

MOLLUSCA

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INTRODUCTION

North-Eastern India, with many hill-streams, ample rainfall and rich wet evergreen forests, accounts for over one third of the total number of species of land and freshwater molluscs, known from India.

From malacological point of view, the Namdapha area has an added importance as it borders India with Burma, as, these area is well known to be the type locality of a number of Indian species of land and freshwater molluscs.

Besides the Fauna of British India (Mollusca) series, works of Godwin-Austen (1876, 1876a, 1914-1918), Blanford and Godwin-Austen (1908), Ghosh (1913), Gude (1914, 1915, 1921), Preston (1915, 1915a) are the important contributions which have dealt with the land and freshwater molluscs of these areas in particular.

The present report deals with the first two lots of molluscs collected during 1981 & 1982, it includes 23 species (18 land and 5 freshwater) involving 20 genera and 10 families, which include 10 new records for Arunachal Pradesh and one new record for India.

SYSTEMATIC ACCOUNT

A. *Land Molluscs*

Class : GASTROPODA

Order : MESOGASTROPODA

Family : CYCLOPHORIDAE

Genus *Alycaeus* Gray, 1850

1. *Alycaeus burti* Godwin-Austen

Alcaeus burti Godwin-Austen, 1874, *J. Asiat. Soc. Beng.*, 43(2) : 149, pl. 3, fig. 9.

Alycaeus burti Godwin-Austen : Gude, 1911, *Fauna of British India, Mollusca* III, p. 206.

Material examined : 2 exs., Deban, 9.xii.82.

Distribution : India : Arunachal Pradesh, Assam.

Elsewhere : Bhutan.

Remarks : Thick, turbinate, openly umbilicate ; with well marked ribbing on the swelling of last whorl and finely costulate at the apex. Whorls 5, spire conoid, aperture oblique, laterally oval, angular on inner upper margin.

2. *Alycaeus daflaensis* Godwin-Austen

Alycaeus daflaensis Godwin-Austen, 1876, *J. Asiat. Soc. Beng.*, 45(2) : 176, pl.7, figs. 12, 12a, 12b.

Alycaeus daflaensis Godwin-Austen, 1921, *Fauna of British India, Mollusca*, III, p. 245.

Material examined : 1 ex., Deban, 15.xii.82.

Distribution : Arunachal Pradesh.

Remarks : It strongly resembles *A. digitatus* from Darjeeling but differs in having a single peristome, instead of double as in *A. digitatus*.

3. *Alycaeus khasiacus* Godwin-Austen

Alycaeus khasiacus Godwin-Austen, 1871, *J. Asiat. Soc. Beng.*, 40(2) : 90, pl. 3, figs. 4, 4a & 4b.

Alycaeus khasiacus Godwin-Austen : Gude, 1921, *Fauna of British India, Mollusca* III, p. 257.

Material examined : 1 ex., Gibbons land, 21.xii.82.

Distribution : India : Arunachal Pradesh, Assam, Meghalaya, Manipur.

Elsewhere : Burma.

Remarks : Though known to occur in North-eastern region, this species is for the first time recorded from Arunachal Pradesh.

Genus *Cyclophorus* Montfort, 1810

4. *Cyclophorus aurantiacus* (Schumacher)

Turbo volvulus Chemnitz, 1786, *Conch. Cab.*, 10(2) : 57, pl. 123, figs. 1064, 1065.

Annularia aurantiaca Schumacher, 1817, *Essai Nouv. Syst. Vers. Test.*, p. 196.

Cyclophorus aurantiacus Schumacher : Gude, 1921, *Fauna of British India, Mollusca*, III, p. 71.

Material examined : 5 exs., Deban, 15.xii.82.

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Kerala,
Elsewhere : Burma, Malay Peninsula.

Remarks : Shell moderately large, solid, depressedly turbate, spirally striate, whorls $5\frac{1}{2}$, flatly convex, body whorl large, obsoletely angulate ; Aperture circular, oblique, umbilicus deep and wide.

It is recorded for the first time from Arunachal Pradesh.

Genus *Leptopoma* Pfeiffer, 1847

5. *Leptopoma sericatum* Pfeiffer

Cyclostoma (Leptopoma) sericatum Pfeiffer, 1851, *Proc. Zool. Soc. Lond.*, p. 244.

