CHECKLIST OF TERRESTRIAL GASTROPODS OF KARNATAKA, INDIA

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ABSTRACT

A checklist of the land snails present in the Western Ghats of Karnataka based on the Fauna of British India *and collections carried out by us during the past 3½ years is presented here. Seventy-nine species are listed with updated classification and nomenclature.*

KEYWORDS

Ariophanta, Cryptozona, Cyathopoma, Cyclophorus, Glessula, *Karnataka, Land snails,* Nicida*, Western Ghats*

Land snails account for around 30,000 of the estimated 1,50,0000 members of the Phylum Mollusca (Abbott, 1989). They form an integral constituent of the soil/leaf litter ecosystem, playing an important role in nutrient recycling. With their simple structure, sluggish nature and persistent shells, they form an ideal candidate for biomonitoring. Unfortunately, for the last 75 years or so, no attention has been paid for this important group in the Western Ghats, except for some localized reviews and publications (Satyamurthy, 1960; Tonapi & Mulhekar, 1963; Tonapi 1971; Subba Rao & Mitra, 1979, Ramakrishna & Mitra, 2002; Naggs, 1997; Madhyastha *et al.*, 2003, submitted; Mavinkurve *et al.*, in press 1, in press 2; Sandhya *et al.*, submitted). With the exception of a checklist of land and fresh water molluscs of Pune district of Maharastra, there is no checklists available for Tamil Nadu, Kerala or Karnataka. This list is an initial step in that direction starting with the Karnataka region.

STUDY AREA

Karnataka with an area of 1,91,791km^2 is a veritable home for a diverse fauna and flora. This study was undertaken in the Western Ghats that form the backbone of the state running along the western side. The vegetation in the ghats varies from evergreen to semievergreen and moist deciduous forests. These forests provide ample refuge for a variety of land snails. Rainfall occurs in this region for six months from mid May to mid September, following a dry spell of summer from mid February. Ten areas where chosen along the Western Ghats (Fig. 1) where different habitat types were sampled during 2000-2004.

RESULTS

The old system of classification has changed to a considerable extent ever since the *Fauna of British India* was published (Blanford & Godwin-Austen, 1908; Gude, 1914, 1921). The sub family *Diplommatinidae* of the family *Cyclophoridae* has been elevated to the family level; *Zonitidae* has given rise to the families *Ariophantidae, Euconulidae* and *Helixarionidae*. Even at generic level the genus *Ariophanta* has been trifurcated into purely sinistral *Ariophanta*, dextral *Cryptozona* and *Hemiplecta*. The present study tries to ease these confusion by following the classification adopted by Vaught (1989).

Karnataka harbours 79 species belonging to 33 genera of which 61 species are endemic to the Western Ghat/Sri Lanka hill chains. The land snails of Western Ghats show a relative endemism of 83% (Mavinkurve *et al.* 2004b), and 77% of them are endemic to Karnataka. This decrease in endemism could be attributed to the presence of introduced species like *Achatina fulica*, *Subulina octona* and *Bradybaena similaris.* Of the 22 families present in the Western Ghats 13 families are represented in Karnataka. Of the 56 species identified, highest diversity of land snails is found in the Kodagu district. This is not surprising considering the fact there are pristine forests, which provide ample microhabitats for the snails to thrive.

Many of them are pests to commercial crops; the slug *Mariaella* infects vanilla plants feeding voraciously on the succulent buds and leaves. Most of the members of the Family *Subulinidae* are introduced inadvertently by horticulture and are regularly found in home gardens, especially in flowerpots and moist areas. The notorious pest *Achatina fulica* is found in the Western Ghats apart from reports from Shimoga and other places. Future studies need to concentrate on species like *Leptopomoides valvatus*, *Mychopoma seticinctum* and *Diplommatina canarica* the only *Diplommatina* described from southern India and rare species like *Gluella canarica*. We hope this list will stimulate interest in gathering additional information on the distribution, ecology and the status of the species presented.

