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MALACOFAUNA OF JABALPUR

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Zoological Survey of India

INTRODUCTION

Jabalpur, with her unique ecological condition, offers an ideal habitat to a rich fauna of molluscs. But till date, no comprehensive report dealing with the land and freshwater molluscs of Jabalpur in particular is available except some work of Agrawal (1976, 1977). The present work attempts to provide an uptodate document on the land and freshwater molluscs of Jabalpur, taking into account the recent changes made in nomenclature and classification.

Topography : Jabalpur, situated on the shores of holy river Narmada and lying in plains of tributaries Hiran, Gour, Ken and Sone. There are Kariapather hillock to the northeast, Sita Pahad and Khandari hills to the east, Madan Mahal hills and rocks outcrops to the southwest. The main water reservoir of Khandari and Pariyat are located to the northeast direction of the city. Several lakes and water tank used for culture surround the town its cardinal points are 23°10' N latitude and 79°57' E longitude, on Deccan Plateau with height of 393 meters and surrounded on all sides by most ancient basalt rocks with thick forest all round having about 1386-mm/yr rainfall. The highest maximum temperature recorded is 46.7°C while the lowest minimum was zero degree Celcius.

THE CLASSIFICATION FOLLOWED HERE IS AFTER VAUGHT (1989)

SYSTEMATIC LIST

Freshwater Molluscs

Class GASTROPODA

Subclass PROSOBRANCHIA

Order MESOGASTROPODA

Family 1. AMPULLARIIDAE

Genus *Pila* (Bolten) Roeding, 1798

- (i) *Pila globosa* (Swainson)
- (ii) *Pila virens* (Lamarck)*

Family 2. VIVIPARIDAE

Genus **Bellamyia** Jousseume, 1886

- (iii) *Bellamyia bengalensis f. mandiensis* (Kobelt)
- (iv) *Bellamyia dissimilis* (Mueller)

Family 3. THIARIDAE

Genus **Tarebia** H. and A. Adams, 1854

- (v) *Tarebia lineata* (Gray)*

Subclass PULMONATA

Order BASOMMATOPHORA

Family 4. LYMNAEIDAE

Genus **Lymnaea** Lamarck, 1799

- (vi) *Lymnaea (Pseudosuccinea) acuminata f. typica* (Lamarck)
- Lymnaea (Pseudosuccinea) acuminata f. brevissima* (Annandale & Rao)
- Lymnaea (Pseudosuccinea) acuminata f. patula* (Troschel)
- Lymnaea (Pseudosuccinea) acuminata f. rufescens* (Gray)
- (vii) *Lymnaea (Pseudosuccinea) luteola f. ovalis* (Gray)
- Lymnaea (Pseudosuccinea) luteola f. australis* (Annandale & Rao)
- Lymnaea (Pseudosuccinea) luteola f. impura* (Troschel)

Family 5. PLANORBIDAE

Genus **Indoplanorbis** Deshayes, 1834

- (viii) *Indoplanorbis exustus* (Deshayes)

Class BIVALVIA

Subclass PTERIOMORPHIA

Order UNIONOIDA

Superfamily UNIONACEA

Family 6. UNIONIDAE

Genus **Lamellidens** Simpson, 1900

- (ix) *Lamellidens corrianus* (Lea)
- (x) *Lamellidens marginalis* (Lamarck)

Genus **Parreysia** Conrad, 1853Subgenus **Parreysia s.str.**

- (xi) *Parreysia (Parreysia) favidens* (Benson)
- (xii) *Parreysia (Parreysia) corrugata* (Mueller)

Subgenus ***Radiatula*** Simpson, 1900

(xiii) *Parreysia (Radiatula) andersoniana* (Nevill)

(xiv) *Parreysia (Radiatula) caerulea* (Lea)

Subclass HETERODONTA

Order VENEROIDA

Family 7. CORBICULIDAE

Genus ***Corbicula*** Megerle Vou Muehlfeld, 1811

(xv) *Corbicula inflata* (Clessin)*

(xvi) *Corbicula occidens* (Deshayes)*

(xvii) *Corbicula picta* (Clessin)*

(xviii) *Corbicula striatella* (Deshayes)