Material examined : 2 exs., Gibbons land, 26.xii.82.

Distribution : India : Arunachal Pradesh.

Elsewhere : Borneo.

Remarks : This species is for the first time from India (Arunachal Pradesh).

Genus *Pterocyclus* Benson, 1832

6. *Pterocyclus parvus* (Pearson)

Spiraculum parvus Pearson, 1833, *J. Asiat. Soc. Beng.*, 2 : 592, pl. 20, fig. 7.

Pterocyclus parvus Pearson : Gude, 1921, *Fauna of British India, Mollusca*, III : 108-109.

Material examined : 3 exs., Gibbons land, 22.xii.82.

Distribution : India : Arunachal Pradesh, Assam, Meghalaya, Nagaland.

Elsewhere : Burma, Bangladesh.

Remarks : Shell convexly depressed, openly umbilicate, spire scarcely raised, apex blunt, whorls $4\frac{1}{2}$, sutures impressed, last whorl descending near the aperture, peristome thickened, double, slightly reflected. A sinus like oblique opening (breathing tube), formed by an interruption of the peristome, situated just at a point where the outer lip comes in contact with the penultimate whorl.

Genus *Theobaldius* Nevill, 1878

7. *Theobaldius phaenotopicus* (Benson)

Cyclostoma phaenotopicus Benson, 1851, *Anna. Mag. Nat. Hist.*, (2)8 : 190.

Theobaldius phaenotopicus Benson : Gude, 1921, *Fauna of British India, Mollusca*, III, p. 40.

Material examined : (i) 1 ex., Miao, 2.xii.82 (ii) 1 ex., Gibbons land, 22.xii.82

Distribution : India : Arunachal Pradesh, Sikkim, West Bengal.

Remarks : This species is very much similar to *T. annulatum* Pfeiffer and *T. stenostoma* Sowerby. But it can easily be recognised by its sharp scabrous sculpture, as well as narrower umbilicus. It is recorded for the first time from Arunachal Pradesh.

Order : STYLOMMATOPHORA

Family : CORILLIDAE

Genus *Plectopylis* Benson, 1860

8. *Plectopylis affinis* Gude

Plectopylis affinis Gude, 1897, *Science Gossip*, N. S. 3 : 276, fig. 41.

Material examined : 1 ex., Deban, 1.xii.81.

Distribution : Arunachal Pradesh, Meghalaya.

Remarks : The shell is very coarsely sculptured and covered by a thick, prominently plaited cuticle. It is restricted to North-eastern India only.

Family : FERRUSSACIDAE

Genus *Glessula* Von Martens, 1850

9. *Glessula dikrangense* Godwin-Austen

Glessula illustris Godwin-Austen, 1876, *J. Asiat. Soc. Beng.*, 45(2) : 315.

Glessula dikrangense Godwin-Austen, 1920. *Land and Freshwater molluscs of India*, 3(1) : 26, pl. 160, fig. 7.

Material examined : 1 ex., Deban, 15.xii.82

Distribution : Arunachal Pradesh, Karnataka, Kerala and Maharashtra.

Remarks : Shell elongate, glossy, whorls $8\frac{1}{2}$, rather convex, with fine microscopic striae. Apex obtuse, aperture vertical, columella arched.

While working out a collection, of terrestrial molluscs from Dafla Hills, Godwin-Austen (1876a) had mistakenly placed a few shells of *Glessula* under *G. illustris*. But a thorough re-examination of the material at later date (1920) prompted him to erect a new species (*G. dikrangense*) and include them under this.

Family : SUBULINIDAE

Genus **Opeas** Albers, 1850

10. **Opeas gracile** (Hutton)

Bulinus ? no 5 Hutton, 1834, *J. Asiat. Soc. Beng.*, 3 : 84.

Opeas gracile (Hutton) : Tonapi and Mulherker, *J. Bombay nat. Hist. Soc.*, 60(1) : 113.

Material examined : 1 ex. Gibbons land, 25.xii.82

Distribution : INDIA : Andhra Pradesh, Andaman & Nicobar Island, Assam, Arunachal Pradesh (new record), Bihar, Kashmir, Maharashtra, Punjab, Rajasthan, Tamilnadu, Uttar Pradesh, West Bengal.