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Table 1. List of land snails from Karnataka as mentioned in the* Fauna of British India *and species observed during this study

Class: Gastropoda
Sub Class: Prosobranchia
Order: Mesogastropoda
Super family: Cylophoroidea
Family: Cyclophoridae

Genus: *Craspedotropis* Blanford, 1864
1. Craspedotropis bilirata (Beddome, 1875)*#
2. Craspedotropis cuspidata (Benson, 1851)*#

Genus: *Leptopomoides* G. Nevill, 1878
3. Leptopomoides valvatus (Mollendroff, 1897)*

Genus: *Theobaldius* G. Nevill, 1878
4. Theobaldius ravidus (Benson, 1851)*
5. Theobaldius tristis (Blanford, 1869)*#

Genus: *Cyclophorus* Montfort, 1810
6. Cyclophorus altivagus (Benson, 1854)*#
7. Cyclophorus indicus (Deshayes, 1832)*#
8. Cyclophorus nilagiricus (Benson, 1852)*#

Genus: *Pterocyclus* Benson, 1832
9. Pterocyclus bilabiatus (Sowerby, 1843)*#
10. Pterocyclus cyclophoroideus (G. Nevill, 1881)*#
11. Pterocyclus nanus (Benson, 1851)*#

Genus: *Cyathopoma* Blanford, 1861
12. Cyathopoma atrosetosum (Beddome, 1875)*#
13. Cyathopoma latilabrie (Beddome, 1875)*#
14. Cyathopoma nitidum (Beddome, 1875)*#
15. Cyathopoma ovatum (Beddome, 1875)*#
16. Cyathopoma wynaadense (Blanford, 1868)*

Genus: *Mychopoma* Blanford, 1861
17. Mychopoma seticinctum (Beddome, 1875)*

Genus: *Alycaeus* Gray, 1850
18. Alycaeus expatriatus (Blanford, 1860)*#
19. Alycaeus footei (Blanford, 1861)*#

Family: Diplommatinidae

Genus: *Nicida* W. Blanford, 1868
20. Nicida anamullayana (Beddome, 1875)*
21. Nicida liricincta (Blanford, 1868)#*
22. Nicida nitidula (Blanford, 1868)#
23. Nicida subovata (Beddome, 1875)*#

Genus: *Diplommatina* Benson, 1849
24. Diplommatina canarica (Beddome, 1875)*

Genus: *Ophisthostoma* W & H. Blanford, 1860
25. Ophisthostoma deccanense (Beddome, 1875)*#
26. Ophisthostoma fairbanki (Beddome, 1875)*#
27. Ophisthostoma macrostoma (Blanford, 1869)*

Sub Class: Gymnomorpha
Order: Soleolifera
Family: Veronicellidae

Genus: Filicaulis Simroth, 1913
28. Filicaulis (*Lavecaulis*) *frauenfeldi* (Semper 1885)*#

Sub Class: Pulmonata
Order: Stylommatophora
Sub order: Elasmognatha
Super Family: Succinoidea
Family: Succienidae

Genus: *Succinea* Draparnaud, 1801
29. Succinea baconi (Pfeiffer, 1854)
30. Succinea raoii (Rao & Mitra, 1978)*#
31. Succinea subgranosa (Pfeiffer, 1849)#

Super Family: Helixarionoidea
Family: Ariophantidae

Genus: *Ariophanta* Desmoulins, 1829
32. Ariophanta canarica (Blanford, 1901)*#
33. Ariophanta cysis (Benson, 1852)*#
34. Ariophanta immerita (Blanford, 1870)*#
35. Ariophanta thyreus (Benson, 1852)*#

Genus: *Cryptozona* Morch, 1872
36. Cryptozona maderaspatana (Gray, 1834)*#
37. Cryptozona sisparica (Blanford, 1866)*
38. Cryptozona solata (Benson, 1848)*#