Land Molluscs

Class GASTROPODA

Subclass PROSOBRANCHIA

Order STYLOMMATOPHORA

Family 8. CERASTUIDAE

Genus ***Rhachis*** Albers, 1850

(xix) *Rhachis bengalensis* (Lamarck)*

(xx) *Rhachis punctatus* (Anton)

Family 9. ARIOPHANTIDAE

Genus ***Euplecta*** Semper, 1870

(xxi) *Euplecta acuducta* (Benson)*

Family 10. SUBULINIDAE

Genus ***Glessula*** von Martens, 1860

(xxii) *Glessula mullorum* (Blanford)

(xxiii) *Glessula paaupercula* (Blanford)

Genus ***Opeas*** Hutton, 1834

(xxiv) *Opeas gracile* (Hutton)

Genus ***Zootecus*** Westerland, 1867

(xxv) *Zootecus insularis* (Ehrenberg)

Genus *Subulina* Beck, 1837

(xxvi) *Subulina octona* (Bruguiere)

Subclass GYMNOMORPHA

Order SOLEOLIFERA

Family 11. VERONICELLIDAE

Genus *Filicaulis* (Smiroth)

(xxvii) *Filicaulis (Eleutherocaulis) alte* (Ferussac)

*Recorded from literature only.

Key to the families of freshwater molluscs

1. Shell with a single valve 2
 - Shell with two valves 6
2. Shell operculate 3
 - Shell without an operculum 5
3. Operculum with concentric growth lines 4
 - Operculum with spiral growth lines THIARIDAE
4. Operculum calcareous AMPULLARIIDAE
 - Operculum horny VIVIPARIDAE
5. Shell elongate with a distinct spire, columellar axis typically twisted LYMNAEIDAE
 - Shell discoidal, spire depressed, columellar axis not twisted PLANORBIDAE
6. Shell ovately trigonal with concentric sculpture CORBICULIDAE
 - Shell subrhomboid or transversely elongate, without concentric sculpture UNIONIDAE

Key to the families of land molluscs

1. Animal slug like, without a shell VERONICELLIDAE
 - Animal covered by a shell 2
2. Shell elongately ovate to turreted, distinctly higher than broad 3
 - Shell depressed to depressedly turinate, broader than high ARIOPHANTIDAE
3. Shell broad ovate, usually with bands CERASTUIDAE
 - Shell narrow, cylindrically turreted without bands SUBULINIDAE

SYSTEMATIC ACCOUNT
FRESHWATER MOLLUSCS

Class GASTROPODA

Subclass PROSOBRANCHIA

Order MESOGASTROPODA

Family 1. AMPULLARIIDAE

Genus *Pila* (Bolten) Roeding, 1798

1798. *Pila* (Bolten) Roeding, Museum Boltenianum, pt. 2. p. 145 (in part)

1989. *Pila* (Bolten) Roeding : Subba Rao. *Handbook Freshwater Molluscs of India.*, p. 57.

Shell large or very large, globose, smooth, spire short, aperture large, body whorl inflated, umbilicus usually open, operculum thick, calcareous. Amphibious in habit.

Pila globosa (Swainson)

1822. *Ampullaria globosa* Swainson, *Zool. illustration*, Vol. 2, pl. cxix.

1989. *Pila globosa* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 58, fig. 80.

Materials examined : (i) 4 exs., Deval, 18.07.1960; (ii) 4 exs., Jabalpur-Nagpur road, 18.07.1960, (iii) 3 exs., Pachpedi, 19.07.1960; (iv) 3 exs., Chamanpur about 10 kms. on Bhedaghat road, 28.10.1960, Coll. S. Chakrapany.

Diagnosis : Shell globose, very smooth, olive, spire depressed, margin of the aperture thick, fulvous, grooved umbilicus small, contracted, placed near the base.