Elsewhere : Pakistan, Sri Lanka, Bangladesh, Burma, Malay Peninsula and Archeipelago, Japan, China, Philippines and Polynesia.

Remarks : Shell turreted, thin, transparent or whitish ; spire gradually tapering, apex blunt ; whorls 8-12, very slightly convex, sutures moderately impressed ; aperture higher than broad, semiovate.

Commonly known as garden snail, this cosmopolitan species causes considerable damage to various vegetable plants.

Family : TROCHOMORPHIDAE

Genus **Trochomorpha** Albers, 1850

11. **Trochomorpha castra** (Benson, 1852)

Helix castra Benson, 1852, *Ann. Mag. Nat. Hist.*, (2)10 : 349.

Trochomorpha (*Sivella*) *castra* Benson : Gude, 1924, *Fauna of British India, Mollusca*, 2 : 3.

Material examined : 7 exs., Deban 10.xii.82.

Distribution : INDIA : Assam, Arunachal Pradesh, Meghalaya, Sikkim, West Bengal.

Elsewhere : Burma, Pennang, Malay Peninsula.

Remarks : Shell thin, depressedly conoid, acutely keeled, rather strongly, obliquely striate, whorls 6, a little convex, sutures shallow.

Family : ARIOPHANTIDAE

Genus **Kaliella** Blanford, 1863

12. **Kaliella barrackporensis** (Pfeiffer)

Helix barrackporensis Pfeiffer, 1852, *Proc. Zool. Soc. Lond.*, p. 156.

Kaliella barrackporensis Pfeiffer : Blanford & Godwin-Austen, 1908, *Fauna of British India, Mollusca*, p. 258.

Material examined : 2 exs., Gibbons land, 17.xii.82.

Distribution : INDIA : Arunachal Pradesh (new record), Bihar, Jammu and Kashmir, Maharashtra, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal.

Elsewhere : Madagascar, Sri Lanka, Bangladesh, Burma, Pegu.

Remarks : Shell subperforate, thin, trochiform with oblique striations above. Whorls 6, convex, slowly increased and the last whorl keeled ; suture impressed ; peristome simple, thin, straight ; columellar margin slightly oblique, reflected.

Genus **Khasiella** Godwin-Austen, 1899

13. **Khasiella serrula** (Benson)

Helix serrula Benson, 1836, *J. Asiat. Soc. Beng.*, 5 : 352.

Material examined : (i) 1 ex., Miao, 2.xii.82 (ii) 1 ex., Deban 10.xii.82.

Distribution : Arunachal Pradesh (new record), Himachal Pradesh, Jammu and Kashmir, Meghalaya.

Remarks : The body whorl possesses a strong keel, serrated by transverse plications. This is an intermediate form between the nearly rounded *K. vidua* and the acutely keeled *K. hyba* from Western Himalayas.

Genus **Macrochlamys** Gray, 1847

14. **Macrochlamys dikrangensis** Godwin-Austen

Macrochlamys dikrangensis Godwin-Austen, 1910, *Land and freshwater molluscs of India*, supplement to Theobald & Hanleys, *Conch. Indica*, 2 : 267, pl. 131, fig. 5.

Material examined : 1 ex., Gibbons land, 27.xii.82

Distribution : Arunachal Pradesh.

Remarks : Shell depressedly conoid, sculptured with distinct fine longitudinal irregular striations ; whorls $6\frac{1}{2}$, irregularly increasing ; aperture oblique ; peristome thickened ; lower margin sinuated ; columellar margin very oblique.

This species is known from Arunachal Pradesh only.

15. *Macrochlamys vesica* Godwin-Austen

Macrochlamys vesica Godwin-Austen, 1910, *Land and freshwater molluscs of India*, Supplement to Theobald & Hanleys, *Conch. Indica*, 2 : 248, pl. 118, figs. 2-2c.

Material examined : (i) 4 exs., Deban, 15.xii.82 (ii) 4 exs., Gibbons land, 22.xii.82

Distribution : INDIA : Arunachal Pradesh (new record), Assam, Meghalaya.

Elsewhere : Bangladesh.

Remarks : This species shows much variations in shell characters Godwin-Austen (1910) mentioned that the shells from different localities differ very much which is very apparent to eye, but not easy to define.

