue Tiger

Material examined : 25exs., Singhagatta, 29.vi.02, Coll. M.B. Raghunathan; 25exs., Hatchinaginta, 29.vi.02, Coll. M.B. Raghunathan; 17exs., Doddanakere, 29.vi.02, Coll. M.B. Raghunathan.

Remarks : The species is restricted to the denser and wetter forest areas of South and Southeast Asia, and Australia. It is a regular migrant species often found among the

congregations of danaine butterflies. Its host plants are *Vallaris heynei* (Apocynaceae) and *Wattakaka volubilis* (Asclepiadaceae)

10. *Danaus chrysippus* (Linnaeus) - Plain Tiger

Material examined : 1ex., Hatchinaginta, 29.vi.02, Coll. M.B. Raghunathan; 1ex., Thattekere, 18.iii.03., Coll. S. Krishnan.

Remarks : The Plain Tiger has a very extensive distribution, extending from the Canary Islands through Africa, Middle East, South and Southeast Asia to Australia and New Guinea. The host plants belong to the genus, *Calotropis* as well as other members in the Asclepiadaceae family.

11. *Danaus genutia* Cramer - Striped Tiger

Material examined : 1ex., Singhagatta, 29.vi.02, Coll. M.B. Raghunathan; 1ex., Doddanakere, 29.vi.02, Coll. M.B. Raghunathan.

Remarks A close relative of the Plain Tiger, but mainly found in the wooded areas, distributed throughout the Indian subcontinent, extending to Southeast Asia, and Australia. The food plants belong to the family Asclepiadaceae.

12. *Phalanta phalantha* Drury - Common Leopard

Material examined : 2exs., Pilvarathahalli, 12.ix.03, Coll. G. Thirumalai.

Remarks : This is a widely distributed species, found from Africa to South and Southeast Asia. Found in moist deciduous and disturbed forests throughout the year. Caterpillars feed on plants from different families such as Bixaceae, Smilacaceae and Saliaceae.

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INSECTA : DIPTERA

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INTRODUCTION

The present paper reports 12 species of Diptera (Insecta) under 12 genera and 10 families for the first time from the Bannerghatta National Park, Karnataka.

SYSTEMATIC ACCOUNT

Family STRATIMYIDAE

Stratiomyids (Soldier Flies) are found throughout the world but are particularly diverse in tropical regions. Worldwide there are about 400 genera recognized at present and well over 2,000 species. In India, 73 species under 34 genera of soldier flies are reported so far.

Genus *Adoxomyia* Bezzi

1908. *Adoxomyia* Bezzi Wiedemann, *Wien. Ent. Ztg.*, 27 : 75. Type-species : *Clitellaria dahlia* Meigen

Diagnosis : Antennal segments 1 and 2 black, 3 reddish brown to yellowish, tip black; thorax without definite hair-stripes, but with a dark median stripe surrounded by 4 spots arranged in a square; abdomen generally black.

1. *Adoxomyia heminopla* (Wiedemann)

1819. *Chitellaria heminopla* Wiedemann, *Zool. Mag.*, 1(3) : 30. Type-locally : *Tranquebar, India.*

Material examined : 1♂, Murainagaram, Haropalli Range, stn.3, 22.iii.2004, Coll. K. Rema Devi & Pty.

Diagnosis : Medium, black species, antennal segments 1 and 2 black, 3 reddish brown to yellow; thorax without definite hair stripes, but with a dark medium stripe surround by 4 spots arranged in a square; abdomen generally black; all femora and tibiae anteriorly and posteriorly brownish orange, rest black; wings gray, yellowish brown at centre.

Distribution : India : Bihar, Delhi, Gujarat, Madhya Pradesh, Punjab, Tamil Nadu, Uttar Pradesh and West Bengal.

Elsewhere : Myanmar, Pakistan, Sri Lanka.

Family BOMBYLIIDAE

Bombyliids (Bee Flies) are most frequently found in the arid and semi-arid regions of the world, with a few specialized forms occurring in moist tropical climates. They are commonly found on flowers, hovering in bright sunlight, or resting on warm, bare ground. Many, if not all, are pollen and nectar feeders, with some acting as primary pollinators of species of desert wildflowers.

Genus *Exhyalanthrax* Becker

1916. *Exhyalanthrax* Becker *Annls hist.- nat. Mus. Natn hung.*, **14** : 44 (as subgenus of *Villa* Lioy). Type-species : *anthrax vegans* Loew.

1973. *Oriellus* Hull 8:403 (as subgenus of *Thridanthrax* Osten Sacken). Type-species : *Anthrax stigmula* Klug, 1832 by original description

Diagnosis : The numerous species of this genus have a characteristic appearance of hyaline wings.

2. *Exhyalanthrax keiseri* Francois

1968. *Thyridanthrax keiseri* Francois, *Bull. et Annls Soc. r.ent. Belg.*, **104** : 205. Type-locality : (Coimbatore) Tamil Nadu (India).

Material examined : 1♀, Uthigalanda Damsto, 18.iii.2004, coll. K. Rema Devi & Pty.

Diagnosis : Head black; antennae brownish yellow; flagellum conically produced with dark brown apex; thorax black with sparse white hairs, a pair of indistinct brown longitudinal stripes up to base of scutellum, humeri with plenty of white hairs; scutellum black; one third of wing dark brown covering the entire costal and subcostal cells, gradually reduces its length covering baso-radial cells and baso-medial cells reaching up to the base of anal cell, rest of wing hyaline; all femora black, tibiae brown, abdomen black with scattered pale hairs, sixth tergite with a cross band of white hairs.

Distribution : India : Andaman, Jammu and Kashmir, Tamil Nadu.

Elsewhere : Bangla Desh, Pakistan, Sri Lanka, Thailand.

Genus *Eurycarenum* Loew

1860. *Eurycarenum* Loew, Type-species : *Bombylius laticeps* Loew, by Monotypy

Diagnosis : A very distinctive genus, at once recognized by the pattern of black, white and yellow vestiture, numerous black bristles, and broad head with indented hind margins.

3. *Eurycarenum erectus* Brunetti

1909. *Bombylius erectus* Brunetti, *Rec Indian Mus.*, 2 : 480. Type-locality : Karnataka (India)
Eurycarenum indicus Bowden, 1964 : 65. Type-locality : Maharashtra (India)

Material examined : 1♂, 1♀, Uthigalanda Damsto, 18.iii.2004, Coll. K. Rema Devi & Pty.

Diagnosis : Frons covered with short bright yellow hairs, with two rows of stiff black bristles; one just above, the other just below, the antennae, and reaching from eye; sides of face with rather long, silky, cream-cloured hair, back of head with yellow hairs; thorax cinereous black, with traces of yellow pile, an elongated bunch of strong black bristles at the side, in front of the wings; sides of thorax with long grayish-white hairs, and yellowish hairs immediately below the wings; abdomen apparently blackish brown, sides of 3rd and 4th segments with thick tufts of hairs and the sides of 5th segments with a tuft of black hairs; legs blackish brown; wings absolutely clear, extreme base slightly tawny; halteres light brown.

Distribution : Maharashtra, Karnataka.

Elsewhere : other areas of Oriental Region.

Family DIOPSIDAE

Diopsids (True stalk-eyed flies), commonly known as stalk-eyed flies, are generally distributed throughout the Old World tropics. Adults are easily identified by their characteristic eye stalks, which are found in all taxa, although the stalk lengths vary considerably.

The diopsids comprise of approximately 160 species. Only 8 species under 5 genera are reported from India

Genus *Sphyracephala* Say.

1828. *Sphyracephala* Say, *Am. Ent.*, 3 : 52. Type-species : *Diopsis brevicornis* Say

Diagnosis : Face not divided by a vertical line or sulcus; inner orbital bristle strong; eye stalks developed, though small but stout, scutellum spines with long-apical bristle; both fifth and sixth longitudinal veins present, alula well developed.

4. *Sphyracephala hearseiana* West wood

1845. *Diopsis hearsiana* Westwood, *J. Proc. ent. Soc. Lond.*, **1** : 1844 : 99. Type-locality : India

Material examined : 33♂♂, 17♀♀, G. Anackal, 20.iii.2004, Coll. K. Rama Devi & Pty.

Diagnosis : The short thick eye-stalks easily separate this species (and genus) from all other Oriental Diopsidae and its clear wing separate its congeneric species *cothurnata* Bigot.

Distribution : Chandigarh, Gujarat Punjab.

Eleswhere : Bangladesh.

Family TEPHRITIDAE

Tephritidae (True fruitflies) is a large family of predominantly picture-winged, usually highly ornamented flies with 471 genera and 4,257 species in the world. 187 species are distributed in India. Fruit flies are distributed throughout the temperate and tropical areas of the world.

Genus *Dioxyna* Frey

1994. *Dioxyna* Frey, *Commental. Boil.*, **8**(10) : 62. Type species : *Trypeta sororcula* Wiedemann, 1830.

Diagnosis : Head with produced epistome, proboscis slender, geniculate; labella slender equal in length to lower margin of head; scutellum bears two bristles, dorsocentral in line, wings hyaline, with numerous some what diffused brown spots.

5. *Dioxyna sororcula* (Wiedemann)

1830. *Trypeta sororcula* Wiedemann, *Aussereurop. Zweifl. Insekt.*, **2** : 509. Type-locality : Canary Is;

Material examined : 1♀, Murainagaram, Haropalli Range, stn.3, 22.iii.2004, Coll. K. Rema Devi & Pty.

Diagnosis : Head elongate, epistome and sides of the face produced superior fronto orbital and inferior fronto orbitals two pairs each; proboscis slender, elongate and geniculate with labella equal in length to lower margin of head; dorsocentrals situated between the anterior supraalar; scutellum with a pair of bristles, wing with subcostal cell entirely dark brown.

Distribution : India.

Elsewhere : Widespread Australia, Bonin Island, Cook Island Easter Island, Fiji, French Polynesia (Marquesas, Society Is), Hawaiian Is, Indonesia (Irian Jaya), Marshall Is, Northern Marianas, PNG (Bismarck Arch, PNG).

Family OTIDIDAE

Otitids (Picture-winged flies) may be distinguished from Tephritids (with which they resemble) by the form of the subcostal vein. In Otitidae, the subcostal gently curves toward and reaches the costal margin of the wing while in Tephritidae the subcosta is abruptly bent toward the costal margin and does not reach the costal margin.

Otitids are found on living or decaying vegetation and excrement. About 400 species in 50 genera are known in this family from the world of which only 2 species under the genus *Physiphora* Fallen are only reported from in India.

Genus *Physiphora* Falan

1810. *Physiphora* Fallen, *Sp. ent. Nov. Dipt.*, : 11. Type species : *Chrysomyza splendida* Fallen

Diagnosis : Head at most a little longer than high, medifrons bare, in upper part with 4 swellings; antennal segment 3 rounded apically; humeral bristle usually well developed; wing with basal cell 2 closed by straight zigzag vein.

6. *Physiphora aenea* (Fabricius)

1794. *Musca aenea* Fabricius, *Ent. Syst.*, 4 : 335. Type-locality : "In India Orientale"

Material examined : 9♂♂, 5♀♀, Murainagaram, Haropalli Range, stn.3, 22.iii.2004, coll. K. Rema Devi & Pty

Diagnosis : Epistome, proboscis and palpi black; frontal stripe green or blue; wings with petiolate posterior cell 1; abdomen unicolorous, green, hairs on anterior corners yellowish.

Distribution : India : Assam, Chandigsrh, Himachal Pradesh, Orissa, Punjab and West Bengal.

Elsewhere : Widespread from Seychelles to Samoa; Hawaii to Australia; North and South Americas.

Family SCIOMYZIDAE

The family Sciomyzidae, commonly called marsh flies, are comprises of some 600 species in 60 or so genera found worldwide but only 10 species under 4 genera are

reported from India. Marsh flies are generally slender, yellowish or brownish, 1/4 -1/2 inches long. They have fairly prominent eyes, prominent forward-pointing antennae, and bristles on the femora (upper hind leg). The wings are mottled with various light brown markings according to species. Marsh flies are common along the edges of ponds and rivers, and in marshy areas.

All known larvae of reared living species (about 200) are predaceous or parasitic on freshwater or terrestrial snails. Some are effective biological control agents.

Genus *Sepedon* Latreille

1804. *Sepedon* Latreille, *Nouv. Dict. Hist. nat.*, **24** : 196. Type-species : *Syrphus spegeus* Fabricius

Diagnosis : Slender flies with a median longitudinal depression in lieu of mid-frontal stripe; anterior orbital and ocellar setae absent; antennal segment 2 nearly rod-shaped; thorax without humeral, presutural, 1 post alar 1 or both dorsocentrals, prescutellar acrostichal and 1 pair of scutellar setae; prosternum haired and all parts of pleura with short hairs, sub alar setae absent, hind coxae short haired at inner posterior margin; cerci in male genitalia usually long and exposed.

7. *Sepedon ferruginosa* Wiedemann

1824. *Sepedon ferruginosa* Wiedemann, *Analecta Ent.*, : 56 Type-locality : "East Indies"

Material examined : 1♂, Thattekere, 18.iii.2003, Coll. S. Krishnan & Pty.

Diagnosis : Generally all the coxae bright yellow or reddish yellow, may or may not be shimmered; thorax and abdomen ferruginous.

Distribution : India : Andhra Pradesh, Assam, Bihar, Nagaland, Tamil Nadu, West Bengal.

Elsewhere : Malaya, Nepal, Pakistan, Philippines and Thailand.

Family SEPSIDAE

This family contains 21 described genera and some 250 species distributed in all zoogeographic regions. The adults are most commonly found on low herbage or excrement, dung, and other decaying matter. Some species have been spread over large territories in association with livestock. Adult flies are found mostly on animal and human excrement (less often on other rotting organic matter) where eggs are laid and larvae develop and on nearby vegetation, carrion fermenting tree sap, and shrubs and herbs. Many Sepsidae apparently play an important biological role as decomposers of animal excrement.

Genus *Dicranosepsis* Duda

1926. *Dicranosepsis* Duda, *Annln naturh. Mus. Wien.*, **39** (1925) : 43. Type-species : *Sepsis bicolor* Wiedemann.

8. *Dicranosepsis* sp.

Material examined : 1ex, Thattekere, 18.iii.2003, Coll. S. Krishnan & Pty.

Remarks : The material was damaged.

Family CHLOROPIDAE

The family Chloropidae, sometimes referred to as grass-or frit-flies are found worldwide. Over 2,000 species have been described in more than 160 genera. Adults of living forms occur in grasses, flowers, and some (the “eye gnats”) are attracted to the eyes and open wounds of humans and animals. Larvae are mostly saprophagous or phytophagous, feeding in a variety of habits including cereals and grasses, insect frass, decaying plant matter, and fungi. Others are predaceous or parasitic.

Genus *Pachylophus* Loew

1858. *Pachylophus* Loew, *Berl. Ent. Z.*, **2** : 121. Type-species : *Pachylopuus frontalis* Loew

Diagnosis : Antennal arista somewhat thickened at least with long dense hairs; hind femur thickened, hind tibia correspondingly curved.

9 *Ppachylophus rufescens* (de Meijere)

1904. *Myrmemorpha rufescens* de Meijerae, *Bijdr. Dierk.*, **17-18** : 113. Type-locality : Java.

Material examined : 1♂, Murainagaram, Haropalli Range, stn.3, 22.iii.2004, coll. K. Rema Devi & Pty.

Diagnosis : Frons not projecting beyond eye in front, concolorous with frontal triangle; thorax smooth, with 1 posterior notopleural bristle; halteres white; distance between 2 cross veins; only little more length of posterior cross vein; edite triangle in male genitalia.

Distribution : Assam, Bihar, Himachal Pradesh, Maharashtra, Gujarat, Orissa, Tamil Nadu, Uttar Pradesh and West Bengal.

Elsewhere : Java, Nepal, Philippines, Sumatra, Thailand, Viet Nam: Australia.

Family MUSCIDAE

Muscidae, some of which are commonly known as house flies or stable flies, are worldwide in *Distribution* and contain almost 4,000 described species in over 100 genera. The family contains some of the best known Diptera species due to their synanthropy. However not all are synanthropic. Adults of extant forms can be predaceous, haematophagous, saprophagous, or feed on a number of types of plant and animal exudates. They can be attracted to various substances including sugar, filth, sweat and blood. Larvae occur in various habitats including decaying vegetation, dry and wet soil, nests of insects and birds, fresh water, and carrion. They can be predaceous, coprophagous, or saprophagous.

Genus *Atherigona* Rondani

1865. *Atherigona* Rondani, *Dipterol. ital. Prodr.*, 1 : 97. Type-species : *Anthomyia varia* Meigen.

Diagnosis : A single reclinate upper orbital seta; presutural dorsocentral bristles very small, scarcely distinguishable from the setulose hairs; fore femur without or with at most 1 or 2 pv preapically; greater part of cerci free-lying.

10. *Atherigona* sp.

Material examined : 1 ex., Thattekere, 18.iii.2003, Coll. S. Krishnan & Pty.

Remarks : The material was damaged.

Family CALLIPHORIDAE

The family Calliphoridae (Blowflies) is a cosmopolitan group of about 1000 species, predominantly tropical in *Distribution*, closely related to Muscidae and Sarcophagidae. Adult Blowflies feed on nectar, honey dew and other sweet liquid or liquid products of organic decomposition, which provide the proteins essential to the female for egg maturation. Most Blowfly adults are active during day time. Blowfly larvae usually live in carrion or dung, which help for decomposition. Some species are parasitic on earthworms or land snails. Some live in termites or ants nest.