Distribution : INDIA : Madhya Pradesh, Assam, Bihar, Maharashtra, Orissa, Uttar Pradesh and West Bengal.

Family 2. VIVIPARIDAE

Genus *Bellamya* Jousseau

1886. *Bellamya* Jousseau, *Bull. Soc. Zool., France*, II : 478.

1989. *Bellamya*, Subba Rao, *Handhook Freshwater Molluscs of India*, p. 44.

Shell oblong, rather thin with bands or faint spiral striae, adult shell usually without ridges or spines. Body whorls rounded or subangulate, rarely keeled, aperture subcircular, peristome simple. Operculum thin, nucleus sublateral. Right tentacle in male short and curved. Ovoviviparous. Inhabits stagnant water.

Key to the species

1. Shell with dark spiral bands*B. bengalensis f. mandiensis* (Kobelt)
- Shell without any spiral bands*B. dissimilis* (Mueller)

***Bellamyia bengalensis f. mandiensis* (Kobelt)**

1909. *Viviparus bengalensis* var. *mandiensis* Kobelt, *Nachr. Malak. Ges.* **60** : 414 In Martini Chemnitz. *Conch. Cab.* **2** : 414, pl. 77, fig. 8-9.

1989. *Bellamyia bengalensis f. mandiensis*, Subba Rao, *Handbook Freshwater Molluscs of India*, P. 45, fig. 56.

Materials examined : (i) 9 exs., Gour river on Jabalpur Mandla road, 27.05.1961, Coll. D. Banerjee; (ii) 23 exs., Bhilonda village, about 20 kms from ZSI C.R.S. 25.07.1961, 1 ex., Vedinagar Nagpur road, 6.02.1962, 1 ex., Tewar village, 31.10.1962, Coll. P. Singh; (iii) 1 ex., Narmada river, Jabalpur 31.10.1962, Coll. R.C. Sharma.

Diagnosis : Spire more conical and little narrower than typical form, aperture not quite so broad, but more projecting, umbilicus broader, well developed alternating broad and narrow spiral bands.

Distribution : INDIA : Madhya Pradesh, common to northwestern India from Allahabad to Punjab and west to Mumbai.

***Bellamyia dissimilis* (Mueller)**

1774. *Nerita dissimilis* Mueller, *Hist. Verm. Test.* pt. 2 : 184. Type-locality : Not given.

1989. *Bellamyia dissimilis*, Subba Rao, *Handbook Freshwater Molluscs of India*, p. 48, figs. 64-67.

Materials examined : 7 exs., Garha area, 30.08.1961. Coll. P. Singh.

Diagnosis : Shell somewhat conic, smaller, narrowly and deeply umbilicate. Without dark spiral bands. With faint microscopic spiral striae. Body whorl subangulate at the periphery, rim of aperture often black.

Distribution : INDIA : Madhya Pradesh, Orissa, Pondicherry and common throughout India. *Elsewhere* : Bangladesh; Malaysia; Myanmar; Pakistan and Srilanka.

Subclass PULMONATA

Order BASOMMATOPHORA

Family 4. LYMNÆIDAE

Genus *Lymnaea* Lamarck

1799. *Limnaea* Lamarck, *Prodr. Nouv. Clas. Coq.*, p. 75.

1989. *Lymnaea*, Subba Rao, *Handbook Freshwater Molluscs of India*, p. 124.

Shell ovate, thin, with a large body whorl, spire exerted usually large, columella spirally twisted. Inhabits all types of freshwater habitat as including temporary water bodies.

Key to the species

1. The outerlip very much expanded and convex in outline, spire short and acuminate
..... *L. acuminata* (Lamarck)
- The outerlip not very much expanded, spire longer, less acuminate *L. luteola* (Gray)

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

1822. *Limnaea acuminata* Lamarck, *Hist. nat Anim. Sans, Vert.* **6**(2) : 160. Type-locality : "Bengale".

1989. *Lymnaea (Pseudosuccinea) acuminata f. typica*, Subba Rao, *Handbook Freshwater Molluscs of India*, p. 127. figs. 258-259.