Genus: *Indrella* Godwin-Austen, 1901
39. Indrella ampulla (Benson, 1850)*#

Genus: *Euplecta* Semper, 1870
40. Euplecta acuducta (Benson, 1850)
41. Euplecta fluctuosa (Blanford, 1901)*
42. Euplecta granulifera (Blanford, 1901)*#
43. Euplecta indica (Pfeiffer, 1846)*#
44. Euplecta mucronifera (H. Adams, 1869)* #

Genus: *Macrochlamys* Benson, 1832
45. Macrochlamys woodiana (Pfeiffer, 1851)#

Genus: *Mariaella* Gray 1855
46. Mariaella beddomei (Godwin-Austen, 1888)*#
47. Mariaella dussumieri (Gray, 1855)*#

Genus: *Sitala* H. Adams, 1865
48. Sitala liricincta (Stolickzka, 1871)#
49. Sitala palmaria (Benson, 1864)*

Family: Helixarionidae

Genus: *Kaliella* Blanford, 1863
50. Kaliella barrackporensis (Pfeiffer, 1852)#

Super Family: Camaenoidea
Family: Camaenidae

Genus: *Chloritis*, Beck 1837
51. Chloritis propinqua (Pfeiffer, 1857)#

Sub Order: Sigmurethra
Super Family: Punctoidea
Family: Endodontidae

Genus: Philalanka Godwin-Austen, 1898
52. Philalanka bidenticulata (Benson, 1852)*#
53. Philalanka quinquilirata (Gude, 1914)*#

Family: Charopidae

Genus: *Ruthvenia* Gude, 1911
54. Ruthvenia retifera (Pfeiffer, 1845)*#

Super family: Achatinoidea
Family: Achatinidae

Genus: *Achatina* Lamarck, 1799
55. Achatina fulica (Bowdich, 1822)#

Family: Subulinidae

Genus: *Subulina* Beck, 1837
56. Subulina octona (Bruguiere, 1789)#

Genus: Opeas Albers, 1850
57. Opeas gracilis (Hutton, 1834)#

Genus: *Zootecus* Westerlund, 1887
58. Zootecus insularis (Ehrenberg, 1831)#

Genus: *Glessula* Von Martens, 1860
59. Glessula canarica (Beddome, 1906)*#
60. Glessula chessoni (Benson, 1860)*#
61. Glessula inornata (Pfeiffer, 1851)
62. Glessula oreas (Reeve, 1850)*
63. Glessula orophila (Reeve, 1849)#
64. Glessula pseudoreas (Nevill, 1881)*
65. Glessula subserena (Beddome, 1906)*
66. Glessula tenuispira (Benson, 1836)
67. Glessula textilis (Blanford, 1866)*#

Super Family: Streptaxoidea
Family: Streptaxidae

Genus: *Streptaxis* Gray, 1837
68. Streptaxis canaricus (Blanford, 1869)*#
69. Streptaxis concinnus (Blanford, 1880)*
70. Streptaxis peroteti (Petit, 1841)#
71. Streptaxis sculptus (Blanford, 1899)*
72. Streptaxis subacutus (Blanford, 1899)*

Genus: *Gluella* H. & A. Adams, 1855
73. Gluella bicolor (Hutton, 1834)#
74. Gluella canarica (Blanford, 1880)*
75. Gluella exilis (Blanford, 1880)*
76. Gluella turricula (Blanford, 1899)*

Sub Order: Orthurethra
Super family: Pupilloidea
Family: Vertiginidae

Genus: *Pupisoma* Stoliczka, 1873
77. Pupisoma evezardi (Blanford, 1875)*#

Super Family: Buluminoidea
Family: Cerastuidae

Genus: *Rachis* Albers, 1850
78. Rachis bengalensis (Lamarck, 1822)#
79. Rachis praetermissus (Blanford, 1861)#