Genus *Stomorphina* Rondani

1861. *Stomorphina* Rondani *Dipt. Ital. Prodr.*, 4 : 9. Type-species : *Musca lunata* Fabricius.

Diagnosis : Eyes in male subholoptic; arista ciliate only above; thorax in males usually covered with thick, short upright black pil, absent in female first posterior cell open to close petiolate; abdominal macrochaetae absent or marginals only on last two segments.

11 *Stomorphina discolor* (Fabricius)

1794. *Musca discolor* Fabricius, *Ent. Syst.*, 4 : 320. Type-locality : India, Oriental.

Material examined : 2♂♂, 3♀♀, Murainagaram, Haropalli Range, stn. 3, 22.iii.2004, Coll. K. Rema Devi & Pty.

Diagnosis : Antennae and palpus brown; wing with cell R5 narrowly open; abdomen yellowish, with black bands posteriorly on terga 1&2 and with a median longitudinal stripe.

Distribution : Arunachal Pradesh, Assam, Bihar, Chandigarh, Kerala, Manipur, Meghalaya, Uttar Pradesh, West Bengal.

Elsewhere : Other parts of Oriental region; Moluccas

Genus *Bengalia* Robineau-Desvoidy

1830. *Bengalia* Robineau-Desvoidy, *Mem. Pres. Div. Sav. Acad. Sci. Inst. Fr.*, : 425. Type-species : *Bengalia labiata* Robineau-Desvoidy.

Diagnosis : Medium to large flies with velvety brown colour; eyes widely separated in both sexes; antennal arista biplumose to tip; thorax with only prescutellar acrostichals, post sutural dorsocentrals varies from 2-4; scutellum with one apical pairs and two marginal pairs; mid femur usually with profuse bristles, front tibia sometimes with strong bristles, hind tibia may have profuse hair tuft; vein M strongly angled and meet costa before apex of wing, third vein usually spinulose up to r-m cross vein; abdomen with marginal macrochaetae on third and fourth segments.

12. *Bengalia* sp.

Material examined : 1 ex, Murainagaram, Haropalli Range, stn.3,22.iii,2004, Coll. K. Rema Devi & Pty.

Remarks : The material was damaged.

INSECTA HYMENOPTERA (APOCRITA)

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INTRODUCTION

The present account is based on a small collection of Hymenoptera (Apocrita) obtained from the Bannerghatta National Park, Karnataka, one of the important conservation areas in the state.

SYSTEMATIC ACCOUNT

Order HYMENOPTERA

Suborder APOCRITA (ACULEATA)

Superfamily VESPOIDEA

Family SCOLIIDAE

1. *Scolia (Discolia) cyanipennis* Fabricius

1804. *Scolia cyanipennis* Fabricius. Syst. Peiz., 224.

1845. *Scolia caerulans* Lepeletier. Hist. nat. Ins., Hym., 3 : 526

1864. *Scolia (Discolia) cyanipennis* Fabricius : Saussure, Ann. Soc. ent. France, (3) 6 : 209.

2003. *Scolia (Discolia) cyanipennis* Fabricius : Gupta & Jonathan. Fauna of India. Zool. Sur. India : 163.

Diagnostic characters : Female : Length : 16-22 mm. Integument and vestiture entirely black; abdomen with faint blue reflection; wing dark brown with strong blue reflections. Median area of clypeus strongly raised and smooth; frontal fissure extending halfway to anterior ocellus; upper plate of metapleuron punctuate on its upper 0.66 part; first abdominal tergite with a weak antero – median tubercle, upper surface with fine sparse punctures and interspersed large punctures.

Material examined : 1♀, Kuttalahalli, N 12° 41.065' E 77° 37.053'; Alt. 780 mt, 16.ix.03 coll. G. Thirumalai & Party.

Distribution : India : Himachal Pradesh (Kulu), J&K (Jhelum valley), Sikkim, Tamil Nadu, W.Bengal, Karnataka], Sri Lanka.

Remarks : The species is distributed in the Indian sub region.

2. *Scolia (Discolia) Binotata binotata* Fabricius

1804. *Scolia binotata* Fabricius. *Syst. Peiz.* 244.

1805. *Scolia bipunctata* Klug. *Beitr. Nat.*, 1.

1978. *Scolia (Discolia) Binotata* Fabricius : Krombein. *Smithsonian Contr. Zool.*, 283 : 41-43.

2003. *Scolia (Discolia) binotata binotata* Fabricius : Gupta & Jonathan. *Fauna of India. Zool. Surv. India* : 223.

Diagnostic characters : Female : Length : 14-20 mm. Black, third and fourth abdominal tergites with paired large rounded red or light red or light spots, vestiture black, forewing dark brown with blue reflections. Median area of clypeus raised and impunctate, frontal spatium impunctate except for a few close punctures; frontal fissure extending halfway to anterior ocellus; scapulae and mesoscutum medially at its posterior half and scutellum with a few scattered punctures; first abdominal tergite with a prominent antero-median tubercle, a small area behind tubercle impunctate.

Material examined : 1 ♀, Muthyala maduvu., N 12° 41.157' E 77° 39.869'; Alt. 700 mt, 15.ix.03 coll. G. Thirumalai & Party.

Distribution : India : Andhra Pradesh, Delhi, Karnataka, Kerala, Manipur, Rajasthan, Tamil Nadu, Uttaranchal, W. Bengal; Sri Lanka.

Remarks : The species is distributed throughout the Indian subregion.

Superfamily APOIDEA (APIFORMES)

Family APIDAE

Subfamily APINAE

3. *Apis (Micrapis) florea* Fabricius

1787. *Apis florea* Fabricius. *Mant. Ins.*, : 305.

1904. *Apis (Micrapis) florea* : Ashmead, *Proc. Ent. Soc. Wash.*, 6 : 122.

Diagnostic characters : Size small, 6-8 mm; colour black; the basal two or three gastral tergites reddish brown; head, thorax and gaster dull and opaque, very minutely aciculate, pubescent, pubescence on head and thorax white, meta tibia and dorso-lateral margin of meta basitarsus with white setae; wings hyaline and slightly iridescent, forewing length 6-7 mm, distal abecissa of median vein of hind of hind wing absent.

Material examined : 13 ♀♀ (worker), Village pond, Alt. 780 m 27. vi.2002; 3 ♀♀ (worker), Hutchinagunte, Alt. 780 m, 29.vi.2002, coll. M.B. Raghunathan & Party; 3 ♀♀ (worker), Puttunkunte 15.iii.2003, 4 ♀♀ (worker), Gulukkumalai, 17.iii.2003; 5 ♀♀ (worker), Thattekere, 1.8.iii.2003, coll. S. Krishan & Party.

Distribution : India, Sri Lanka, Myanmar and extending in the Malayan region as far as Indonesia.

Remarks : This is the smallest among the honey bees and commonly known as the red dwarf honeybee.

4. *Apis (Apis) cerana indica* Fabricius

1703. *Apis dorsata* Fabricius. *Ent. Syst.* 2 : 328.

Diagnostic characters : Size moderate, 11-12 mm; head thorax and gaster smooth and shining, sparsely pubescent, sometimes densely so; head thorax and apical gastral tergites black, scutellum and basal five tergites of gaster yellow brown, legs rufo-fuscous, wings hyaline, forewing length 7-9 mm, distal abscissa of median vein of hind wing present.

Material examined : 1 ♀ (worker), village pond, Alt. 780m, 27.vi.2002, coll. M.B. Raghunathan & Party.

Distribution : Throughout India, Myanmar, Sri Lanka, extending through Malaysia on the east and the Madagascar on the west.

Remarks : This is the species most often kept in apiaries and commonly called the plains bee.

5. *Apis (Megapis) dorsata* Fabricius

1793. *Apis dorsata* Fabricius. *Ent. Syst.*, 2 : 328

1904. *Apis (Megapis) dorsata* : Ashmead. *Proc. Ent. Soc. Wash.*, 6 : 120.

Diagnostic characters : Size large, 16-18 mm; head thorax and gaster pubescent, more or less sparse or dense; head and mesonotum finely punctured under the pubescence, a short medial, vertical groove below the anterior ocellus; head, thorax, legs and apical three segments of gaster black, more or less pale and fuscous on the hind part of thorax and basal three tergites of gaster honey yellow; forewing fuscous, length 12-15mm, abscissa of median vein of hind wing present.

Material examined : 2 ♀♀, village pond, Alt. 780 m, 27.vi.2002, coll. M.B. Raghunathan & Party; 1 ♀, Gate Swarnamukhi beat, N 12° 49.986' E 77° 34.521', Alt. 800 m; 12.ix.2003; 1 ♀, Station no.II, 21.iii.2004, coll. G. Thirumalai & Party; 23 ♀♀,

Hosekere harohalli, 23.iii.04, coll. K. Rema Devi & Party.

Distribution : Throughout India, Sri Lanka, Myanmar, China, Malaysia and Java.

Remarks : Commonly called the giant honeybee due to large body size; builds nests most often on high trees and produce maximum honey and wax.

Suborder APOCRITA (PARASITICA)
Superfamily CHALCIDOIDEA
Family CHALCIDIDAE
Subfamily CHALCIDINAE

6. *Brachymeria bengalensis* (Cameron)

1879. *Chalcis bengalensis* Cameron. *Mem. Manchester Soc.*, XLI(4) : 39.

1989. *Brachymeria bengalensis* (Cameron) : Narendran. *Oriental Chalcididae Zool. Mon.*, : 261.

Diagnostic characters : Length : 4.5 mm. Hind femora red (often with a black patch of varying size on outer disc) with yellow spot or patch at apex; apex of scutellum distinctly bilobed; hind tibia yellow with base black or brown or reddish brown, ventrolateral margins of hind tibia with or without black colour.

Material examined : 1 ♀, 1 ♂, Gate Swarnamukhi beat, N 12° 49.986' E 77° 34.521'; Alt. 800 m, 12.ix.2003. coll. G. Thirumalai & Party.

Distribution : All over the Oriental region and Japan.

Remarks : This is a common *Brachymeria* species of India.

SUMMARY

The present study records 6 species of Hymenoptera (Apocrita) belonging to 3 genera under 3 superfamilies and 3 families from the Bannerghatta National Park, Karnataka. All the species are reported for the first time from the area.

ARACHNIDA : SCORPIONIDA

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INTRODUCTION

A comprehensive account on the scorpion fauna of India including Sri Lanka and Myanmar was provided by Pocock (1900). Subsequently Tikader and Bastawade (1983) and Bastawade (1986 a, b and 1992) Bastawade *et al.*, 2004 and Thulsi Rao *et.al.* 2005, updated the knowledge of the taxonomy of scorpionida by bringing the total number of species known in India to 102. However the scorpion fauna of Bannerghatta National Park was not known so far. Four extensive surveys carried out by the scientist of Zoological Survey of India, Southern Regional Station, during the year 2002 to 2004 yielded 3 species.

SYSTEMATIC ACCOUNT

1. *Lychas (Endotrichus) tricarinatus* Simon

1884. *Lychas tricarinatus* Simon, *Ann. Mus. civ. Sto. na. Genova*, **20** : 371

1983. *Lychas (Endotrichus) tricarinatus*, Tikader and Bastawade, *The Fauna of India, Scorpions, Scorpionida Arachnida*, Vol. **III** : 73.

Material Examined : 45 exs., Mutchinagunta, Alt. 780 mts., 29.6.02, Coll. M.B. Raghunathan; 11 exs., Udugabande, 11.9.03, Coll. G. Thirumalai; 15 exs., Kutalla Halli, Alt. 780 mts., 16.9.03, Coll. G. Thirumalai; 2 exs., Swarnamuki Beet, Ramaswamy Pond, Alt. 810 mts., 13.9.03, coll. G. Thirumalai; 1 ex., Seetha Katte, 17.3.04, Coll. K. Rema Devi; 2 exs., Gubamadugu, 20.3.04, Coll. K. Rema Devi (Total 76 Exs.).

Distribution : India : Madhya Pradesh; Karnataka; Kerala; Andhra Pradesh; Tamil Nadu.

2. *Stenochirus politus* Pocock

1899. *Stenochirus politus* Pocock, *J.Bombay nat. Hist. Soc.*, **12** : 262

1983. *Stenochirus politus* : Tikader and Bastawade, *The Fauna of India, Scorpions : Scorpionida, Arachnida*, Vol., **III** : 153.

Material Examined : 1 ex., Hitchinagunta, Alt. 780 mts., 29.6.02, Coll. M.B. Raghunathan.

Distribution India : Karnataka; Madhya Pradesh.

3. *Heterometrus* (*Chersonesometrus*) *kanarensis* (Pocock)

1900. *Palamnaeus scaber kanaraensis* Pocock, *Fauna Brit. India, Arachn.*, : 93.

1981. *Heterometrus* (*Chersonesometrus*) *phipsoni kanaraensis* Couzjin, *Zool. Verln.*, **184** : 151.

1983. *Heterometrus* (*Chersonesometrus*) *kanarensis* : Tikader and Bastawade, *The Fauna of India, Scorpions : Scorpionida : Arachnida*, Vol. **III** : 636-641.

Material Examined : 1 ex., Uduabande, 11.9.03, Coll. G.Thirumalai; 14exs., Kutala Halli, Alt. ts., 16.3.03, Coll. G.Thirumalai; 13 exs., Muthyala Madugu, Alt.700 mts., 15.9.03, G.Thirumalai; 1 ex., Puttanakunte, 17.3.04, Coll. K.Rema Devi; 13 exs., Thatte kare, 19.3.04, Coll. K.Rema Devi, 21 exs., Jodukonta Plantation, 16.3.04, Coll. K.Rema Devi. (Total 63 exs.)

Distribution : India : Karnataka; Maharashtra, Kerala.

SUMMARY

From 11 localities surveyed within the Bannerghatta National Park during June 2002 to March 2004, 3 species were collected Viz. *Lychas* (*Endotrichus*) *tricarinatus*, *Stenochirus politus* and *Heterometrus* (*C.*) *kanarensis*. All the species have been already reported from Karnataka state, but are new records to Bannerghatta National Park.

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MOLLUSCA FRESHWATER GASTROPODA

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INTRODUCTION

This work presents the occurrence of 8 species of freshwater Gastropoda (Mollusca) under 5 genera and 4 families in Bannerghatta National Park, Karnataka.

SYSTEMATIC LIST

Family VIVIPARIDAE

Subfamily BELLAMYINAE

Genus *Bellamyia* Jousseaume

1. *Bellamyia bengalensis* (Lamarck)
2. *Bellamyia dissimilis* (Mueller)
3. *Bellamyia micron* (Annandale)

Family THIARIDAE

Subfamily THIARINAE

Genus *Thiara* Roding.

4. *Thiara (Thiara) scabra* (Muller)
5. *Thiara (Melanoides) tuberculata* (Muller)

Subfamily MELANATRIINAE

Genus *Brotia* H. and A. Adams.

6. *Brotia (Antimalania) costula* (Refinesque)

Family Lymnaeidae

Genus *Lymnaea* Lamarck.

7. *Lymnaea (Pseudosuccinea) acuminata* Lamarck.

Family PLANORBIDAE

8. *Indoplanorbis exustus* (Deshayes)

SYSTEMATIC ACCOUNT

1. *Bellamya bengalensis* (Lamarck, 1822)

1822. *Paludina bengalensis* Lamarck, *Hist. nat. Anim. Sans. Vert.*, 6(2) : 174.

1989. *Bellamya bengalensis* : (Lamarck), Subba Rao. *Zool. Surv. India. Hand book : Freshwater Molluscs of India* : 45-47.

Material examined : 2 exs, from Gollahalla, 17.iii.2004, Coll: K. Rema Devi.

Distribution : Throughout India.

Remarks : Shell thin with three or more colour bands. 8 forms are recognized.

2. *Bellamya dissimilis* (Mueller, 1774)

1774. *Nerita dissimilis* Mueller, *Hist. Verm. Text.*, Pt 2 : 184.

1989. *Bellamya dissimilis* (Mueller): Subba Rao. *Zool. Surv. India. Hand book : Freshwater Molluscs of India* : 48-49.

2004. *Bellamya dissimilis* (Mueller): Surya Rao. *Zool. Surv. India. Fauna of Desert National Park., Conservation Area Series*, 19 : 40.

Material examined : 3exs from Doddapadi, 17.iii.2004, Coll: K. Rema Devi.

Distribution : Throughout India.

Remarks : Shell small, High and narrow. Without dark spiral bands, whorls 5.

3. *Bellamya micron* (Annandale, 1921)

1921. *Vivipara micron* Annandale. *Rec. Indian Mus.*, 22 : 550.

1989. *Bellamya micron* (Annandale): Subba Rao. *Zool. Surv. India. Hand book : Freshwater Molluscs of India* : 49.

Material examined : 1ex from Doddapadi, 17.iii.2004, Coll: K. Rema Devi.

Distribution : Manipur. New record to Karnataka.

Remarks : *Bellamya micron* is a closely related to *Bellamya dissimilis*.

4. *Thiara (Thiara) scabra* (Mueller, 1774)

1774. *Buccinum scabra* Mueller. *Hist. Verm. Terr. Fluv.*, 2 : 136.

1989. *Thiara (Thiara) scabra* (Mueller): Subba Rao. *Zool. Surv. India. Hand book : Freshwater Molluscs of India* : 96-97.

Material examined : 18 exs from Doddannakere, 17.iii.2004, Coll: K. Rema Devi.

Distribution : Throughout India except Kashmir.

Remarks : Sutures distinct, shell sculptured with vertical ribs whorls shouldered above and rounded below the row of spines. Mostly occurring in running water.