Materials examined : 1 ex., 29.06.1964. Coll. S. Chakrapany.

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

Distribution : INDIA : Madhya Pradesh and common throughout India. *Elsewhere* : Bangladesh, Myanmar and Pakistan.

Lymnaea (Pseudosuccinea) acuminata f. rufescens (Gray)

1820. *Limnaea rufescens* Gray, in Sowerby's *Genera of Recent & fossil shells*, **1**(7) : *Limnaea*. fig. 2.

1989. *Lymnaea (Pseudosuccinea) acuminata f. rufescens*, Subba Rao, *Handbook Freshwater Molluscs of India*, p. 127. Figs. 254-255.

Materials examined : 1 ex., 6.02.1962 Coll. S. Chakrapany.

Diagnosis : Shell uniformly narrowly elongate with a long spire, aperture uniformly less expanded and broadly angulate above.

Distribution : INDIA : Madhya Pradesh and common throughout India. *Elsewhere* : Bangladesh, Myanmar and Pakistan.

Lymnaea (Pseudosuccinea) acuminata f. patula (Troschel)

1837. *Limnaea patula* Troschel, in Weigman's *Archiv. fur. Naturg.* **3** : 167.

1989. *Lymnaea (Pseudosuccinea) acuminata f. patula*, Subba Rao, *Handbook Freshwater Molluscs of India*, p. 126. Figs. 256-257.

Materials examined : (i) 1 ex., Amarkantak, 29.06.1964, Coll. S. Chakrapany; (ii) 1 ex., Tewar village, 29.06.1964, Coll. P. Singh.

Diagnosis : Shell narrower than in *typica*, spire relatively large, anterior extremity of aperture tapering.

Distribution : INDIA : Madhya Pradesh and common throughout rest of India.

Lymnaea (Pseudosuccinea) acuminata f. brevissima (Annandale & Rao)

1925. *Limnaea acuminata* Annandale & Rao, *Rec. Indian Mus.*, **27** : 182, fig. III-1.

1989. *Lymnaea (Pseudosuccinea) acuminata f. brevissima*, Subba Rao, *Handbook Freshwater Molluscs of India*, p. 126.

Materials examined : 1 ex., Jabalpur, 6.02.1962, Coll. S. Chakrapany.

Diagnosis : This form is closely related to the *L. acuminata* but differs in the spire being still further reduced with less than 3 whorls in the spire. According to Annandale & Rao (1925) this feature is apparently an abnormality.

Distribution : INDIA : Madhya Pradesh and Maharashtra.

***Lymnaea (Pseudosuccinea) luteola f. ovalis* (Gray)**

1820. *Limnaea ovalis* Gray, In Sowerby's Genera of Shells, 1 : *Limnaea*, fig. 4.

1989. *Lymnaea (Pseudosuccinea) acuminata f. ovalis*, Subba Rao, *Handbook Freshwater Molluscs of India*, p. 128, figs. 266, 267, 283, 284.

Materials examined : 1 ex., Lamaghat, Narmada river, 29.06.1964, Coll. S. Chakrapany.

Diagnosis : Shell subglobose, body whorl globosely inflated without any compression, spire short and abruptly pointed or acuminate.

Distribution : INDIA : Madhya Pradesh & rest throughout India. *Elsewhere* : Myanmar and Srilanka.

***Lymnaea (Pseudosuccinea) luteola f. australis* (Annandale & Rao)**

1925. *Limnaea (Pseudosuccinea) f. australis* Annandale & Rao, *Rec. Indian Mus.*, 27 : 184.

1989. *Lymnaea (Pseudosuccinea) luteola f. australis*, Subba Rao, *Handbook Freshwater Molluscs of India*, p. 128, figs. 279-280.

Materials examined : 1 ex., Paharikhera, Jabalpur, 26.02.1963, Coll. J.S. Bhatti.

Diagnosis : A smaller form, spire comparatively longer, body whorl well-rounded, sutures rather shallow.