* endemic to Karnataka; # present during the current study

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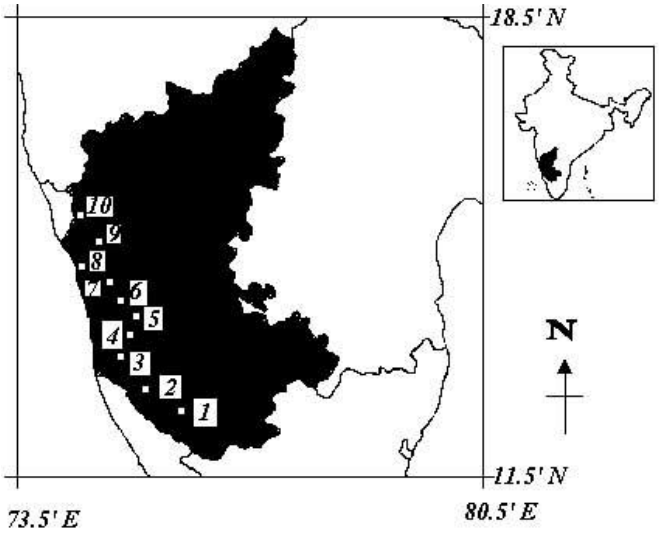

Figure 1. Map of Karnataka with the study areas. 1. Madikeri; 2. Belthangdi; 3. Bisle Ghat; 4. Kudremukh; 5. Agumbe; 6. Sagar; 7. Gersoppa; 8. Karwar; 9. Dandeli; 10. Castle Rock

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SCELIONID FAUNA OF ANNAMALAI UNIVERSITY, ANNAMALAINAGAR, TAMIL NADU

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ABSTRACT
Scelionid diversity of Annamalainagar, Tamil Nadu was surveyed and 23 genera under 13 tribes and three subfamilies were collected and identified. Subfamily Scelioninae is represented by 10 tribes and 17 genera, subfamily Teleasinae by two tribes and two genera and subfamily Telenominae by one tribe and four genera.

KEYWORDS
Annamalai University, Scelionidae, Scelioninae, Tamil Nadu, Teleasinae, Telenominae

Scelionidae (Platygastroidea: Hymenoptera) is a very important family of parasitoids from economic point of view. Many species play significant role in the control of excessive increase in population of several insect pests. They are widely distributed all over the world (Narendran, 2001).

This family is divided into three subfamilies *viz*., Scelioninae, Telenominae and Teleasinae. It contains about 150 known genera and about 3,000 known species in the world (Masner, 1993). Totally 54 genera are known from Oriental Region and 29 genera from India (Masner, 1976). Mani and Mukerjee (1976) described 13 species of different genera of scelionids from India. Gordh and Coker (1973), and, Cave and Gayler (1988) reported the attack of *Geocoris* (Heteroptera: Lygaeidae) eggs by many species of *Telenomus* (Scelionidae: Platygastroidea). Narendran and Ramesh Babu (1996-1997) have provided a key to Indian species of *Calliscelio* Ashmead (Hymenoptera: Scelionidae) and described six new species. Narendran (1998) described a new species of *Calotelia* (Hymenoptera: Scelionidae) and gave a key to five species from India. Narendran and Ramesh Babu (1996) have studied the systematics of *Heptascelio* Kieffer (Hymenoptera: Scelionidae). Rajmohana and Narendran (1997) erected a new subgenus *Neotrimorus* of genus *Trimorus* and also provided a modified key to the genera of Teleasinae.

Scelionids are solitary endoparasitoids of eggs of Lepidoptera, Orthoptera, Diptera, Hemiptera and Arachnida. Occasionally some species are found parasitising eggs of Coleoptera and Neuroptera also (Masner, 1976). Earlier surveys showed that no study has been carried out so far from this region of Tamil Nadu, hence an attempt was made to study the Scelionid fauna of Annamalai University Farm Premises.

STUDY AREA

Annamalai University is located in Chidambaram, Cuddalore district ($11^0$24'N & $79^0$44'E). It lies at an altitude of about 5m. The area receives water from Kollidam river. Temperature varies from 26^0C to 36^0C. The average annual rainfall is 1,200mm mostly from the northeast monsoon (October to December).

MATERIALS AND METHODS

The scelionids were collected from Annamalai University farm

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