5. *Thiara (Melanoides) tuberculata* (Mueller, 1774)

1774. *Neritia tuberculata* Mueller. *Hist. Verm. Terr. Fluv.*, 2 : 191.

1989. *Thiara (Melanoides) tuberculata* (Mueller): Subba Rao. *Zool. Surv. India. Hand book : Freshwater Molluscs of India* : 103-105.

2004. *Thiara (Melanoides) tuberculata* (Mueller): Surya Rao. *Zool. Surv. India. Fauna of Desert National Park., Conservation Area Series*, 19 : 41-42.

Material examined : 2 exs from Doddannakere, 17.iii.2004, Coll: K. Rema Devi.

Distribution : Throughout India except Kashmir.

Remarks : Shell with a high spire and large body whorl, sculptured with vertical ribs. Whorls 10-12. Also extends to brackish waters.

6. *Brotia (Antimelania) costula* (Rafinesque, 1833)

1833. *Melania costula* Rafinesque. *Atlantic Journ.*, 5 : 166.

1989. *Brotia (Antimelania) costula* : Subba Rao. *Zool. Surv. India. Hand book : Freshwater Molluscs of India* : 108-109.

Material examined : 7 ex from Muthyala Madu, 1 ex from Pillavarthahalli, 12.ix.2003, Coll: G. Thirumalai.

Distribution : Assam, Bihar, West Bengal, Manipur. New record to Karnataka.

Remarks : Shell with 12-14 whorls, sculptured with spiral ridges. Many varieties are known and prefer stagnant water.

7. *Lymnaea (Pseudosuccinea) acuminata* Lamarck, 1822

1822. *Lymnaea acuminata* Lamarck. *Hist. nat. Anim. Sans. Vert.*, 6 (2) : 160

1989. *Lymnaea (Pseudosuccinea) acuminata* Lamarck: Subba Rao. *Zool. Surv. India. Hand book : Freshwater Molluscs of India* : 126-128.

Material examined : 18 exs from Doddannakere, 17.iii.2004, Coll: K. Rema Devi; 8 exs from Doddapadi, 17.iii.2004, Coll: K. Rema Devi; 11 exs from Gollahalli, 20.iii.2004, Coll: K. Rema Devi; 27 exs from Bethahalli, Kavalui, 23.iii.2004, Coll: K. Rema Devi.

Distribution : Throughout India.

Remarks : The outer lip very much expanded and convex in outline. Spire acuminate. It occurs in permanent water bodies with vegetation. Nine forms are recognized in this species.

8. *Indoplanorbis exustus* (Deshayes, 1834)

1834. *Planorbis exustus* Deshayes in *Belangar. Voy. Indes. Orientales.* : 417, pl. i. figs 11-13.

1989. *Indoplanorbis exustus* (Deshayes): Subba Rao. *Zool. Surv. India. Hand book : Freshwater Molluscs of India* : 142-143.

2004. *Indoplanorbis exustus* (Deshayes): Patil and Ramakrishna. *Zool. Surv. India. Fauna of Pench National Park, Conservation Area Series, 20* : 150.

Material examined : 22 exs from Doddannakere, 17.iii.2004, Coll: K. Rema Devi; 15 exs from Doddapadi, 17.iii.2004, Coll: K. Rema Devi; 38 exs from Bothanapalli, 22.iii.2004, Coll: K. Rema Devi; 19 exs from Thallebande, 17.iii.2004, Coll: K. Rema Devi; 1 ex from MuthyalaMadu, 1 ex from Pillavarthahalli, 12.ix.2003, Coll: G. Thirumalai; 15.ix.2003, Coll: G. Thirumalai; 1 ex from Kukkahalahalli, 16.ix.2003, Coll: G. Thirumalai

Distribution : Throughout India.

Remarks : Shell large and thick. Sutures deeply impressed. Aperture ear shaped. Sinistral animal. A number of trematodes develop to Cercarial stage in this species.

SUMMARY

A total of 8 species belonging to 4 families and 5 genera are recorded during the present study. *Bellamya micron* (Annandale) and *Brotia (Antimelania) costula* are new records to Karnataka state.

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PISCES

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INTRODUCTION

This study is based on Ichthyofaunal collections made at Bannerghatta National Park, Karnataka and deals with 26 species of fresh water fishes included under 8 families and 4 orders.

Identifications are based on standard books viz. Day (1875-78), Talwar and Jhingran (1991), Jayaram (1999) and Menon (1999). The specimens were registered and deposited in the reserve collections of the Southern Regional Station.

SYSTEMATIC LIST

Order CYPRINIFORMES

Family CYPRINIDAE

Subfamily DANIONINAE

Tribe **Oxygasterini**

1. *Salmostoma clupeioides* (Bloch)

Tribe **Danionini**

2. *Esomus barbatus* (Jerdon)
3. *Esomus thermoicos* (Valenciennes)
4. *Danio malabaricus* (Jerdon)
5. *Rasbora caverii* (Jerdon)
6. *Amblypharyngodon microlepis* (Bloch)

Subfamily CYPRININAE

Tribe **Cyprinini**

Subtribe **Cyprini**

7. *Cyprinus carpio communis* (Linnaeus)

Subtribe **Systomi**

8. *Puntius bimaculatus* (Bleeker)
9. *Puntius cauveriensis* (Hora)
10. *Puntius chola* (Hamilton)
11. *Puntius dorsalis* (Jerdon)
12. *Puntius sarana subnasutus* (Valenciennes)

Tribe **Labeonini**Subtribe **LABEONES**

13. *Cirrhinus fulungee* (Sykes)
14. *Labeo ariza* (Hamilton)

Subfamily **GARRINAE**

15. *Garra mullya* (Sykes)

Family **BALITORIDAE**Subfamily **NOEMACHEILINAE**

16. *Schistura denisoni denisoni* (Day)

Family **COBITIDAE**

17. *Lepidocephalus thermalis* (Valenciennes)

Order **SILURIFORMES**Family **CLARIIDAE**

18. *Clarias batrachus* (Linnaeus)

Order **CYPRINODONTIFORMES**Family **POECILIDAE**

19. *Gambusia affinis* (Baird & Girard)
20. *Poecilia reticulata* (Peters)

Order **PERCIFORMES**Family **CHANDIDAE**

21. *Chanda nama* (Hamilton)
22. *Parambassis ranga* (Hamilton)

Family **CICHLIDAE**

23. *Oreochromis mossambica* (Peters)

Family OSPHRONEMIDAE
Subfamily MACROPODUSINAE

24. *Pseudosphromenus cupanus* (Valenciennes)

Family CHANNIDAE

25. *Channa orientalis* (Schneider)

26. *Channa punctatus* (Bloch)

SYSTEMATIC ACCOUNT

1. *Salmostoma clupeioides* (Bloch)

1782. *Cyprinus clupeioides* Bloch, *Naturges ausland*, 12 : 49, pl. 408, fig. 2 (Type locality : "Indian Ocean", evidently not the ocean but some fresh water)

1991. *Salmostoma clupeioides*, Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*. Vol. I : 323.

Material examined : 2 exs., 114.0–117.0 mm. SL., F.7370, Uruganadoddi, 19.03.04, coll. K. Rema Devi & T.J. Indra.

Distribution : India : Cauvery, Godavari, Krishna, Narmada and Tapi river systems. Recorded from Nasik, Deolali and Jabalpur. Also Myanmar according to Day (1878).

2. *Esomus barbatus* (Jerdon)

1849. *Leuciscus barbatus* Jerdon, *Madras J. Lit. & Sci.*, 15 : 322 (Type locality : Bowany river, S. India)

1991. *Esomus barbatus* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries*, Vol. I : 376.

Material examined : 5 exs., 59.0–64.0 mm. SL., F.7416, Muninagaram, 22.03.04, Coll. K. Rema Devi & T.J. Indra.

Distribution : India : Karnataka and Tamil Nadu.

3. *Esomus thermoicos* (Val.)

1842. *Nuria thermoicos* Valenciennes, *Hist. nat. Poiss.*, 16 : 238, pl. 472 (Type locality : Hot springs at Kanniya, Sri Lanka)

1991. *Esomus thermoicos* : Talwar & Jhingran, *Inland Fishes of India and Adjacent Countries*, Vol. I : 378.

Material examined : 1 ex., 33.0 mm. SL., F. 7309, Chikrahalli, 16.03.03, Coll. S. Krishnan; 1 ex., 44.0 mm. SL., F.7288, Thattekere, 18.03.2003, Coll. S. Krishnan; 2

exs., 29.0–33.0 mm. SL., F. 7348, Palankuppai valla, 17.09.03, Coll. G. Thirumalai; 4 exs., 62.0–72.0 mm. SL., F. 7361, Uthigabande, 18.03.04, Coll. K. Rema Devi & T.J. Indra; 25 exs., 40.0–75.0 mm. SL., F. 7388, Uthigabande, 18.03.04, Coll. K. Rema Devi & T.J. Indra; 1 ex., 55.0 mm. SL., F. 7402, Uchanakunte, 18.03.04, Coll. K. Rema Devi & T.J. Indra; 6 exs., 68.0–84.0 mm. SL., F. 7371, Urugandoddi, 19.03.04, Coll. K. Rema Devi & T.J. Indra.

Distribution : India : Southern India; Sri Lanka.

Remarks : This species earlier known only from Sri Lanka is now found to be widespread in South India.

4. *Danio malabaricus* (Jerdon)

1849. *Perilampus malabaricus* Jerdon, *Madras J. Lit. & Sci.*, **15** : 325 (Type locality : Malabar).

1991. *Danio malabaricus*, Talwar and Jhingran, *Inland fishes of India and Adjacent countries*, Vol. I : 370.

Material examined : 5 exs., 41.0 – 60.0 mm. SL., F. 7307, Urugunadoddi, 18.03.03, Coll. S. Krishnan; 24 exs., 25.0 – 55.0 mm. SL., F. 7349, Muthyala maduvu, 15.09.03, Coll. G. Thirumalai; 1 ex., 65.0 mm. SL., F. 7408, Muthiyala maduvu, 20.03.04, Coll. K. Rema Devi & T.J. Indra.

Distribution : India (Western Ghats) and Sri Lanka. Inhabits clear flowing waters, streams, ponds and tanks.

5. *Rasbora caverii* (Jerdon)

1849. *Leucisus caverii* Jerdon, *Madras J. Lit. & Sci.*, **15** : 320 (Type locality : Cauvery River Karnataka).

1991. *Rasbora caverii* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries*, Vol. I : 388

Material examined : 2 exs., 49.0–110.0 mm. SL., F. 7282, Mooleygundi, 15.03.03, Coll. S. Krishnan; 2 exs., 43.0–46.0 mm. SL. Mooleygundi, 15.03.03, Coll. S. Krishnan; 3 exs., 43.0–48.0 mm. SL., F. 7297, Gaddhealla, 15.03.03, Coll. S. Krishnan; 6 exs., 18.0–47.0 mm. SL., F. 7301, Udigebandi, 16.03.03, Coll. S. Krishnan; 4 exs., 24.0–46.0 mm. SL., F. 7310, Chikrahalli, 16.03.03, Coll. S. Krishnan; 1 ex., 69.0 mm. SL., F. 7306, Urugundoddi, 18.03.03, Coll. S. Krishnan; 1 ex., 38.0 mm. SL., F. 7289, Thattekere, 18.03.03, Coll. S. Krishnan; 23 exs., 20.0–55.0 mm. SL., F. 7355, Doddannakere, 17.03.04, Coll. K. Rema Devi & T.J. Indra; 2 exs., 32.0–47.0 mm. SL., F. 7398, Ghaddehalla, 17.03.04, Coll. K. Rema Devi & T.J. Indra; 16 exs., 20.0–55.0 mm. SL., F. 7389, Uthigabande, 18.03.04, Coll. K. Rema Devi & T.J. Indra; 3 exs., 65.0–82.0 mm. SL., F. 7362, Uthigabande, 18.03.04, Coll. K. Rema Devi & T.J. Indra; 22 exs., 40.0–120.0 mm. SL., F. 7366, Moolegundi, 18.03.04, Coll. K. Rema Devi &

T.J. Indra ; 1 ex., 118.0 mm. SL., F. 7372, Uruganadoddi, 19.03.04, Coll. K. Rema Devi & T.J. Indra; 2 exs., 23.0–80.0 mm. SL., F. 7409, Muthiyala Maduvu, 20.03.04, Coll. K. Rema Devi & T.J. Indra; 15 exs., 20.0–50.0 mm. SL., F. 7415, Muninagaram, 22.03.04, Coll. K. Rema Devi & T.J. Indra; 7 exs., 32.0–80.0 mm. SL., F. 7392, Bantanalu, 23.03.04, Coll. K. Rema Devi & T.J. Indra; 2exs., 67.0 – 68.0 mm. SL., F. 7385, Thalebande, 24.03.04, Coll. K. Rema Devi & T.J. Indra.

Distribution : India (Southern India, Notably Karnataka, especially the Cauvery Basin, Javadi Hills, Eastern Ghats) and Sri Lanka.

6. *Amblypharyngodon microlepis* (Bloch)

1839. *Leuciscus pellucidus* McClelland, *Asiat. Res.*, 19 : 293, 408 (Type locality : Ganga River and Brahmaputra River)

1991. *Amblypharyngodon microlepis* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Counties*, Vol. I : 337.

Material examined : 22 exs., 19.0–63.0 mm. SL., F. 7414, Muninagaram, 22.03.03, Coll. K. Rema Devi & T.J. Indra.

Distribution : India (Eastern and southern India) and Bangladesh.

7. *Cyprinus carpio communis* (Linnaeus)

1758. *Cyprinus carpio* Linnaeus, *Systema Naturae*, ed. 10, 1 : 320 (Type locality : Europe).

1991. *Cyprinus carpio communis*, : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries*, Vol. I : 184.

Material examined : 1 ex., 143.0 mm. SL., F. 7299, Thattekere, 18.03.03, Coll. S. Krishnan.

Distribution : Naturally found all through America, China, Europe, Japan, Korea and Taiwan, Introduced into India in 1939.

8. *Puntius bimaculatus* (Bleeker)

1864. *Gnathopogon bimaculatus* Bleeker, *Verh. Nat. Holl. Maatsch, Haarlem*, (2) 20 : 17, pl. 4, Fig. 1 (type locality : Ceylon)

1991. *Puntius bimaculatus* : Talwar & Jhingran, *Inland Fishes of India and Adjacent Countries*, Vol. I : 259.

Material examined : 28 exs., 19.0–40.0 mm. SL., F. 7284, Mooleygundi, 15.03.03, Coll. S. Krishnan; 6 exs., 29.0–48.0 mm. SL., F. 7293, Gaddhealla, 15.03.03, Coll. S. Krishnan; 3 exs., 38.0–42.0 mm. SL., F. 7302, Udigebandi, 16.03.03, Coll. S. Krishnan; 2 exs., 38.0–40.0 mm. SL., F. 7311, Chikrahalli, 16.03.03, Coll. S. Krishnan; 40 exs.,

29.0–43.0 mm. SL., F. 7395, Ghaddehalla, 17.03.04, Coll. K. Rema Devi & T.J. Indra; 2 exs., 17.0–21.0 mm. SL., Ebella, 14.09.03, Coll. G. Thirumalai; 4 exs., 24.0–34.0 mm. SL., F. 7350, Muthyala maduvu, 15.09.03, Coll. G. Thirumalai; 6 exs., 21.0–60.0 mm. SL., F. 7367, Moolegundi, 18.03.04, Coll. K. Rema Devi & T.J. Indra; 6 exs., 26.0–45.0 mm. SL., F. 7403, Uchanakunte, 18.03.04, Coll. K. Rema Devi & T.J. Indra; 2 exs., 21.0–23.0 mm. SL., Uthigabande, 18.03.04, Coll. K. Rema Devi & T.J. Indra; 1 ex., 42.0 mm. SL., F. 7376, Uruganadoddi, 19.03.04, Coll. K. Rema Devi & T.J. Indra; 1 ex., 18.0 mm. SL., Golla Jaalle Selu, 20.03.04, Coll. K. Rema Devi & T.J. Indra; 1 ex., 23.0 mm. SL., Muninagaram, 22.03.04, Coll. K. Rema devi & T.J. Indra; 2 exs., 31.0–54.0 mm. SL., F. 7393, Bantanalu, 23.03.04, Coll. K. Rema Devi & T.J. Indra; 1 ex., 45.0 mm. SL., F. 7383, Hosekere New Tank, Bantanalu, 23.03.04, Coll. K. Rema Devi & T.J. Indra; 1 ex., 42.0 mm. SL., F. 7384, Bettahalli Kavalu, 23.03.04, Coll. K. Rema Devi & T.J. Indra; 68 exs., 23.0–56.0 mm. SL., F. 7386, Thalebande, 24.03.04, Coll. K. Rema Devi & T.J. Indra.

Distribution : Southern India and Sri Lanka.

9. *Puntius cauveriensis* (Hora)

1956. *Barbus cauveriensis* Hora, *Rec. Indian. Mus.*, **39**(1) : 20, fig.7 (Type locality : Cauvery river, Coorg, Karnataka State)

1991. *Puntius cauveriensis* : Talwar and Jhigran, *Inland Fishes of India and adjacent Countries*. Vol. I : 263.

Material examined : 1 ex., 27.0 mm. SL., F. 7312, Chikrahalli, 16.03.03, Coll. S. Krishnan.

Distribution : India : Cauvery river (Karnataka).

10. *Puntius chola* (Hamilton)

1822. *Cyprinus chola* Hamilton–Buchanan, *Fishes of Ganges* : 312, 289 (Type locality : Northeastern parts of Bengal).

1991. *Puntius chola* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries*, Vol. I : 262.