Genus *Staffordia* Godwin-Austen, 190716. *Staffordia daflaensis* Godwin-Austen

Helix lubricus Benson ? : Godwin-Austen, 1876, *J. Asiat. Soc., Beng.*, 45(2) : 311, pl. 8, fig. 9.

Staffordia daflaensis Godwin-Austen, 1907, *Moll. India*, 2 : 185, pl. 113, fig. 1-11.

Staffordia daflaensis Godwin-Austen, Blanford & Godwin-Austen, 1908, *Fauna of British India, Mollusca* : 296.

Material examined : 1 ex., Gibbons land, 21.xii.82.

Distribution : The genus *Staffordia* has so far not been recorded from anywhere outside Arunachal Pradesh.

Remarks : Shell is very similar to that of *Macrochlamys*. Caudal gland at the extremity of the foot absent, sole of foot not divided.

Family : CAMAÆINIDAE

Genus : *Amphidromus* Albers, 185017. *Amphidromus masoni* (Godwin-Austen)

Bulimus masoni Godwin-Austen, 1876, *J. Asiat. Soc. Bang.*, 45 : 316.

Amphidromus masoni (Godwin-Austen) : Gude, 1914, *Fauna of British India, Mollusca*, II, p. 181.

Material examined : 1 ex., Gibbons land, 21.xii.82

Distribution : INDIA : Arunachal Pradesh, Assam.

Remarks : Shell sinistral, elongate, microscopically striate. greenish-white, whorls 7, with rather flat sides, body whorl angulate,

columella and lips dark purple, a very narrow band of same color encircles the shell just below the sutures. Aperture oval; angular above, lip moderately reflected.

Genus **Landouria** Godwin-Austen, 1918

18. **Landouria huttoni** (Pfeiffer)

Helix orbicula Hutton, 1838, *J. Asiat. Soc. Bang.* 7 : 217.

Helix huttoni Pfeiffer, 1842, *Symb. Hist.*, 2 : 82.

Plectotropis huttoni Pfeiffer : Gude, 1974, *Fauna of British India*, II : 211.

Landouria huttoni (Pfeiffer) : Godwin-Austen, 1918, *Rec. Indian Mus.*, 8 : 605, text figs. 2A. A and 3.

Material examined : (i) 2 exs., Miao, 3.xii.82 (ii) 2 exs., Deban, 13.xii.82.

Distribution : India : Arunachal Pradesh, Himachal Pradesh, Jammu & Kashmir, Nagaland, West Bengal.

Elsewhere : Burma, China.

Remarks : Shell orbiculate, whorls 6, slightly convex, the body whorl angulate and scarcely descending; aperture oblique, roundly lunate; columellar margin slightly reflected; peristome simple.

B. *Freshwater Molluscs*

Order : MESOGASTROPODA

Family : THIARIDAE

Genus **Brotia** H. Adams, 1866

19. **Brotia costula** (Rafinesque)

Melania costula Rafinesque, 1833, *Atlantic J.* no. 5, p. 166.

Melania variabilis Benson, 1836, *J. Asiat. Soc. Beng.*, 5 : 746.

Material examined : 14 exs., Gibbons land, 22.xii.82

Distribution : INDIA : Arunachal Pradesh (new record), Assam, Uttar Pradesh, West Bengal.

Elsewhere : Pakistan, Burma, Sumatra.

Remarks : This species shows much variation in shell characters, which has resulted in a large number of varieties and subvarieties being named by different authors. However, these varieties are not constant and regularly intergrade into each other.

Genus *Paludomus* Swainson, 184020. *Paludomus conica* Gray

Melania conica Gray, 1850, *Griff. ed Cuvier Moll.*, pl. 14, fig. 5.

Material examined : (i) 1 ex. Em Pen, 27.xii.81 (ii) 5 exs., Em Pen, 27.xii.82 (iii) 5 exs., Miao, 2.xii.82.

Distribution : INDIA : North-eastern India.

Elsewhere : Bhutan, Bangladesh.

Remarks : This species shows considerable variation in shell characters. Among the material studied, five shells from Miao differ from others by possessing rather conspicuous umbilical pore and slightly broader aperture.

Collected from streams with muddy substratum.