Distribution : INDIA : Madhya Pradesh and rest throughout India. *Elsewhere* : Bangladesh, Myanmar, Pakistan and Srilanka.

***Lymnaea (Pseudosuccinea) luteola f. impura* (Troschel)**

1837. *Limnaea impurus* Troschel in Weigman's *Archiv fur. Naturg.* 3 : 172.

1989. *Lymnaea (Pseudosuccinea) luteola f. impura*, Subba Rao, *Handbook Freshwater Molluscs of India*, p. 128, 129, figs. 281-282.

Materials examined : 1 ex., Mandla road, Jabalpur, 3.10.1962, Coll. P. Singh.

Diagnosis : Differs from the typical form in being narrower and the spire being a little more pointed. The apical portion very often appears black.

Distribution : INDIA : Madhya Pradesh and rest throughout India. *Elsewhere* : Myanmar and Srilanka.

Family 5. PLANORBIDAE

Genus *Indoplanorbis* Annandale & Prashad

1921. *Indoplanorbis* Annandale & Prashad. *Rec. Indian Mus.* **22**(4) : 578.

Animal sinistral, foot relatively broad and short. leaf shaped, broadly rounded anteriorly and pointed posteriorly. Branchial process lobed. The genus is monotypic.

Indoplanorbis exustus (Deshayes)

1834. *Planorbis exustus* Deshayes, *Voy. Belang. Indo. Orient Zool.*, p. 417, pl. 1, figs. 11-13.

1989. *Indoplanorbis exustus* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 142. figs. 326-327.

Materials examined : 6 exs., Baltara village, Sagar road, 19.01.1962. Coll. S. Chakrapany.

Diagnosis : Shell greenish brown, finely ridged, spire rather flattened, whorls 3, last large, aperture angularly raised, then depressed, sloped, expanded below, rather produced.

Distribution : Madhya Pradesh, Throughout the plains of India. *Elsewhere* : Celebes, Indochina, Java, Malaya, Myanmar, Pakistan, Persia, Srilanka and Thailand.

Class BIVALVIA

Subclass PTERIOMORPHIA

Order UNIONOIDA

Superfamily UNIONACEA

Family 6. UNIONIDAE

Key to the genera

1. Shell thin and broadly elongate, cardinals compressed elongate, lamellar teeth long
Lamellidens (Simpson)
- Shell thick and rounded to subrhomboid, tumid, cardinals heavy, vertically striate, lamellar teeth short *Parreysia* (Conrad)

Genus *Lamellidens* Simpson

1900. *Lamellidens* Simpson, *Proc. U.S. natn. Mus.*, (Washington), **22** : 854.

1989. *Lamellidens* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 164.

Exhalent aperture with a row of minute tubercles in its extreme lateral margins, inhalant aperture with a single row of short and stout tentacles.

Key to the species

1. Shell oblong-ovate, periostracum with a light brown border *L. marginalis* (Lamarck)
- Shell narrow, elliptical, periostracum uniformly dark brown *L. corrianus* (Lea)

***Lamellidens corrianus* (Lea)**

1834. *Unio corrianus* Lea, *Trans. Amer. Philos. Soc.*, **6**(2) : 65, pl. 9, fig. 25. Type-locality : India.

1989. *Lamellidens corrianus* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 165. figs. 386-387.

Materials examined : 1 ex., Pariyat tank, 23.06.1961, Coll. R.C. Sharma.

Diagnosis : Shell narrow, elliptical, transverse, very inequilateral, subangular behind, valves very thin, beaks scarcely prominent, cardinal teeth thin and bladed, 2 cardinals in each valve, lateral teeth long, thin and nearly straight, nacre pearly white and iridescent. Periostracum smooth and dark brown.

Distribution : INDIA : Madhya Pradesh, Tamilnadu, West Bengal. *Elsewhere* : Bangladesh and Myanmar.