Material examined : 1 ex., 68.0 mm. SL F. 7300, Thattekere, 18.03.03, Coll. S. Krishnan; 1 ex., 51.0 mm. SL., F. 7344, Matheswara Kere, 14.09.03, Coll. G. Thirumalai; 5 exs., 26.0–59.0 mm. SL., F. 7412, Muninagaram, 22.03.04, Coll. K. Rema Devi & T.J. Indra.

Distribution : India (throughout), Bangladesh, Myanmar, Nepal, Pakistan and Sri Lanka.

11. *Puntius dorsalis* (Jerdon)

1849. *Systomus dorsalis* Jerdon, *Madras J. Lit & Sci.*, **15**: 314 (Type locality : Tanks and rivers in neighbourhood of Madras).

1991. *Puntius dorsalis* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries*. Vol. I : 268

Material examined : 3 exs., 45.0–112.0 mm. SL., F.7373. Urugandoddi, 19.03.04, Coll. K. Rema Devi & T.J. Indra; 15 exs., 30.0 – 82.0 mm. SL., F. 7411, Muninagaram, 22.03.04, Coll. K. Rema Devi & T.J. Indra.

Distribution : India (Cauvery and Krishna river systems in Andhra Pradesh, Karnataka, Kerala, Mahanadi in Orissa and Narmada at Hoshangabad), Sri Lanka.

12. *Puntius sarana subnasutus* (Valenciennes)

1842. *Barbus subnasutus* Valenciennes, *Hist. nat. Poiss.*, **16** : 154 (Type locality : Pondicherry).

1991. *Puntius sarana subnasutus* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries*. Vol. I : 285

Material examined : 1 ex., 63.0 mm. SL., F. 7341, Matheswara Kere, 14.09.03, Coll. G. Thirumalai; 7 exs., 28.0–42.0 mm. SL., F. 7346, Palankuppai valla, 17.09.03, Coll. G. Thirumalai; 1 ex., 91.0 mm. SL., F. 7360, Uthigabande, 18.03.04, Coll. K. Rema Devi & T.J. Indra ; 4 exs., 114.0–135.0 mm. SL., F. 7375, Urugandoddi, 19.03.04, Coll. K. Rema Devi & T.J. Indra ; 2 exs., 28.0–55.0 mm. SL., F. 7413, Muninagaram, 22.03.04, Coll. K. Rema Devi & T.J. Indra.

Distribution : India : Peninsular India, South of Kirshan river system.

13. *Cirrhinus fulungee* (Sykes)

1841. *Chondrostoma fulungee* Sykes, *Trans. Zool. Soc. Lond.*, **2**: 358 (Type locality : Deccan).

1991. *Cirrhinus fulungee*, Talwar and Jhingan, *Inland Fishes of India and Adjacent Countries*. Vol. I : 171.

Material examined : 5 exs., 50.0–71.0 mm. SL., F. 7283, Mooleygundi, 15.03.03, Coll. S. Krishnan; 1 ex., 48.0 mm. SL., F. 7294, Gaddhealla, 15.03.03, Coll. S. Krishnan; 21 exs., 73.0–110.0 mm. SL., F. 7364, Uthigabande, 18.03.04, Coll. K. Rema Devi & T.J. Indra; 134 exs., 54.0–117.0 mm. SL., F. 7369, Moolegundi, 18.03.04, Coll. K. Rema Devi & T.J. Indra ; 26 exs., 25.0–38.0 mm. SL., F. 7390, Uthigabande, 18.03.04, Coll. K. Rema Devi & T.J. Indra.

Distribution : India : Maharashtra and Karnataka ; probably also other parts of Peninsular India.

14. *Labeo ariza* (Ham.)

1822. *Cyprinus ariza* Hamilton–Buchanan, *Fishes of Ganges* : 331, 391 (Type locality : Brahmaputra river)

1991. *Labeo ariza* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries*. Vol. I : 198.

Material examined : 10 exs., 180.0–220.0 mm. SL., F. 7419, Hosekere New Tank, 23.03.04, Coll. K. Rema Devi & T.J. Indra.

Distribution : Peninsular India : Nilgiri Hills, Wynad and Cauvery river system.

15. *Garra mullya* (Sykes)

1841. *Chondrostoma mullya* Sykes, *Trans. Zool. Soc. Lond.*, 2 : 359, pl.62 fig. 3 (Type locality : Bheema river at Daunde, nr. Poona).

1991. *Garra mullya* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries*, Vol. I : 429.

Material examined : 6 exs., 52.0–65.0 mm. SL., F. 7285, Mooleygundi, 15.03.03, Coll. S. Krishnan; 2 exs., 45.0–65.0 mm. SL., F. 7308, Uruganadoddi, 18.03.03, Coll. S. Krishnan; 1 ex., 61.0 mm. SL., F. 7363, Uthigabande, 18.03.04, Coll. K. Rema Devi & T.J. Indra; 4 exs., 63.0–73.0 mm. SL., F. 7368, Moolegundi, 18.03.04, Coll. K. Rema Devi & T.J. Indra; 2 exs., 75.0–78.0 mm. SL., F. 7378, Uruganadoddi, 19.03.04, Coll. K. Rema Devi & T.J. Indra.

Distribution : Throughout India except Assam and Himalaya.

16. *Schistura denisoni denisoni* (Day)

1867. *Nemacheilus denisonii* Day, *Proc. Zool. Soc. Lond* : 287 (type locality : Bhowany river, base of Nilgiris).

1991. *Nemacheilus denisonii* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries*, Vol. I : 476.

1991. *Schistura denisonii denisonii* : Jayaram, *The Freshwater Fishes of Indian Regions* : 181

Material examined : 3 exs., 29.0–42.0 , F. 7296, Gaddhealla, 15.03.03, Coll. S. Krishnan; 1 ex., 29.0 mm. SL., F. 7304, Udigebandi, 16.03.03, Coll. S. Krishnan; 1 ex., 37.0 mm. SL., F. 7314, Chikrahalli, 16.03.03, Coll. S. Krishnan; 3 exs., 29.0–39.0 mm. SL., F. 7399, Ghaddehalla, 17.03.04, Coll. K. Rema Devi & T.J. Indra; 3 exs., 40.0–51.0 mm. SL., F. 7356, Doddannakere, 17.03.04, Coll. K. Rema Devi & T.J. Indra; 3 exs., 25.0–32.0 mm. SL., F. 7405, Madeshpura Koil Kere, 19.03.04, Coll. K. Rema Devi & T.J. Indra; 5 exs., 35.0–63.0 mm. SL., F. 7379, Uruganadoddi, 19.03.04, Coll. K. Rema Devi & T.J. Indra.

Distribution : Peninsular India, Chota Nagpur plateau (Bihar) and Bastar (Madhya Pradesh).

17. *Lepidocephalus thermalis* (Val.)

1846. *Cobitis thermalis* Valenciennes, *Hist. nat. Poiss.*, **18** : 78 (type Locality : Malabar).

1991. *Lepidocephalus thermalis* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries*. Vol. I : 527.

Material examined : 1 ex., 36.0 mm. SL., F. 7295, Gaddhealla, 15.03.03, Coll. S. Krishnan; 1 ex., 32.0 mm. SL., F. 7303, Udigebandi, 16.03.03, Coll. S. Krishnan; 2 exs., 35.0–43.0 mm. SL., F. 7313, Chikrahalli, 16.03.03, Coll. S. Krishnan; 2 exs., 48.–51.0 mm. SL., F. 7290, Thattekere, 18.03.03, Coll. S. Krishnan; 5 exs., 40.0–41.0 mm. SL., F. 7396, Ghaddehalla, 17.03.04, Coll. K. Rema Devi & T.J. Indra; 1 ex., 49.0 mm. SL., F. 7377, Uruganadoddi, 19.03.04, Coll. K. Rema Devi & T.J. Indra; 1 ex., 41.0 mm. SL., F. 7404, Madeshpura Koil Kere, 19.03.04, Coll. K. Rema Devi & T.J. Indra; 1 ex., 43.0 mm. SL., F. 7417, Muninagaram, 22.03.04, Coll. K. Rema Devi & T.J. Indra; 2 exs., 41.0–44.0 mm. SL., F. 7387, Thakebande, 24.03.04, Coll. K. Rema devi & T.J. Indra.

Distribution : India : S. India, South of Krishna river system, Karnataka, Kerala, Tamil Nadu; Sri Lanka.

18. *Clarias batrachus* (Linnaeus)

1758. *Clarias batrachus* Linnaeus, *Syst. Nat.*, 1st ed. **10** : 305, 1758 (Type locality : Assam and Africa)

1991. *Clarias batrachus* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries*. Vol. II : 685.

Material examined : 1 ex., 235.0 mm. SL., F. 6948, Ellamalappa Kere, Avalahalli, 15.03.02, Coll.

S. Krishnan.

Distribution : India, Borneo, Indonesia, Myanmar, Nepal, Pakistan, Philippines and Sri Lanka.

19. *Gambusia affinis* (Baird & Girard)

1853. *Heterandria affinis* Baird and Girard, *Proc. Acad. Nat. Sci. Philad.*, **6**: 390 (Type locality : San Antonio river drainage, Texas).

1991. *Gambusia affinis* : Talwar and Jhingian, *Inland Fishes of India and Adjacent Countries*, Vol II: 756.

Material examined : 231 exs., 11.0–30.0 mm. SL., F. 7353, Near Ramasamy pond, 13.09.03, Coll. G. Thirumalai; 200 exs., 15.0–30.0 mm. SL., F. 7401, Jodukonta, 16.03.04, Coll. K. Rema Devi & T.J. Indra; 2 exs., 12.0–13.0 mm. SL., Madeshpura

Koil Kere, 19.03.04, Coll. K. Rema Devi & T.J. Indra.

Distribution : South eastern United States of America : Introduced into India in several states.

20. *Poecilia reticulata* (Peters)

1859. *Poecilia reticulata* Peters, *K. Preussischen akad Wiss., Berlin* : 412 (Type Locality : Venezuela).

1991. *Poecilia reticulata* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries*. Vol. II : 758.

Material examined : 2 exs., 24.0–25.0 mm. SL., F. 7286, Mooleygundi, 15.03.03, Coll. S. Krishnan; 1 ex., 18.0 mm. SL., F. 7305, Udigebandi, 16.03.03, Coll. S. Krishnan; 1 ex., 22.0 mm. SL., Thattekere, 18.03.03, Coll. S. Krishnan; 1 ex., 15.0 mm. SL., Ebella, 14.09.03, Coll. G. Thirumalai; 4 exs., 16.0–24.0 mm. SL., F. 7351, Muthyala maduvu, 15.09.03, Coll. G. Thirumalai; 371 exs., 8.0–19.0 mm. SL., F. 7381, Sebenekere, 16.03.04, Coll. K. Rema Devi & T.J. Indra; 13 exs., 15.0–30.0 mm. SL., F. 7400, Ghaddehalla, 17.03.04, Coll. K. Rema Devi & T.J. Indra; 21 exs., 12.0–35.0 mm. SL., F. 7380, Uruganadoddi, 19.03.04, Coll. K. Rema Devi & T.J. Indra; 734 exs., 13.0–27.0 mm. SL., F. 7359, Golla Halle Selu, 20.03.04, Coll. K. Rema Devi & T.J. Indra; 23 exs., 14.0–34.0 mm. SL., F. 7410, Muthiyala Maduvu, 20.03.04, Coll. K. Rema Devi & T.J. Indra; 18 exs., 11.0–21.0 mm. SL., Bettahalli Kavalu, 23.03.04, Coll. K. Rema Devi & T.J. Indra.

Distribution : Originally from Tropical America. Introduced into India, particularly well established in south India.

Remarks : The Species is not as widely reported as *Gambusia affinis* and is known only from some districts of Andhra Pradesh, Tamil Nadu and Karnataka.

21. *Chanda nama* Hamilton

1822. *Chanda nama* Hamilton–Buchanan, *Fishes of Ganges* : 109, 371, pl.39, fig.37 (Type locality : ponds throughout Bengal).

1971. *Chanda nama* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries*, Vol. II : 799.

Material examined : 97 exs., 26.0–43.0 mm. SL., F. 7291, Thattekere, 18.03.03, Coll. S. Krishnan; 127 exs., 20.0–29.0 mm. SL., Matheswara Kere, 14.09.03, Coll. G. Thirumalai; 20 exs., 17.0–35.0 mm. SL., F. 7407, Madeshpura Koil Kere, 19.03.04, Coll. K. Rema Devi & T.J. Indra.

Distribution : India (Ganga, Krishna, Cauvery and Mahanadi - Basins), Bangladesh, Nepal and Pakistan (Indus).

22. *Parambassis ranga* (Ham.)

1822. *Chanda ranga* Hamilton-Buchanan, *Fishes of Ganges* : 113, 317, pl. 16, fig.38 (Type locality : freshwaters of all parts of Gangetic provinces).
1991. *Parambassis ranga* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries*, Vol. II : 805.

Material examined : 8 exs., 40.0–42.0 mm. SL., F. 7342, Matheswara Kere, 14.09.03, Coll. G. Thirumalai; 1 ex., 52.0 mm. SL., F. 7347, Palankuppai valla, 17.09.03, Coll. G. Thirumalai; 1 ex., 49.0 mm. SL., F. 7382, Hosekere New Tank, Bantanalu, 23.03.04, Coll. K. Rema Devi & T.J. Indra; 1 ex., 22.0 mm. SL., Bettahalli Kavalu, 23.03.04, Coll. K. Rema Devi & T.J. Indra.

Distribution : India, Bangladesh, Malaysia, Myanmar and Pakistan.

23. *Oreochromis mossambica* (Peters)

1852. *Chromis (Tilapia) mossambicus* Peters, *Montab. Akad. Wiss., Berlin* : 681 (Type locality : Mozambique).
1991. *Oreochromis mossambica* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries*. Vol. II : 887

Material examined : 22 exs., 35.0–68.0 mm. SL., F. 6946, Bannerghatta, 12.03.2002, Coll. S. Krishnan; 4 exs., 124.0–140.0 mm. SL., F. 6947, Ellamalappa Kere, Avalahalli, 15.03.2002, Coll. S. Krishnan; 1 ex., 25.0 mm. SL., F. 7287, Mooleygundi, 15.03.03, Coll. S. Krishnan; 4 exs., 21.0–46.0 mm. SL., F. 7298, Gaddhealla, 15.03.03, Coll. S. Krishnan; 23 exs., 14.0–108.0 mm. SL., F. 7292, Thattekere, 18.03.03, Coll. S. Krishnan; 4 exs., 15.0–26.0 mm. SL., Near Ramasamy pond, 13.09.03, Coll. G. Thirumalai; 9 exs., 19.0–125.0 mm. SL., F. 7343, Matheswara Kere, 14.09.03, Coll. G. Thirumalai; 16 exs., 22.0–32.0 mm. SL., F. 7357, Doddannakere, 17.03.04, Coll. K. Rema Devi & T.J. Indra; 23 exs., 8.0–19.0 mm. SL., Sebenekere, 16.03.04, Coll. K. Rema Devi & T.J. Indra; 1 ex., 15.0 mm. SL., F. 7394, Jodukonta, 16.03.04, Coll. K. Rema Devi & T.J. Indra; 43 exs., 18.0–78.0 mm. SL., F. 7397, Ghaddehalla, 17.03.04, Coll. K. Rema Devi & T.J. Indra; 155 exs., 14.0–110.0 mm. SL., F. 7374, Uruganadoddi, 19.03.04, Coll. K. Rema Devi & T.J. Indra; 38 exs., 10.0–35.0 mm. SL., F. 7406, Madeshpura Koil Kere, 19.03.04, Coll. K. Rema Devi & T.J. Indra; 13 exs., 38.0–78.0 mm. SL., F. 7418, Muninagaram, 22.03.04, Coll. K. Rema Devi & T.J. Indra.

Distribution : East Africa to Nepal. Widely introduced in India, Bangladesh, Pakistan and Sri Lanka.

24. *Pseudosphromenus cupanus* (Val.)

1831. *Polyacanthus cupanus* Valenciennes, *Hist. Nat. Poiss.*, 7 : 357 (Type locality : Ariancoupun river at Pondicherry)

1991. *Pseudosphromenus cupanus* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries*. Vol. II: 1002.

Material examined : 40 exs., 24.0–33.0 mm. SL., F. 7358, Doddannakere, 17.03.04, Coll. K. Rema Devi & T.J. Indra.

Distribution : Eastern India, Sri Lanka, Western Burma, Malay Peninsula and Sumatra.

25. *Channa orientalis* (Bloch & Schneider)

1801. *Channa orientalis* Bloch and Schneider, 1801 *Syst. Ichth.*; 496, pl. 90, fig. 2 (Type locality : India)

1991. *Channa orientalis* : Talwar and Jhingran, *Inland Fishes of India and Adjacent Countries*. Vol II: 1019.

Material examined : 3 exs., 95.0–110.0 mm. SL., F. 7365, Uthigabande, 18.03.04, Coll. K. Rema Devi & T.J. Indra.

Distribution : Afghanistan, Iran, Pakistan, India, Nepal, Sri Lanka, Bangladesh, Burma and the East Indies.

26. *Channa punctatus* (Bloch)

1793. *Ophiocephalus punctatus* Bloch, *Naturges. Ausland. Fische*, (7) : 139, pl. 358 (type locality : river and lakes of Coromandel coast.

1991. *Channa punctatus* : Talwar and Jhingran, *Inland Fishes of India and Adjacent countries*, Vol. II : 1020.