Order : BASOMMATOPHORA

Family : LYMNAEIDAE

Genus *Lymnaea* Lamarck, 1911

21. *Lymnaea (Pseudosuccinea) acuminata* f. *typica* (Lamarck)

Limnaea acuminata Lamarck, 1822, *Hist. nat. Anim. Sans. Vert.*, 6(20) : 160.

Limnaea acuminata Lamarck : Annandale & Rao, 1925, *Rec. Indian Mus.*, 27 : 177.

Material examined : 5 exs., Em Pen, 19.xii.82

Distribution : INDIA : Widely distributed.

Elsewhere : Pakistan, Bangladesh, Burma.

Remarks : Shell thin, ovate, spire short, acuminate, body whorl much inflated a little angular, with a large aperture, columella twisted.

Collected from a small stream with a little flow of water and muddy substratum.

Family : PLANORBIDAE

Genus *Segmentina* Fleming, 1817

22. *Segmentina calatha* (Benson)

Planorbis calatha Benson, 1850, *Ann. Mag. Nat. Hist.*, (2)5 : 348.

Planorbis (Segmentina) calatha (Benson) : Preston, 1915, *Fauna of British India, Mollusca (Freshwater)* p. 127.

Segmentina calatha (Benson) : Germain, 1923, *Rec. Indian Mus.*, 21 : 168.

Material examined : 5 exs., Gibbons land, 27.xii.82

Distribution : INDIA : Arunachal Pradesh, Bihar, Himachal Pradesh, Manipur, Uttar Pradesh, West Bengal.

Elsewhere : Sri Lanka and Burma.

Remarks : This species is for the first time recorded from Arunachal Pradesh.

Collected from stagnant water with ample aquatic vegetations.

Class : BIVALVIA

Order : UNIONOIDA

Family : UNIONIDAE

Genus *Parreysia* Conard, 1853

23. *Parreysia (Radiatula) lima* Simpson

Nodularia (Radiatula) lima Simpson, 1900, *Proc. U. S. nat. Mus.*, 22 : 820.

Nodularia (Radiatula) lima Simpson : Preston, 1955, *Fauna of British India, Mollusca (Freshwater)*, p. 147.

Indonata lima (Simpson) : Prashad, 1921, *Rec. Indian Mus.*, 22 : 60.

Material examined : 2 valves, from a stream near Gibbons land, 26.xii.82

Distribution : Arunachal Pradesh (new record), Assam, Sikkim, West Bengal.

Remarks : Shell variable in form and sculpture. The corrugations in some cases are confined to umbonal region whereas in others these are extended over the whole surface of the shell. Shape varies from trapezoidal to ovate.

Collected from streams with muddy substratum.

SUMMARY

Out of the 18 species of land molluscs studied, 10 species, viz. *Alycaeus burti* Godwin-Austen, *A. daflaensis* Godwin-Austen, *A. khasicus* Godwin-Austen, *Leptopoma sericatum* Pfeiffer, *Pterocyclus affinis* Gude, *Glessula dikrangense* Godwin-Austen, *Macrochlamys dikrangensis* Godwin-Austen, *M. vesica* Godwin-Austen, *Staffordia daflaensis* Godwin-Austen and *Amphidromus masoni* Godwin-Austen, are restricted to North-Eastern India. Four species among these, (*A. daflaensis*, *L. sericatum*, *M. dikrangense* and *S. daflaensis*) are confined to Arunachal Pradesh alone. The genus *Staffordia* is endemic to Arunachal Pradesh.

Eight species viz., *A. khasiacus* Godwin-Austen, *C. aurantiacus* (Schumacher), *L. sericatum* Pfeiffer, *Theobaldius phaenotopicus* (Benson), *Opeas gracile* (Hutton), *K. serrula* (Benson), *K. barrackporensis* (Pfeiffer) and *M. vesica* Godwin-Austen are new records for the state of Arunachal Pradesh. Incidentally, the species *L. sericatum* is, for the first time, recorded from India.

Of the 5 species of freshwater molluscs, *Parreysia (Radiatula) lima* Simpson, a bivalve, was hitherto known from the eastern states of Assam, Sikkim and West Bengal and is a new record from Arunachal Pradesh. All the remaining 4 species have a wide range of distribution throughout India.

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