Material examined : 2 exs., 55.0–56.0 mm. SL., F. 7352, Muthyala maduvu, 15.09.03, Coll. G. Thirumalai; 46 exs., 18.0–22.0 mm. SL., F. 7354, Athikupae Halle, 17.09.03, Coll. G. Thirumalai.

Distribution : India(throughout), Afghanistan, Bangladesh, China, Malaya, Myanmar, Nepal, Pakistan, Polynesia and Sri Lanka.

SUMMARY

The study of fish specimens from Bannerghatta National Park yielded 26 species belonging to 9 families and 4 orders. Of significance is the collection of a few hill stream species viz. *Danio malabaricus* (Jerdon), *Garra mullya* (Sykes) and *Schistura denisoni denisoni* (Day). Further it was observed that the Gangetic cyprinid *Labeo ariza* (Ham.) is cultured in tanks and were regularly harvested by the locals. This species was first reported by Hora (1942) from Mysore State. Subsequently no collections

could be obtained from the Cauvery river by Jayaram *et al.* (1982). Also *Cirrhinus fulunjee* (Sykes) reported by Hora (1937) and not collected by Jayaram (op. cit.) are represented in several localities within the Park. The collections further include *Esomus barbatus*, *Rasbora caverii* and *Puntius cauveriensis* originally described from Karnataka. A recent report on the fishes of Bangalore and Kolar Districts, Karnataka by Krishnan *et al.* (2004) lists 29 species including two new records. However the present collections from Bannerghatta National Park is significant in the sense that it harbours 15 additional species including hill stream forms not reported from Bangalore.

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AMPHIBIA

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INTRODUCTION

The studies on amphibians in Bannerghatta National Park (BNP) seems to be meager and the available information lies scattered in most earlier works from Karnataka by Rao (1922), Boulenger (1882), Daniel (1963, 1975), Daniels (1997) and Krisnamurthy and Katre (1993).

The present paper deals with 12 species under 8 genera and 4 families of amphibians from BNP collected during faunistic surveys conducted from 2003-2004 by Southern Regional Station, Zoological survey of India and is limited to the anurans.

The paper follows the recent classification by Frost *et al.* (2006) which is totally based on molecular interpretation of evolution of amphibians.

SYSTEMATIC ACCOUNT

Class AMPHIBIA

Order ANURA Fischer

Family BUFONIDAE

Genus *Duttaphrynus* Frost, *et al.*, 2006

1. *Duttaphrynus melanostictus* (Schneider, 1799)

Common Indian Toad

Synonyms : *Bufo melanostictus*, *Bufo bengalensis*, *phrynoides melanostictus*

The toad reaching a length of 160 mm (SVL= Snout to Vent Length); the females larger than males; Poisonous glands and conical warts present throughout the ventral region. The tympanum is distinct.

Habitat : They are found abundantly in both dry and damp areas and widely distributed throughout India.

Status : Least Concern (LC).

Materials Examined : Ramaswamy pond- Lot 1, 2 exs, 03.09.2003, G. Thirumali & party; Lot 5, 1ex, 12.09.2004, G. Thirumali & party; Lot 2, 1ex, 14.09.2004, G. Thirumali & party; Lot 2, 1ex, 16.03.2004, K. Rema Devi & party; Lot 6, 6 exs, 17.03.2004, K. Rema Devi & party ; Lot 5, 1ex, 20.03.2004, K. Rema Devi & party.

Remarks : Frost *et al.*, (2006) transferred the species from *Bufo* to a new genus *Duttaphrynus* as the molecular data interprets deviation in their phylogeny from the true *Bufo*.

2. *Bufo* stomaticus* Lütken, 1864 Marbled toad

Synonyms : *Bufo andersonii*

Medium to large size; dorsal texture marbled; ventral body is white. Adults reach a length of 90 mm (SVL). The tympanum is as large as the eye.

Habitat : They are found mostly in dry habitats and distributed up to 1000m ASL (Above Sea level).

Status : Least Concern (LC).

Materials Examined : Udugebande- Lot 1, 2 exs, 11.09.2003, G. Thirumali & party; Lot 2, 2 exs, 14.09.2003, G. Thirumali & party; Lot 3, 1ex, 15.09.2003, G. Thirumali & party; Lot 2, 1ex, 16.03.2004, K. Rema Devi & party.

Remarks : * The genus has to be reviewed in the light of the publication of Frost *et al.*, 2006 which states about the molecular/phylogenetic deviation from true *Bufo* accommodating the species in the “*Pseudepidalea*” group of Bufonidae.

Family MICROHYLIDAE

Subfamily MICROHYLINAE

Genus *Microhyla* Tschudi, 1838

3. *Microhyla ornata* (Duméril and Bibron, 1841) Ornate Microhylid

Synonyms : *Engystoma carnaticum*, *Engystoma malabaricum*

Small frog; bronze coloured with a band running through the sides from eyes, SVL reaches up to 25 mm; pointed snout; tympanum visible.

Habitat : Throughout the forest vegetation and found up to 1500 m ASL. Mainly found in temporary rain water pools, dry litter and open grassy areas during monsoon.

Status : Least Concern (LC).

Materials Examined : Swarnamathi beat- Lot 5, 1ex, 12.09.2004, G. Thirumali & party; Lot 6, 3exs, 17.03.2004, K. Rema Devi & party; Lot 3, 6 exs, 17.03.2004, K. Rema Devi & party.

4. *Microhyla rubra* (Jerdon, 1854)
Red Microhylid

Synonyms : *Engystoma rubrum*

Small microhylid with 26 mm SVL. Dorsal reddish brown with median brown longitudinal bands between eyes. Head broader than long, snout blunt. Nostrils closer than to tips of the snout than the eye.

Habitat : Found near torrential brooks, river edges and on banks during monsoon.

Status : Least Concern (LC).

Materials Examined : Swarnamathi beat Lot 5, 1ex, 12.09.2004, G. Thirumali & party.

Family DICROGLOSSIDAE
Subfamily DICROGLOSSINAE

Genus *Euphlyctis* Fitzinger, 1843

5. *Euphlyctis cyanophlyctis* (Schneider, 1799)
Skipper frog

Synonyms : *Rana cyanophlyctis*, *Occidozyga cyanophlyctis*

Medium sized frog, mostly found in stagnant waters, water bodies and torrential streams, camouflaged to its surroundings. SVL reaches to 60mm. Females is larger than the males. Tympanum visible and hind limb fully webbed.

Habitat : They are found in almost all terrestrial water bodies, commonly in rice fields, irrigation canals and stagnant water bodies.

Altitude : Sea level to 1500m.

Status : Least Concern (LC).

Materials Examined : Swarnamathi beat- Lot 5, 1ex, 12.09.2004, G. Thirumali & party; Lot 2, 1ex, 16.03.2004, K. Rema Devi & party; Lot 9, 1ex, 18.03.2004, K. Rema Devi & party; Lot 8, 1ex, 18.03.2004, K. Rema Devi & party; Lot 3, 7exs, 19.03.2004, K. Rema Devi & party; Lot 3, 12 exs, 19.03.2004, K. Rema Devi & party; Lot 8, 3 exs,

21.3.2004, K. Rema Devi & party; Lot 1, 9 exs, 22.03.2004, K. Rema Devi & party; Lot 2, 3exs, 22.03.2004, K. Rema Devi & party; Lot 4, 2 exs, 23.03.2004, K. Rema Devi & party; Lot 6, 7exs, 23.03.2004, K. Rema Devi & party; Lot 4, 3 exs, 23.03.2004, K. Rema Devi & party; Lot 3, 2 exs, 24.03.2004, K. Rema Devi & party; Lot 2, 13 exs, 24.03.2004, K. Rema Devi & party.

Remarks : The genus *Euphlyctis* has been excluded from the family Ranidae and placed in the family Dicroglossidae by Frost *et al.*, 2006.

6. *Euphlyctis hexadactylus* (Lesson, 1834)

Pond frog

Synonyms : *Rana hexadactyla*, *Occidozyga hexadactyla*

The frogs are medium to large sized, measures maximum of 120 mm (SVL). Tympanum is distinct and the first finger is slightly longer than the second. The hind limb is fully webbed.

Habitat : Mostly found in the stagnant waters and ponds.

Altitude : Up to 700m ASL.

Status : Least Concern (LC).

Materials Examined : Betthalli Kaublu- Lot, 6, 3exs, 23.03.2004, K. Rema Devi & party.

Genus *Fejervarya* Bolkey, 1915

7. *Fejervarya limnocharis* (Gravenhorst, 1829)

Paddy field Frog

Synonyms : *Rana limnocharis*, *Limnonectes limnocharis*, *Limnonectes (Fejervarya) limnocharis*.

Small frogs reaching a length of 50 mm (SVL). The males are smaller than the female, Snout is pointed and tympanum is about 2/3 diameter of the eye.

Habitat : They inhabit stagnant waters (Paddy fields, small ponds) and slow running streams in forests.

Altitude : Sea level to 1000 m MSL.

Status : Least Concern (LC).

Materials Examined : Swarnamathi beat- Lot 5, 2exs, 12.09.2004, G. Thirumali & party; Lot 5, 6exs, 12.09.2004, G. Thirumali & party; Lot 2, 1ex, 14.09.2004, G. Thirumali & party; Lot 6, 31 exs, 17.03.2004, K. Rema Devi & party; Lot 6, 7exs,

17.03.2004, K. Rema Devi & party; Lot 3, 13exs, 17.03.2004, K. Rema Devi & party; Lot 3, 29exs, 17.03.2004, K. Rema Devi & party; Lot 9, 9exs, 18.03.2004, K. Rema Devi & party; Lot 8, 1exs, 18.03.2004, K. Rema Devi & party; Lot 2, 1ex, 19.03.2004, K. Rema Devi & party; Lot 5, 5exs, 20.03.2004, K. Rema Devi & party.

Remarks : The genus *Fejervarya* has been excluded from the family Ranidae and placed in the family Dicroglossidae by Frost *et al.*, 2006.

8. *Fejervarya keralensis* (Dubois, 1981)
Kerala Warty frog

Synonyms *Rana keralensis*, *Limnonectes keralensis*, *Limnonectes (Fejervarya) keralensis*.

This frog reaches to 55mm (SVL) and females are larger than males. The tympanum is distinct and is equal to the eye. The nostrils are closer to tip of eye.

Habitat : They are found mostly in forest and hilly streams and also in stagnant waters and pools.

Altitude : Sea level to 1500m ASL.

Status : Least Concern (LC).

Materials Examined : Muthyala Maduvu - Lot 3, 1ex, 15.09.2003, G. Thirumali & party; Lot 1, 1ex, 17.09.2003, G. Thirumali & party.

Genus *Hoplobatrachus* Peters, 1863

9. *Hoplobatrachus tigerinus* (Daudin, 1802)
Indian Bull frog

Synonym : *Rana tigerina*

Large sized frog found in the edges of the streams with an average length SVL of 15mm. The snout is distinct and pointed and tympanum is distinct.

Habitat : This species is mostly found in forests near streams during day and night.

Altitude : Distributed from plains to 2000m ASL.

Status : Least Concern (LC).

Materials Examined : Athikupal halli - Lot 1, 1ex, 17.09.2003, G. Thirumali & party.

Remarks : The genus *Hoplobatrachus* has been excluded from the family Ranidae and placed in the family Dicroglossidae by Frost *et al.*, 2006.

Genus *Sphaerotheca* Günther, 1858

10. *Sphaerotheca breviceps* (Schneider, 1799)
Clumsy burrowing frog

Synonyms : *Rana breviceps*, *Tomopterna breviceps*.

Medium sized burrowing frogs, the adult reaching a length of 65 mm (SVL). The females are larger than the males; tympanum distinct and 2/3 diameter of the eye. A large shovel like inner metatarsal present on the toe.

Habitat : They are widely distributed in the open forest.

Altitude : Mostly from plains to 500m MSL.

Status : Least Concern (LC).

Materials Examined : Madeshpur koilkera- Lot 2, 1ex, 19.03.2004, K. Rema Devi & party.

11. *Sphaerotheca rolandae* (Dubois, 1983)
Roland's Burrowing frog

Synonyms : *Rana (Tomopterna) rolandae*, *Tomopterna rolandae*.

Small sized frog with a maximum of 40 mm (SVL). Snout is short and blunt and tympanum is distinct

Habitat : They are found almost in all habitats from forests to urban lands.

Altitude : Mostly from plains to 500 m MSL.

Status : Least Concern (LC).

Materials Examined : Ramaswamy pond - Lot 1, 1ex, 03.09.2003, G. Thirumali & party.

Remarks : The genus *Sphaerotheca* has been excluded from the family Ranidae and placed in the family Dicroglossidae by Frost *et al.*, 2006.

Family MICRIXALIDAE

Genus *Micrixalus* Boulenger, 1888

12. *Micrixalus fuscus* (Boulenger, 1882)
Dusky Torrent frog

Synonyms : *Micrixalus herrei*, *Ixalus fuscus*.

The torrent frog is small in size reaching a maximum length of 30 mm (SVL). The toes are $\frac{3}{4}$ webbed. A thin fold is seen along the side of the abdomen.

Habitat : Usually found in rocks in the middle of streams in both evergreen and semi evergreen forests. Some times it may be seen on moist forest floor among leaves.

Altitude : 200-750 m MSL.

Status : Near Threatened (NT).

Materials Examined : Seekakhatta- Lot 3, 1ex, 17.03.2004, K Rema Devi & party.

Remarks : The species has been assigned into a different family Micrixalidae by Dubois *et al.*, 2001 due to the significant variations from Ranidae.

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REPTILIA

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INTRODUCTION

Daniels (2000) reported the occurrence of 93 species of reptiles in the Karnataka state. Our knowledge on the reptilian fauna of Bannerghatta National Park (BNP) pertains to 53 species as reported by Sharma (1972) and Rajeev (1996 & 2002).

Based on the collections and observations made by the survey parties of the Zoological Survey of India during the years 2003-2005, 14 species could be identified. 7 of them are new records for the Park. A list of 60 species (the 7 newly recorded and the 53 already reported from BNP) known till date from the Park is presented in Table: 1.

Abbreviations : SL- -- Shell Length; SVL - Snout to Vent Length; TL - Length of Tail; L –Total length; Coll – Collector / Collected by.

SYSTEMATIC LIST

Phylum CHORDATA
Class REPTILIA
Order LORICATA
Family CROCODILIDAE

1. *Crocodylus palustris* Lesson

Order CHELONIA
Suborder CRYPTODIRA
Family TRIONYCHIDAE

2. *Lissemys punctata granosa* (Schoepff)

Order SQUAMATA
 Suborder SAURIA
 Family GEKKONIDAE

3. *Cyrtodactylus dekkanensis* (Gunther)
4. *Cnemaspis indica* (Gray)
5. *Hemidactylus frenatus* Schlegel (in Dum. & Bibr.)
6. *Hemidactylus triedrus* (Daudin)
7. *Hemidactylus brooki* (Gray)

Family AGAMIDAE

8. *Sitana ponticeriana* (Cuvier)
9. *Calotes versicolor* (Daudin)
10. *Psammophilus dorsalis* (Gray)

Family SCINCIDAE

11. *Mabuya carinata* (Schneider)

Family LACERTIDAE

12. *Ophisops jerdoni* Blyth

Suborder SERPENTES

Family TYPHLOPIDAE

13. *Ramphotyphlops braminus* (Daudin)
14. *Typhlops porrectus* Stoliczka

SYSTEMATIC ACCOUNT

1. *Crocodylus palustris* Lesson Marsh crocodile

1834. *Crocodylus palustris* Lesson, in Belang *Voy. Ind. Or., Zool.*, 305.

Diagnosis : Snout in adult $1\frac{1}{3}$ to $1\frac{1}{2}$ times as long as broad at the base, usually without ridges in front of the eye, if present extend only for a short distance. Body strongly armoured and four large nuchals forming a square with a smaller one on each side of the nape. Dorsal scute about 17 transverse rows and 6 longitudinal series. The adults olive brownish above and whitish below with prominent dark spots

Locality of observation : Bison pond of Bannerghatta National Park.

Distribution : Throughout peninsular India. Elsewhere: Bangladesh, Iran, Nepal, Pakistan and Sri Lanka.

Remarks : Field observation only.

2. *Lissemys punctata granosa* (Schoepff)
Southern Flapshelled turtle

1792. *Testudo granosa* Schoepff, *Hist. Test*, 127, pls. xxx A & B.

1931. *Lissemys punctata granosa* Smith, *Fauna of British India* , 1 : 158.

Material examined : 1 ex., (SL. 60 mm), Athikupahalli, 17.ix.2003, Coll., G. Thirumalai,

Diagnosis : Presence of skin flaps on the plastron for hiding the hind limbs and the tail. Carapace more or less oval and covered with smooth skin which have plaited appearance in the young. Front and the back margins of the shell can be bent down to completely hide the retracted head & limbs. Digits fully webbed and the tail short. Plastron with seven callosities.

Distribution : Peninsular India.

Elsewhere : Sri Lanka

3. *Cyrtodactylus dekkanensis* (Gunther)
Deccan Rock gecko

1864. *Gymnodactylus dekkanensis* Gunther, *Rept. Brit. Ind.*, 115.

1990. *Cyrtodactylus dekkanensis*, Murthy, *Rec. zool. Surv. India, Occ. Pap. No.*, 115 : 9.

Material examined : 1 ex., (SVL. 36 mm; Tail damaged), Mathesurakere, 14.ix.2003, G. Thirumalai, Coll.; 1 ex., (SVL. 32 mm; TL. 38 mm), Ebola, Antharagangavallae, 14.ix.2003, G. Thirumalai, Coll.

Diagnosis : Head covered with moderately small rounded scales which become larger and conical in shape upon the nape. Reddish brown above with white, brown edged transverse bars upon the back and tail. A curved mark upon the nape extending to the eyes. Ventral side of the body is whitish.

Distribution : INDIA: Western Ghats part of Karnataka and Maharashtra.

4. *Cnemaspis indica* (Gray)
Nilgiri Dwarf gecko

1846. *Goniiodactylus indicus* Gray. *Ann. Mag. Nat. His.*, 18 : 429.

1985. *Cnemaspis indica* Murthy. *Rec. zool. Surv. India, Occ. Pap. No.*, 72 : 19.

Material examined : 1 ex., (SVL. 26 mm; Tail damaged), Thammanayakanahalli, 10.xii-2005. S. Prabakaran, coll.

Diagnosis : Body greenish brown with a row of orange yellowish spots traversed from the head to tail and also a similar spots traversing in the lateral side of the body. A light vertebral line is present.

Distribution : INDIA : Tamil Nadu : Nilgiris, Karnataka : Coorg. This is the commonest forest gecko of Nilgiris.

Remarks : Found in decaying organic matter near rocks.

5. *Hemidactylus frenatus* Schlegel (in Dum. & Bibr.) Southern House gecko

1836. *Hemidactylus frenatus* Schlegel, in Dum. & Bibr. *Erp. Gen.* 3 : 366.

Material examined : 2 exs., (SVL. 35–40 mm; Tail damaged), Swarnamuki beat, 12.ix.2003, G. Thirumalai, Coll.

Diagnosis : Dark brownish dorsally with distinct darker marking often arranged as longitudinal stripes on the back and whitish below; Head marked with dark and light lines; Tail coral red.

Distribution : INDIA : Peninsular India, West Bengal, Andaman and Nicobar Islands.

Elsewhere : Bangladesh.

Remarks : Found under the bark of the Eucalyptus trees.

6. *Hemidactylus triedrus* (Daudin) Termite Hill gecko

1802. *Gecko triedrus* Daudin, *Hist. Nat. Rept.*, 4 : 155

1935. *Hemidactylus triedrus* Smith, *Fauna of British India* 2 : 88.

Material examined : 1 ex., (SVL. 48 mm; Tail damaged), Urugunthoddai 19.iii.2004, K. Remadevi, Coll.

Diagnosis : Head rather large and the snout obtusely pointed. Body heavily tuberculated and it can be easily recognized by three white edged olive green cross bars and pinkish white below. Tail marked with regular black and light rings.

Distribution : INDIA : Tamil Nadu, Andhra Pradesh, Karnataka, Kerala and Maharashtra.

Elsewhere : Sri Lanka, West Pakistan.

Remarks : Found under the stone piles.

7. *Hemidactylus brooki* Gray
Spotted Indian House gecko

1845. *Hemidactylus brooki* Gray, *Cat, Liz Brit., Mus.* : 153.

Material examined : 1 ex., (SVL. 34 mm; TL. 43 mm), Ebdla Antharagangvallae, 14.ix.2003. G. Thirumalai, Coll. 4 exs., (SVL 28–55 mm; TL 30–55mm), Kagglahalli, Harohalli range 11.xii.2005 S. Prabakaran, Coll.

Diagnosis : Found to be light grey above, with dark brown spots more or less regularly arranged somewhat like broken transverse bands on the back. The dark streak along the side of the head and dirty whitish below.

Distribution : The whole of India.

Elsewhere : Sri Lanka and known from Borneo and South China through most of tropical Asia and North Africa.

8. *Sitana ponticeriana* Cuvier
Fan Throated lizard

1844. *Sitana ponticeriana* Cuvier, *Icon. Reg. Anim.Rept.* pl. 9. fig. 2.

Material examined : 1 ex., (SVL. 22 mm; TL. 40 mm), Swarnamuki beat, 12.ix.2003 G. Thirumalai, Coll. 1 ex., (SVL. 35 mm; TL. 60 mm), Uruganthoddai, 19.iii.2004 K. Rema Devi, Coll.

Diagnosis : Body compressed light brown above with series of dark brown, black-edged rhomboidal spots along the middle of the back; a distinct light line along each side of the spots, the ventral side whitish; Tail round and slender and covered with equal keeled scales.

Distribution : The whole of India.

Elsewhere : Sri Lanka.

9. *Calotes versicolor* (Daudin)
Indian Garden lizard.

1802. *Agama versicolor* Daudin, *Hist. Nat. Rept.* 3 : 395, pl. 44.

1935. *Calotes versicolor*, Smith, *Fauna of British India*, 2 : 189

Material examined : 1 ex., (SVL. 35 mm; TL. 55 mm), Athikupae halli, 17.ix.2003 G. Thirumalai, Coll. 1 ex., (SVL. 85 mm; TL. 195 mm), Malenallasandara, 10.xii, 2005

S.Prabakaran, coll. 2 exs., (SVL 40–50 mm; TL 100–110 mm), Gabbradikere, 11.xii.2005 S. Prabakaran, coll.

Diagnosis : Body compressed, dorsal scales strongly keeled and more or less larger than ventrals, two well-separated spines on each side of the back of the head above the ear; Body greyish brown above with dark transverse bars; Tail marked with light and dark bands.

Distribution : INDIA : Throughout India.

Elsewhere : Sumatra to South-China, Sri Lanka, Pakistan and Afghanistan.

10. *Psammophilus dorsalis* (Gray) South Indian rock lizard

1831. *Agama dorsalis* Gray, in Griffith's *Anim.King.*, 9 : 56.

1935. *Psammophilus dorsalis*, Smith, *Fauna of British India*, 2 : 209.

Material examined : 1ex., (SVL. 100; TL. 170 mm), Udugubandu, 11.ix.2003, G. Thirumalai, Coll. 2 exs., (SVL 70–115 mm; TL 150–170 mm), Uruganthottai, Thattekere 19.iii.2004, K. Rema Devi, Coll. 1 ex., (SVL.35 mm; TL. 40 mm), Udugubandu, 9.xii.2005, S. Prabakaran, coll. 1 ex., (SVL. 45 mm; Tail damaged), Malenallasndara, 10.xii.2005, S. Prabakaran, coll.

Diagnosis : Body depressed, dorsal crest absent; ventral scales as large as the dorsals male brownish on the top of the head and back, lips yellowish. Young and females olive brown with a distinct series of white elongated spots on the back, under side yellow; Tail long and slender.

Distribution : Hilly terrains of South India.

11. *Mabuya carinata* (Schneider) Common skink

1801. *Scincus carinatus* Schneider, *Hist. Amph.*, 2 : 183.

1935. *Mabuya carinata*, Smith, *Fauna of British India*, 2 : 266.

Material examined : 1ex., (SVL. 80 mm; Tail damaged), Gabbadikeri; Harohalli range, 11.xii.2005, S. Prabakaran coll.

Diagnosis : Dorsal and lateral scales subequal, Head with enlarged scales arranged symmetrically; body robust covered with cycloid imbricate scales. lower eye-lid scaly; dorsum bronzy, sides darker, body characterised by two prominent dorso-lateral stripes one starting from above the eye and extending to the tail and a second starting from the upper lip and extending to the groin; underside yellow.

Distribution : INDIA : Peninsular India, Assam and Bengal.

Elsewhere : Sri Lanka and Nepal.

12. *Ophisops jerdoni* Blyth
Snake-eyed lacerta

1853. *Ophisops jerdonii* Blyth, *J. Asiat. Soc. Beng.*, **22** : 653.

1935. *Ophisops jerdoni*, Smith, *Fauna of British India*, **2** : 377.

Material examined : 1 ex., (SVL. 45 mm; TL. 95 mm), Udugubandu, 9.xii.2005 S. Prabakaran, coll.

Diagnosis : A fold in front of the shoulder, dark olive above and whitish below; two lemon coloured stripes on the flanks which enclose dark transverse in the middle zone of the back.

Distribution : INDIA : Andhra Pradesh, Maharashtra, Cutch, Madhya Pradesh, Rajasthan and Tamil Nadu.

Elsewhere : Pakistan.

13. *Ramphotyphlops braminus* (Daudin)
Common Blind snake

1803. *Eryx braminus* Daudin, *Hist. Nat. Rept.*, **7** : 279.

1990. *Ramphotyphlops braminus*, Murthy, *Rec. zool. Surv. India, Occ. Pap.*, **114** : 5.

Material examined : 1 ex., (L. 115 mm), Near Ramasamy pond, 13.ix.2003, G. Thirumalai, Coll.; 1 ex., (L. 73 mm), Mathesware kare, 14.ix.2003, G. Thirumalai, Coll.; 1 ex., (L. 100 mm) Thammanyakanahalli 10.xii.2005 S. Prabakaran, coll.

Diagnosis : Snout rounded and strongly projecting. chestnut brown, above and paler below, snout, chin and anal region creamy; tail short and ending with a spine.

Distribution : Throughout India, including Andaman and Nicobar Islands and the Lakshadweep.

Remarks : Found under the stones.

14. *Typhlops porrectus* Stoliczka
Slender Blind snake

1871. *Typhlops porrectus* Stoliczka, *J.A.S, Bengal*, **xl** : 426.

Material examined : 1ex., (L. 105 mm), Kagglahalli; Harohalli range, 11.xii.2005, S. Prabakaran coll.

Diagnosis : Blackish brown above and paler below; snout rounded strongly projecting and the chin and anal region white.

Distribution : Throughout India.

SUMMARY

The paper deals with reptilian fauna of Bannerghatta National Park based on the collections and observations made by the survey parties of the Zoological Survey of India during the year 2003-2005. Although 93 species of reptiles are known to occur in Karnataka state, 53 species have been reported from Bannerghatta National Park earlier. With the addition of 7 more species (*Cyrtodactylus dekkensis*, *Cnemaspis indica*, *Hemidactylus frenatus*, *Calotes versicolor*, *Ophisops jerdoni*, *Ramphotyphlops braminus* and *Typhlops porrectus*) during the ZSI surveys, the total goes upto 60 species. Two species of Geckos *Cnemaspis indica* and *Cyrtodactylus dekkensis* known to be endemic to Western Ghats are reported from Bannerghatta, extending the range.

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Table-1 : Check list of Reptiles of Bannerghatta National Park, Karnataka.

Class REPTILIA

Order SQUAMATA

Suborder SAURIA

Family GEKKONIDAE

- | | |
|------------------------|---|
| 1. Deccan rock gecko | <i>Cyrtodactylus dekkanensis</i> (Gunther) |
| 2. Nilgiri dwarf gecko | <i>Cnemaspis indica</i> (Gray) |
| 3. Kandy dwarf gecko | <i>Cnemaspis kandiana</i> (Kelaart) |
| 4. Mysore dwarf gecko | <i>Cnemaspis mysoriensis</i> (Jerdon) |
| 5. House gecko | <i>Hemidactylus brooki</i> Gray |
| 6. Blotched gecko | <i>Hemidactylus triedrus</i> (Daudin) |
| 7. Souther house gecko | <i>Hemidactylus ftenatus schlegel</i> (in D.& B.) |

Family AGAMIDAE

- | | |
|------------------------------|--|
| 8. Indian garden lizard | <i>Calotes versicolor</i> (Daudin) |
| 9. Dwarf rock lizard | <i>Psammophilus blanfordanus</i> (Stoliczka) |
| 10. South Indian rock lizard | <i>Psammophilus dorsalis</i> (Gray) |
| 11. Fan-throated lizard | <i>Sitana ponticeriana</i> Cuvier |

Family SCINCIDAE

- | | |
|--------------------------------|---|
| 12. Common skink | <i>Mabuya carinara</i> (Schneider) |
| 13. Five-lined mabuya | <i>Mabuya trivittata</i> (Hardwicke & Gray) |
| 14. White-spotted garden skink | <i>Riopa albopunctata</i> (Gray) |
| 15. Common dotted garden skink | <i>Riopa punctata</i> (Linn.) |

Family LACERTIDAE

- | | |
|-----------------------------------|--|
| 16. Snake-eyed lacerta | <i>Ophisops jerdoni</i> Blyth |
| 17. Beddome's snake eyed lacertid | <i>Ophisops beddomei</i> (Jerdon) |
| 18. Leschenault's cabrita | <i>Cabrita leschenaultia</i> (Milne-Edwards) |
| 19. Monitor lizard | <i>Varanus bengalensis</i> (Linn.) |

Family CHAMAELEONIDAE

- | | |
|----------------|--------------------------------------|
| 20. Chamaeleon | <i>Chamaeleo zeylanicus</i> Laurenti |
|----------------|--------------------------------------|

Order SERPENTES

Family TYPHLOPIDAE

- | | |
|-------------------------|---|
| 21. Common blind snake | <i>Ramphotyphlops braminus</i> (Daudin) |
| 22. Slender blind snake | <i>Typhlops porrectus</i> Stoliczka |

Family UROPELTIDAE

23. Elliot's uropeltis

Uropeltis ellioti (Gray)

24. Nilgiri uropeltis

Uropeltis ocellatus (Beddome)

Family BIODAE

25. Rock python

Python molurus molurus (Linn.)

26. Common sand boa

Eryx conicus (Schneider)

27. Red sand boa

Eryx johani (Boulenger)

Family COLUBRIDAE

Subfamily COLUBRINAE

28. Olive keelback watersnake

Atretium schistosum (Daudin)

29. Rat snake

Ptyas mucosus (Linn.)

30. Green keelback

Macropisthodon plumbicolor (Cantor)

31. Checkered keelback

Xenochrophis piscator (Schneider)

32. Common green whip snake

Ahaetulla nasuta (Lacepede)

33. Beddome's keelback

Amphiesma beddomei (Gunther)

34. Green keelback

Amphiesma monticola (Jerdon)

35. Striped keelback

Amphiesma stolata (Linn.)

36. Banded racer

Argyrogena fasciolatus (Shaw)

37. Forsten's cat snake

Boiga forsteni (Dum & Bib)

38. Common cat snake

Boiga trigonata trigonata (Schneider)

39. Golden tree/ flying snake

Chrysopelea ornata (Shaw)

40. Painted bronzeback tree snake

Dendrelaphis pictus (Boulenger)

41. Indian bronzeback tree snake

Dendrelaphis tristis (Daudin)

42. Common trinket snake

Elaphe helena (Daudin)

43. Lesser stripednecked snake

Liopeltis calamaria (Gunther)

44. Wolf snake

Lycodon aulicus aulicus (Linn.)

45. Barred wolf snake

Lycodon striatus (Stoliczka)

46. Common/banded kukri snake

Oligodon arnensis (Shaw)

47. Russel's/ kukri snake

Oligodon taeniolatus (Jerdon)

Family ELAPIDAE

48. Common cobra

Naja naja naja (Linn.)

49. King Cobra

Ophiophagus hannah (Cantor)

50. Krait

Bungarus caeruleus (Schneider)

- | | |
|--|--|
| 51. Bibron's coral snake | <i>Calliophis bibroni</i> (Jan) |
| 52. Slender coral snake | <i>Calliophis melanurus</i> (Shaw) |
| Family VIPERIDAE | |
| Subfamily VIPERINAE | |
| 53. Russel's viper | <i>Vipera russelli russelli</i> (Shaw) |
| Subfamily CROTALINAE | |
| 54. Malabar pit viper | <i>Trimeresurus malabaricus</i> (Jerdon) |
| Order LORICATA | |
| Family CROCODYLIDAE | |
| 55. Marsh crocodile | <i>Crocodylus palustris</i> (Lesson) |
| Order TESTUDINES | |
| Suborder ATHECAE | |
| Superfamily CRYPTODIRA | |
| Family EMYDIDAE | |
| 56. Travancore vegetable eating turtle | <i>Melanochelys trijuga coronata</i> (Anderson) |
| 57. Indian snail eating turtle | <i>Melanochelys trijuga trijuga</i> (Schweigger) |
| Family TESTUDINIDAE | |
| 58. Star tortoise | <i>Geochelone elegans</i> (Schoepff) |
| 59. Burmese brown tortoise | <i>Geochelone emys</i> (Schlegel & Muller) |
| Family TRIONYCHIDAE | |
| 60. Southern flap-shelled turtle | <i>Lissemys punctata granosa</i> (Schoepff) |

AVES

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INTRODUCTION

The avian fauna of Bannerghatta National Park (BNP) remains to be studied in detail though some records are available on sightings by Karthikeyan (2003) and Islam & Rahmani (2004). BNP is part and parcel of the urban environment of Bangalore city, and George (1994) has provided a checklist of birds pertaining to the city. The biome-wise distribution is reported by Islam & Rahmani (2004) with all essential information on IUCN categorization, threats and other factors but the infobase has to be updated.

We present here a list of avian species occurring in the Park, based both on our survey observations from 2002 to 2004 and scientific literature (Table-1).

Table-1 : Aves of Bannerghatta National Park

S. No.	Scientific Name	Common Name	Endemic Status	Threat Status	Legal Status
1.	<i>Accipiter badius</i> (Gmelin)	Shikra			S-I
2.	<i>Acridotheres fuscus</i> (Wagler)	Jungle Myna			
3.	<i>Acridotheres tristis</i> (Linnaeus)	Indian Myna			
4.	<i>Acrocephalus dumetorum</i> Blyth	Blyth's Reed Warbler			
5.	<i>Acrocephalus stentoreus</i> (Jerdon)	Indian Great Reed - Warbler			
6.	<i>Aegithina tiphia</i> (Linnaeus)	Iora			
7.	<i>Alcedo atthis</i> (Linnaeus)	Small Blue Kingfisher			S-IV
8.	<i>Alcippe poioicephala</i> (Jerdon)	Nilgiri Quaker Babbler			
9.	<i>Amaurornis phoenicurus</i> (Pennant)	White-breasted Waterhen			S-IV

10.	<i>Anas acuta</i> Linnaeus	Pintail			S-IV
11.	<i>Anas crecca</i> Linnaeus	Common Teal			S-IV
12.	<i>Anas poecilorhyncha</i> Forster	Spot – bill Duck			S-IV
13.	<i>Anhinga melanogaster</i> (Pennant)	Indian Darter or Snake Bird		NT	S-IV
14.	<i>Anthus hodgsoni</i> Richmond	Indian Tree Pipit			S-IV
15.	<i>Anthus richardi</i> Vieillot	Richard's Pipit			S-IV
16.	<i>Anthus rufulus</i> (Vieillot)	Paddy-field Pipit			S-IV
17.	<i>Apus affinis</i> (J. E. Gray)	House Swift			
18.	<i>Apus melba</i> Koelz	Alpine Swift			
19.	<i>Aquila clanga</i> Pallas	Greater Spotted Eagle		VU	S-I
20.	<i>Aquila rapax</i> (Temminck)	Indian Tawny Eagle			S-I
21.	<i>Ardea alba</i> Linnaeus	Large Egret			
22.	<i>Ardea cinerea</i> Linnaeus	Grey Heron			S-IV
23.	<i>Ardeola grayii</i> (Sykes)	Pond Heron			S-IV
24.	<i>Artamus fuscus</i> Vieillot	Ashy Swallow Shrike			
25.	<i>Athene brama</i> (Temminck)	Spotted Owlet			S-IV
26.	<i>Bubo bubo</i> (Linnaeus)	Indian Great-horned Owl			S-IV
27.	<i>Bubo zeylonensis</i> (Gmelin)	Brown Fish Owl			S-IV
28.	<i>Bubulcus ibis</i> (Linnaeus)	Cattle Egret			S-IV
29.	<i>Burhinus oedicnemus</i> (Linnaeus)	Stone Curlew			S-IV
30.	<i>Butastur teesa</i> (Franklin)	White-eyed Buzzard			S-IV
31.	<i>Caprimulgus affinis</i> Franklin	Franklin's Nightjar			S-IV
32.	<i>Caprimulgus atripennis</i> Jerdon	Jerdon's Nightjar			
33.	<i>Caprimulgus asiaticus</i> (Latham)	Common Indian Nightjar			S-IV
34.	<i>Caprimulgus indicus</i> Latham	Indian Jungle Nightjar			S-IV
35.	<i>Caprimulgus macrurus</i> Jerdon	Long-tailed Nightjar			S-IV
36.	<i>Carpodacus erythrinus</i> (Pallas)	Rose Finch			S-IV
37.	<i>Centropus bengalensis</i> (Gmelin)	Lesser Coucal			
38.	<i>Centropus sinensis</i> (Stephen)	Crow Pheasant			S-IV

39.	<i>Ceryle rudis</i> (Linnaeus)	Pied Kingfisher			S-IV
40.	<i>Charadrius dubius</i> (Scopoli)	Little Ringed Plover			S-IV
41.	<i>Chloropsis aurifrons</i> (Temminck)	Goldfronted Leafbird			
42.	<i>Chloropsis cochinchinensis</i> (Gmelin)	Goldmantled Leafbird			
43.	<i>Chrysomma sinense</i> (Gmelin)	Yellow-eyed Babbler			
44.	<i>Ciconia episcopus</i> (Boddaert)	Wooly- necked Stork			S-IV
45.	<i>Circaetus gallicus</i> (Gmelin)	Short-toed Eagle			S-I
46.	<i>Circus macrourus</i> (S. G. Gmelin)	Pallid Harrier		NT	S-I
47.	<i>Clamator jacobinus</i> (Boddaert)	Pied Crested Cuckoo			S-IV
48.	<i>Collocalia unicolor</i> (Jerdon)	Indian Edible-nest Swiftlet			
49.	<i>Columba elphinstonii</i> (Sykes)	Nilgiri Wood Pigeon	Endemic to WG	VU	S-IV
50.	<i>Columba livia</i> Gmelin	Blue Rock Pigeon			S-IV
51.	<i>Copsychus saularis</i> (Linnaeus)	Magpie Robin			
52.	<i>Coracias benghalensis</i> (Linnaeus)	Blue Jay/Indian roller			S-IV
53.	<i>Coracina melanoptera</i> (Strickland)	Black-headed Cuckoo Shrike			S-IV
54.	<i>Coracina novaehollandiae</i> (Gmelin)	Large Cuckoo Shrike			
55.	<i>Corvus macrorhynchos</i> Sykes	Jungle Crow			
56.	<i>Corvus splendens</i> (Vieillot)	House Crow			
57.	<i>Coturnix coturnix</i> (Linnaeus)	Common or Grey Quail			
58.	<i>Cuculus varius</i> Vahl	Common Hawk Cuckoo			
59.	<i>Culicicapa ceylonensis</i> (Swainson)	Grey-headed Flycatcher			
60.	<i>Dendrocitta vagabunda</i> Whistler & Kinnear	Rufous Treepie			
61.	<i>Dendrocygna javanica</i> (Horsefield)	Whistling Lesser Teal			S-IV

62.	<i>Dendronanthus indicus</i> (Gmelin)	Forest Wagtail			S-IV
63.	<i>Dicaeum concolor</i> Jerdon	Plain Flowerpecker			
64.	<i>Dicaeum erythrorhynchos</i> (Latham)	Tickell's Flowerpecker			
65.	<i>Dicrurus adsimilis</i> (Hodgson)	Black Drongo			
66.	<i>Dicrurus aeneus</i> Vieillot	Bronzed Drongo			
67.	<i>Dicrurus caerulescens</i> (Linnaeus)	White-bellied Drongo			
68.	<i>Dicrurus leucophaeus</i> Vieillot	Grey Drongo			
69.	<i>Dicrurus paradiseus</i> (Linnaeus)	Racket tailed Drongo			
70.	<i>Dinopium javanense</i> Whistler & Kinnear	Woodpecker			S-IV
71.	<i>Ducula badia</i> (Raffles)	Mountain Imperial Pigeon			S-IV
72.	<i>Dumetia hyperythra</i> (Franklin)	Rufous-bellied Babbler			
73.	<i>Egretta alba</i> (Gray)	Large Egret			
74.	<i>Egretta garzetta</i> (Linnaeus)	Little Egret			S-IV
75.	<i>Egretta intermedia</i> (Wagler)	Median Egret			
76.	<i>Elanus caeruleus</i> (Latham)	Black winged Kite			S-I
77.	<i>Eremopterix grisea</i> (Scopoli)	Ashy-crowned Finch Lark			S-IV
78.	<i>Estrilda amandava</i> (Linnaeus)	Avadavat/ Red Munia			
79.	<i>Eudynamis scolopacea</i> (Linnaeus)	Koel			S-IV
80.	<i>Eumyias albicaudata</i> Jerdon	Nilgiri Flycatcher	Endemic to WG		
81.	<i>Falco tinnunculus</i> Linnaeus	Indian Kestrel			S-IV
82.	<i>Francolinus pondicerianus</i> (Latham)	Grey Partridge			S-IV
83.	<i>Gallinago stenura</i> Bonaparte	Pintail Snipe			S-IV
84.	<i>Gallinula chloropus</i> Blyth	Indian Moorhen			S-IV

85.	<i>Galloperdix spadicea</i> (Gmelin)	Red Spurfowl			S-IV
86.	<i>Gallus sonneratii</i> Temminck	Grey Junglefowl			S-IV
87.	<i>Garrulax jerdoni</i> (Blanford)	Kerala or Jerdon's Laughing Thrush	Endemic to WG		
88.	<i>Glaucidium radiatum</i> (Tickell)	Barred Jungle Owlet			S-IV
89.	<i>Gracula religiosa</i> Linnaeus	Hill Myna			
90.	<i>Grus virgo</i> (Linnaeus)	Demoiselle Crane			
91.	<i>Gyps bengalensis</i> (Gmelin)	Indian White-backed or Bengal Vulture		CR	
92.	<i>Gyps indicus</i> (Scopoli)	Long-billed Vulture		CR	S-IV
93.	<i>Halcyon smyrnensis</i> (Linnaeus)	White-breasted Kingfisher			S-IV
94.	<i>Haliastur indus</i> (Boddaert)	Brahminy Kite			S-I
95.	<i>Hemiprocne longipennis</i> (Tickell)	Crested Tree Swift			
96.	<i>Hemipus picatus</i> (Sykes)	Pied Flycatcher Shrike			S-IV
97.	<i>Hierococcyx varius</i> Vahl	Common Hawk Cuckoo or Brainfever Bird			S-IV
98.	<i>Himantopus himantopus</i> (Linnaeus)	Black-winged Stilt			S-IV
99.	<i>Hirundo daurica</i> Linnaeus	Red-rumped Swallow			
100.	<i>Hirundo rustica</i> Linnaeus	Common Swallow			
101.	<i>Hirundo smithii filifera</i> Stephens	Wire-tailed Swallow			
102.	<i>Hydrophasianus chirurgus</i> (Scopoli)	Pheasant-tailed Jacana			S-IV
103.	<i>Hypsipetes indicus</i> (Jerdon)	Yellow-browed Bulbul			
104.	<i>Hypsipetes madagascariensis</i> Sykes	Black Bulbul			
105.	<i>Ictinaetus malayensis</i> (Hodgson)	Black Eagle			S-I

106.	<i>Lanius cristatus</i> Linnaeus	Brown Shrike			
107.	<i>Lanius schach</i> Linnaeus	Rufous-backed Shrike			
108.	<i>Lanius vittatus</i> Valenciennes	Bay-backed Shrike			
109.	<i>Lonchura malabarica</i> (Linnaeus)	White-throated Munia			
110.	<i>Lonchura punctulata</i> (Linnaeus)	Spotted Munia			
111.	<i>Lonchura striata</i> (Linnaeus)	White-backed Munia			
112.	<i>Loriculus vernalis</i> (Sparrman)	Lorikeet			S-IV
113.	<i>Megalaima haemacephala</i> (Latham)	Indian Crimson-breasted Barbet			S-IV
114.	<i>Megalaima viridis</i> (Boddaert)	Small Green Barbet			S-IV
115.	<i>Megalaima zeylanica</i> (Gmelin)	Large Green Barbet			
116.	<i>Merops orientalis</i> Latham	Small Green Bee-eater			
117.	<i>Micropternus brachyurus</i> (Vieillot)	Rufous Woodpecker			
118.	<i>Milvus migrans</i> (Boddaert)	Black Kite			S-I
119.	<i>Mirafra assamica affinis</i> Blyth	Madras Bush Lark			S-IV
120.	<i>Hypothymis azurea</i> (Hartlaub)	Black-naped Blue Flycatcher			
121.	<i>Monticola cinclorhynchus</i> (Vigors)	Blue headed Rock Thrush			
122.	<i>Monticola solitarius</i> (Linnaeus)	Blue Rock Thrush			
123.	<i>Motacilla cinerea</i> (Tunstall)	Grey Wagtail			S-IV
124.	<i>Motacilla maderaspatensis</i> Gmelin	Large Pied Wagtail			S-IV
125.	<i>Motacilla alba</i> Sykes	White Wagtail			S-IV
126.	<i>Motacilla flava</i> (Billberg)	Black-headed Yellow Wagtail			S-IV

127.	<i>Muscicapa dauurica</i> (Pallas)	Brown Flycatcher			
128.	<i>Muscicapa latirostris</i> Raffles	Brown Flycatcher			
129.	<i>Muscicapa muttui</i> (Layard)	Brown-breasted Flycatcher			
130.	<i>Muscicapa parva</i> Pallas	Red-breasted Flycatcher			
131.	<i>Muscicapa thalassina</i> Swainson	Nilgiri Verditer Flycatcher			
132.	<i>Muscicapa tickelliae</i> (Blyth)	Tickell's Blue Flycatcher			
133.	<i>Mycteria leucocephala</i> (Pennant)	Painted Stork		NT	
134.	<i>Myiophonus horsfieldii</i> (Vigors)	Malabar Whistling Thrush			S-IV
135.	<i>Nectarinia asiatica</i> (Latham)*	Purple Sunbird			
136.	<i>Nectarinia lotenia</i> (Linnaeus)**	Loten's Sunbird			
137.	<i>Nectarinia minima</i> (Sykes)	Small Sunbird	Endemic to WG		
138.	<i>Nectarinia zeylonica</i> *** (Linnaeus)	Purple rumped sunbird			
139.	<i>Neophron percnopterus</i> (Linnaeus)	White Scavenger Vulture			S-IV
140.	<i>Nycticorax nycticorax</i> (Linnaeus)	Night Heron			S-IV
141.	<i>Nyctyornis athertoni</i> (Jardine & Selby)	Blue-bearded Bee eater			
142.	<i>Oriolus oriolus</i> (Linnaeus)	Golden Oriole			
143.	<i>Oriolus xanthornus</i> (Linnaeus)	Black-hooded Oriole			
144.	<i>Orthotomus sutorius</i> (Forster)	Tailor Bird			
145.	<i>Parus major</i> Linnaeus	Grey Tit			
146.	<i>Parus nuchalis</i> Jerdon	Yellow-cheeked Tit			

147.	<i>Passer domesticus</i> (Linnaeus)	House Sparrow			
148.	<i>Pavo cristatus</i> (Linnaeus)	Pea fowl			S-I
149.	<i>Pelecanus philippensis</i> Gmelin	Grey Pelican		VU	S-IV
150.	<i>Pellorneum ruficeps</i> Swainson	Spotted Babbler			
151.	<i>Perdica asiatica</i> (Latham)	Jungle or Bush Quail			S-IV
152.	<i>Perdica erythrorhyncha</i> (Sykes)	Painted Bush Quail			S-IV
153.	<i>Pericrocotus cinnamomeus</i> (Linnaeus)	Small Minivet			S-IV
154.	<i>Pericrocotus erythropygius</i> (Jerdon)	White-bellied Minivet			
155.	<i>Pericrocotus flammeus</i> (Forster)	Scarlet Minivet			S-IV
156.	<i>Pernis ptilorhynchus</i> Lesson	Honey Buzzard			S-IV
157.	<i>Phaenicophaeus viridirostris</i> (Jerdon)	Small Green-billed Malkoha			S-I
158.	<i>Phalacrocorax carbo</i> (Shaw)	Great Cormorant			S-IV
159.	<i>Phalacrocorax fuscicollis</i> Stephens	Indian Cormorant			S-IV
160.	<i>Phalacrocorax niger</i> (Vieillot)	Little Cormorant			S-IV
161.	<i>Phylloscopus occipitalis</i> (Blyth)	Large-crowned Leaf Warbler			
162.	<i>Phylloscopus trochiloides</i> (Sundevall)	Greenish Leaf Warbler			
163.	<i>Picoides mahrattensis</i> (Latham)	Yellow-fronted Pied Woodpecker			
164.	<i>Picoides nanus</i> (Vigors)	Pigmy Woodpecker			
165.	<i>Pitta brachyura</i> (Linnaeus)	Indian Pitta			S-IV
166.	<i>Platalea leucorodia</i> (Linnaeus)	Eurasian Spoonbill			S-I
167.	<i>Ploceus philippinus</i> (Linnaeus)	Baya			

168.	<i>Pomatorhinus horsfieldii</i> Sukes	Slaty-headed Scimitar Babbler			
169.	<i>Prinia hodgsonii</i> Blyth	Franklin's Wren Warbler			
170.	<i>Prinia socialis</i> Sykes	Southern Ashy Wren Warbler			
171.	<i>Prinia subflava</i> (Gmelin)	Nilgiri Plain Wren Warbler			
172.	<i>Prinia sylvatica</i> Jerdon	Jungle Wren Warbler			
173.	<i>Psittacula columboides</i> (Vigors)	Blue-winged Parakeet	Endemic to WG		S-IV
174.	<i>Psittacula cyanocephala</i> (Linnaeus)	Blossom-headed Parakeet			S-IV
175.	<i>Psittacula krameri</i> (Scopoli)	Rose-ringed Parakeet			S-IV
176.	<i>Pycnonotus cafer</i> (Linnaeus)	Red-vented Bulbul			S-IV
177.	<i>Pycnonotus jocosus</i> (Linnaeus)	Red-whiskered Bulbul			S-IV
178.	<i>Pycnonotus luteolus</i> (Lesson)	White-browed Bulbul			S-IV
179.	<i>Pycnonotus priocephalus</i> (Jerdon)	Grey-headed Bulbul	Endemic to WG		S-IV
180.	<i>Pycnonotus xantholaemus</i> (Jerdon)	Yellow-throated Bulbul	Endemic to WG	VU	S-IV
181.	<i>Rhipidura albicollis</i> (Vieillot)	White-throated fantail Flycatcher			
182.	<i>Rhipidura aureola</i> Blyth	White-browed Fantail Flycatcher			
183.	<i>Rhopodytes viridirostris</i> (Jerdon)	Small Green-billed Malkoha			
184.	<i>Rhopocichla atriceps</i> (Jerdon)	Black-capped Babbler			
185.	<i>Sarcogyps calvus</i> (Scopoli)	King Vulture/ Red-headed Vulture		NT	S-IV

186.	<i>Saxicola caprata</i> (Linnaeus)	Pied Bush Chat			
187.	<i>Saxicola torquata</i> (Blyth)	Collared Bushchat			
188.	<i>Saxicoloides fulicata</i> (Linnaeus)	Indian Robin			
189.	<i>Scolopax rusticola</i> Linnaeus	Woodcock			S-IV
190.	<i>Sitta castanea</i> Franklin	Chestnut-bellied Nuthatch			
191.	<i>Sitta frontalis</i> Swainson	Velvet-fronted Nuthatch			
192.	<i>Spilornis cheela</i> (Latham)	Crested Serpent Eagle			S-I
193.	<i>Streptopelia decaocto</i> (Frisvaldszky)	Ring Dove			
194.	<i>Streptopelia senegalensis</i> (Linnaeus)	Little Brown Dove			S-IV
195.	<i>Streptopelia chinensis</i> (Scopoli)	Spotted Dove			S-IV
196.	<i>Strix ocellata</i> (Lesson)	Mottled Wood Owl			
197.	<i>Sturnus malabaricus</i> (Gmelin)	Grey-headed Myna			
198.	<i>Sturnus pagodarum</i> (Gmelin)	Brahminy Starling			
199.	<i>Sturnus roseus</i> (Linnaeus)	Rosy Starling/ Rosy Pastor			
200.	<i>Sylvia hortensis</i> (Gmelin)	Orphean Warbler			
201.	<i>Taccocua leschenaultii</i> Lesson	Sirkeer Cuckoo			
202.	<i>Tephrodornis gularis</i> Jerdon	Malabar Wood Shrike			S-IV
203.	<i>Tephrodornis pondicerianus</i> (Gmelin)	Common Wood Shrike			S-IV
204.	<i>Terpsiphone paradisi</i> (Linnaeus)	Paradise Flycatcher			

205.	<i>Threskiornis aethiopicus</i> (Latham)	White Ibis			
206.	<i>Tockus birostris</i> (Scopoli)	Common Grey Hornbill			
207.	<i>Treron phoenicoptera</i> (Latham)	Yellow-legged Green Pigeon			S-IV
208.	<i>Treron pompadora</i> (Gmelin)	Grey-fronted Green Pigeon			S-IV
209.	<i>Tringa glareola</i> Linnaeus	Wood Sandpiper			S-IV
210.	<i>Tringa hypoleucos</i> Linnaeus	Common Sandpiper			S-IV
211.	<i>Tringa ochropus</i> Linnaeus	Green Sandpiper			S-IV
212.	<i>Turdoides affinis</i> (Jerdon)	White-headed Babbler			
213.	<i>Turdoides malcolmi</i> (Sykes)	Large Grey Babbler			
214.	<i>Turdoides striatus</i> (Swainson)	Jungle Babbler			
215.	<i>Turdoides caudatus</i> (Dumont)	Common Babbler			
216.	<i>Turdus merula</i> Linnaeus	Blackbird			
217.	<i>Tyto alba</i> Hartert	Barn Owl			S-IV
218.	<i>Upupa epops</i> Linnaeus	Hoopoe			
219.	<i>Vanellus indicus</i> (Boddaert)	Indian Red-wattled Lapwing			S-IV
220.	<i>Vanellus malabaricus</i> (Boddaert)	Yellow-wattled Lapwing			S-IV
221.	<i>Zoothera citrina</i> (Latham)	White-throated Ground Thrush			
222.	<i>Zosterops palpebrosus</i> (Temminck)	Oriental White-eye			

CR : Critically Endangered; VU : Vulnerable; NT : Near Threatened; S-I & S-IV : Schedule I & IV of Indian Wildlife Protection Act (1972).

*Currently known as *Cinnyris asiaticus*
 **Currently known as *Cinnyris lotenius*
 ***Currently known as *Leptocoma zeylonica* } Cheke *et al.*, 2001

SUMMARY

Earlier Karthikeyan (2003) reported the presence of 195 species in Bannerghatta National Park and as of now the tally stands at 222 species accommodated in 144 genera, 47 families distributed in 16 orders. There are 2 critically endangered species (*Gyps bengalensis* & *G. indicus*), 4 Vulnerable species (*Aquila clanga*, *Columba elphinstonii*, *Pelicanus phillippensis* and *Pycnonotus xantholaemus*) and 4 Nearly Threatened ones (*Anhinga melanogaster*, *Circus microurus*, *Mycteria leucocephalus* & *Sarcogyps calvus*). Seven species endemic to Western Ghats are found here (*Columba elphinstonii*, *Eumyias albicaudata*, *Garrulax jerdoni*, *Nectarinia minima*, *Psittacula columboides*, *Pycnonotus priocephalus* & *Pycnonotus xantholaemus*). Out of the 222 species listed here, 13 species fall under Schedule I and 94 under Schedule IV. The Passeriform species dominate, as expected (more than 100 species) with larger components from the family Muscicapidae (with dominance of subfamilies Sylvinae, and Muscicapinae and the family Campephagidae is represented by 8 species. There are 41 species of water birds, 24 winter visitors and a few passage migrants and summer visitors.

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MAMMALIA

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INTRODUCTION

There are 4629 species of mammals in the world accommodated in 1135 genera under 136 families and 26 orders (Pocock, 1939; Pocock, 1941; Ellerman, & Morrison-Scott, 1951; Blanford, 1888-1891; Corbet & Hill, 1992; Wilson & Reeder, 1993; Alfred *et al.*, 2006). Out of these, the Indian subcontinent provides asylum to 401 species belonging to 180 genera, 45 families and 13 orders. We have 45 species of endemics in India. India being the confluence of three major biogeographical realms, has its composition derived from Oriental, Palaearctic and Ethiopian elements in addition to its own, working out to approximately 8.6% of the world inventory. In southern India, Alfred *et al.* (2006) have reported the occurrence of 151 species of mammals. In this work we document the occurrence of 44 species of mammals placed in 35 genera 24 families and 9 orders and provide distribution details. In addition, we also present the conservation status of these animals in accordance with IUCN, IWPA, RBD, CITES and CAMP 1997.

Table-1 : Mammals of Bannerghatta National Park

S. No.	Name of the species & Common English Name	Distribution	Conservation status as per				
			IUC N	IWP A	RD B	CIT ES	CAMP, 1997
1.	Order INSECTIVORA Family SORICIDAE <i>Crocidura horsfieldi</i> (Tomes, 1856). Horsefield's Shrew	Jammu & Kashmir and montane forests of Karnataka.	–	–	–	–	DD (Nationally & Globally)
2.	<i>Suncus etruscus</i> (Savi, 1822). Savi's Pygmy Shrew	Throughout India except the arid regions of Gujarat, Jammu & Kashmir, Rajasthan.	–	–	–	–	LRlc (Nationally & Globally)
3.	<i>Suncus montanus</i> (Kelaart, 1850). Ceylon Shrew	Karnataka, Kerala and Tamil Nadu.	VU	–	–	–	VU (Nationally) DD(Globally)

4.	<i>Suncus murinus</i> (Linnaeus, 1766). Grey Musk Shrew, House Shrew	Throughout the country.	—	—	—	—	LRlc (Nationally & DD Globally)
5.	Order CHIROPTERA Family PTEROPODIDAE <i>Cynopterus brachyotis</i> (Muller, 1838). Lesser Dog-faced Fruit Bat	Southern India and Andaman & Nicobar islands at altitude up to 1500m.	—	Sch.V	—	—	LRlc (Nationally & DD Globally)
6.	<i>Cynopterus sphinx</i> Vahl, 1797. Short-nosed Fruit Bat	Occurs throughout this country except higher Himalaya and deserts.	—	Sch.V	—	—	LRlc (Nationally & DD Globally)
7.	<i>Pteropus giganteus</i> (Brunnich, 1782). Indian Flying Fox	Throughout India including Andaman islands.	—	Sch.V	—	App. II	LRnt
8.	<i>Rousettus leschenaulti</i> , (Desmarest, 1820). Fulvous Fruit Bat	Throughout India except deserts and high mountains.	—	Sch.V	—	—	LRlc (Nationally & DD Globally)
9.	Family RHINOPOMATIDAE <i>Rhinopoma hardwickei</i> Gray, 1831. Lesser Mouse-tailed Bat	Andhra Pradesh, Assam, Bihar, Delhi, Gujarat, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Nagaland, Orissa, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal.	—	—	—	—	LRnt (Nationally & DD Globally)
10.	Family EMBALLONURIDAE <i>Taphozous longimanus</i> Hardwicke, 1825. Long-winged Tomb Bat	From Gujarat in the west, Rajasthan in the north, Tamil Nadu in the south, Tripura and Nagaland in the east.	—	—	—	—	LRlc (Nationally & DD Globally)
11.	<i>Taphozous melanopogon</i> Temminck, 184. Black-bear Tomb Bat	Throughout India except Jammu & Kashmir.	—	—	—	—	LRnt (Nationally & DD Globally)
12.	Family MEGADERMATIDAE <i>Megaderma lyra</i> Geoffroy, 1810. Greater False Vampire	Throughout India except desert areas and high elevations of Himalayas.	—	—	—	—	LRlc (Nationally & DD Globally)

13.	<i>Megaderma spasma</i> (Linnaeus, 1758). Lesser False Vampire	Andhra Pradesh, Assam, Karnataka, Kerala, Goa, Gujarat, Orissa, Tamilnadu, West Bengal, and Andaman & Nicobar islands.	–	–	–	–	–
14.	Family RHINOLOPHIDAE <i>Rhinolophus rouxii</i> Temminck, 1835. Rufous Horse-shoe Bat	Andhra Pradesh, Arunachal Pradesh, Goa, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Mizoram, Orissa, Pondicherry, Sikkim, Tamil Nadu, Uttaranchal and West Bengal.	–	–	–	–	LRnt (Nationally & DD Globally)
15.	Family HIPPOSIDERIDAE <i>Hipposideros fulvus</i> Gray, 1838. Fulvous Leaf-nosed Bat	Throughout India except Jammu & Kashmir, and North-east India.	–	–	–	–	LRnt (Nationally) DD (Globally)
16.	<i>*Hipposideros schistaceus</i> Anderson, 1918. Leaf-nosed Bat	Confined to Andhra Pradesh & Karnataka.	DD	–	–	–	DD (Nationally)
17.	<i>Hipposideros speoris</i> (Schneider, 1800). Schneider's Leaf-nosed Bat	Andhra Pradesh, Karnataka, Kerala, Orissa, Tamil Nadu and Uttaranchal.	–	–	–	–	LRnt (Nationally) DD (Globally)
18.	Family VESPERTILIONIDAE <i>Hesperoptenus tickelli</i> (Blyth, 1851) Tickell's Bat	Andhra Pradesh, Bihar, Goa, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu, West Bengal and Andaman Islands.	–	–	–	–	DD (Nationally & Globally)

19.	<i>Pipistrellus coromandra</i> (Gray, 1838). Indian Pipistrelle	Almost throughout the country including Nicobar islands.	—	—	—	—	LRnt (Nationally) DD (Globally)
20.	Order PRIMATES Family LORIDAE <i>Loris tardigradus</i> Linnaeus, 1758. Slender Loris	Andhra Pradesh, Karnataka, Kerala and Tamil Nadu.	VU	Sch. I	VU	App. II	LRnt (Nationally) DD (Globally)
21.	Family CERCOPITHECIDAE * <i>Macaca radiata</i> (Geoffroy Saint-Hilaire, 1812). Bonnet Macaque	Andhra Pradesh, Karnataka, Kerala, Maharashtra and Tamil Nadu.	—	Sch. II	—	App. II	LRlc
22.	Order CARNIVORA* Family CANIDAE <i>Canis aureus</i> (Linnaeus, 1758). Asiatic Jackal; Golden Jackal	Throughout the country.	—	Sch. II Part II	—	App. III	LRlc (Nationally)
23.	<i>Canis lupus</i> Linnaeus, 1758. Wolf	Throughout India except extreme south.	—	SchI Part I	VU IK	App. I	LRnt (Nationally) DD (Globally)
24.	<i>Vulpes bengalensis</i> (Shaw, 1800). Indian Fox	Throughout the country.	DD	SchII Part II	—	App. II	LRnt (Nationally) DD (Globally)
25.	Family FELIDAE <i>Felis chaus</i> (Schreber, 1777). Jungle Cat	Most common lesser cat occurring throughout India.	—	SchII Part II	—	App. II	LRnt (Nationally) DD (Globally)
26.	<i>Panthera pardus</i> (Linnaeus, 1758). Leopard; Panther	Throughout India in suitable habitats.	—	SchI Part I	VU	App. I	VU (Nationally) DD (Globally)
27.	Family HERPESTIDAE <i>Herpestes edwardsii</i> , Geoffroy, 1818. Grey Mongoose	Throughout India.	—	Sch. IV	—	App. III	LRlc (Nationally) DD (Globally)
28.	Family URSIDAE <i>Melursus ursinus</i> (Shaw, 1791) Sloth Bear	Throughout India from Himalayan foot hills to southern most regions, except arid region of Rajasthan and Gujarat.	VU	SchI Part I	—	App. I	VU (Nationally) DD (Globally)

29.	Family VIVERRIDAE <i>Viverricula indica</i> Desmarest, 1817. Small Indian Civet	Throughout the country.	~	SchII Part II	~	App. III	LRnt (Nationally) DD (Globally)
30.	Order PROBOSCIDEA Family ELEPHANTIDAE <i>Elephas maximus</i> Linnaeus, 1758. Asian or Indian Elephant	Wild elephants distributed in Andhra Pradesh, Bihar, Orissa, Uttar Pradesh, Western Ghats, West Bengal and North-eastern states and some feral herds in Andaman islands.	EN	SchI Part I	~	App. I	VU(Nationally) DD (Globally)
31.	Order ARITODACTYLA Family SUIDAE <i>Sus scrofa</i> (Linnaeus, 1758). Wild Boar	Almost throughout the country including Andaman & Nicobar islands.	~	Sch. III	IK	~	LRlc(Nationally) DD (Globally)
32.	Family CERVIDAE <i>Axis axis</i> (Erxleben, 1777). Spotted Deer; Chital	Throughout India, northwards up to Kumoan (Uttaranchal), Sikkim and West Bengal and east up to Assam.	~	Sch IV	~	~	LRlc (Nationally) DD (Globally)
33.	<i>Cervus unicolor</i> Kerr, 1792. Sambar	Throughout India except mountains and deserts.	~	Sch. III	~	~	LRlc (Nationally) DD (Globally)
34.	Family BOVIDAE <i>Bos frontalis</i> Lambert, 1804. Indian Bison; Gaur	Bihar, North-east India, Orissa, Peninsular India and duars of West Bengal.	VU	Sch I Part I	VU	App. I	VU(Nationally) DD (Globally)
35.	Order PHOLIDOTA Family MANIDAE <i>Manis crassicaudata</i> Gray, 1827. Indian Pangolin	From the south of the Himalaya to Kanyakumari excepting North-east region.	LRnt	Sch. I Part I	IK	App. II	LRnt (Nationally) DD (Globally)
36.	Order RODENTIA Family SCIURIDAE <i>Funambulus palmarum</i> (Linnaeus 1766). Indian Palm Squirrel; Three-striped Squirrel	Andhra Pradesh, Bihar, Karnataka, Kerala, Madhya Pradesh, Maharastra, Orissa, Tamil Nadu and West Bengal.	~	~	~	~	LRnt (Nationally) DD (Globally)

37.	<i>*Ratufa indica</i> (Erxleben, 1777). Indian Giant Squirrel; Malabar Squirrel	Widely distributed in Peninsular India in the south up to 22° N, mainly in the Western Ghats with isolates in the north-east up to Bihar. Reported from Andhra Pradesh, Bihar, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, and Tamil Nadu.	VU	SchII Part II	–	App. II	VU (Nationally) DD (Globally)
38.	Family MURIDAE <i>Tatera indica</i> (Hardwicke, 1807). Indian Gerbil; Antelope Rat	Throughout the country excepting Northeastern states and Sikkim.	–	Sch.V	–	–	LRlc (Nationally) DD (Globally)
39.	<i>Bandicota indica</i> (Bechstein, 1800). Greater Bandicoot Rat	Almost throughout India.	–	Sch.V	–	–	LRnt (Nationally) DD (Globally)
40.	<i>Mus booduga</i> (Sen & Sharma, 1983). Common Indian Field Mouse	Throughout the country.	–	Sch.V	–	–	LRlc (Nationally) DD (Globally)
41.	<i>Mus musculus</i> Linnaeus, 1758. House Mouse	Almost throughout the country.	–	Sch.V	–	–	LRlc (Nationally) DD (Globally)
42.	<i>Rattus rattus</i> (Linnaeus, 1758). Black Rat; Common House Rat	Almost throughout the country.	–	Sch.V	–	–	LRlc (Nationally) DD (Globally)
43.	Family HYSTRICIDAE <i>Hystrix indica</i> (Kerr, 1792). Indian Crested Porcupine	Throughout the country	–	Sch.IV	–	–	LRlc (Nationally) DD (Globally)
44.	Order LAGOMORPHA Family LEPORIDAE <i>Lepus nigricollis</i> Cuvier, 1823. Indian Hare; Black-naped Hare	Almost throughout the country.	–	Sch.IV	–	–	LRlc (Nationally) DD (Globally)

IUCN - International Union for Conservation of Nature and Natural Resources; IWPA - Indian Wildlife (Protection) Act 1972; RDB - Red Data Book; CAMP - Conservation Assessment and Management Plan of Biodiversity Conservation Prioritization Project; CITES - Convention on International Trade in Endangered Species of Wild Fauna and Flora; EN - Endangered; VU - Vulnerable; R-Rare; IK - Insufficiently known; LRnt - Lower Risk-near threatened; LRlc - Lower Risk-least concern; DD - Data Deficient; * Endemic to India)

SUMMARY

It is interesting to note that out of the 44 species of mammals occurring in Bannerghatta National Park 28 come under Indian Wildlife Protection Act, 1972 Schedule I to V and 3 are endemic to India.

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