***Lamellidens marginalis* (Lamarck)**

1819. *Unio marginalis* Lamarck, *Hist. Nat. Anim. Sans. Vert.*, **4** : 39. Type-locality : Bengal.

1989. *Lamellidens marginalis* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 168. figs. 404-405.

Materials examined : 2 exs., Shahpura Railway Bridge, 12.05.1962, Coll. V.S. Durve.

Diagnosis : Shell oblong ovate, valves covered with periostracum of blackish brown with a light brown border on the ventral margin. Umbo not elevated, posterior side broad, roundly angular, margins produced to a narrow wing, dorsal margin slightly curved, ventral margin slightly contracted in middle, hinge with two cardinals in right valve, interior nacreous.

Distribution : INDIA : Madhya Pradesh, widely distributed in India. *Elsewhere* : Bangladesh, Myanmar and Srilanka.

Genus *Parreysia* Conrad

1853. *Parreysia* Conrad, *Proc. Acad. nat. sci. Philad.*, **6** : 267.

1989. *Parreysia* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 180.

Shell heavy and inflated, rounded to subrhomboidal with distinct radial zig zag ribs on beaks, periostracum smooth, cardinals heavy, ragged or vertically striate, lamellar teeth short, cavity of beaks somewhat deep. All 4 gills marsupial, supra anal opening rather widely separated from the anal, the inner lamina of the inner gill entirely connected with the abdominal etc.

Key to the subgenus

1. Shell with centre of ventral margin swollen, thick, beak sculpture strong *Parreysia* s.st.
- Shell with almost straight ventral margin, comparatively thin, beak sculpture not strong, surface covered with radiating or zig zag shaped or divaricate ridges *Radiatula* Simpson

Subgenus *Parreysia* s.str.**Key to the species**

1. Shell scarcely inequilateral *P. (P.) corrugata* (Mueller)
 – Shell more inequilateral *P. (P.) favidens* (Benson)

***Parreysia (Parreysia) favidens* (Benson)**

1862. *Unio favidens* Benson, *Ann. Mag. Nat. Hist.*, (3)10 : 188. Type-locality : Bhitoura on the Ganges between Cawnpore and Allahabad.

1989. *Parreysia favidens* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 180. figs. 466, 467, 484, 485.

Materials examined : (i) 3 exs. Pariyat Tank, 23.06.1961, Coll. S. Chakrapany; (ii) 1 ex., Damoh, 3.10.1962, Coll. H. Khajuria.

Diagnosis : Shell thick and heavy, inflated, with strong zig zag ribs on beak, inequilateral and angulate both on anterior and posterior margin, cardinal teeth strong and broad.

Distribution : INDIA : Madhya Pradesh and rest of India. *Elsewhere* : Bangladesh and Pakistan.

***Parreysia (Parreysia) corrugata* (Mueller)**

1774. *Mya corrugata* Mueller, *Verm. Terr. Et. Fluv.*, pt. 2, p. 214. no. 398. Type-locality : Rivers of Coromandel.

1989. *Parreysia (Parreysia) corrugata* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 179. figs. 448-449.

Materials examined : 1 ex., Damoh, 3.10.1962, Coll. H. Khajuria.

Diagnosis : Shell green, elliptical to oval, scarcely inequilateral, smooth, umbones prominent, sculptured with somewhat radiating, oblique, linear ridges, ventral margin convex, lunule well marked, cardinal teeth strong, not lamellar.

Distribution : A common species with a wide range of distribution. Madhya Pradesh, Andhra Pradesh, Bihar, Karnataka, Maharashtra and Punjab. *Elsewhere* : Bangladesh.

Subgenus *Radiatula* Simpson, 1900**Key to the species**

1. In mature forms the entire shell is sculptured *P. (R.) andersoniana* (Nevill)
 – In mature forms only umbonal region is sculptured *P. (R.) caerulea* (Lea)

Parreysia (Radiatula) andersoniana (Nevill)

1877. *Unio andersoniana* Nevill, *J. Asiat. Soc. Beng.*, **46** : 40. Type-locality : Myadong, Upper Burma.

1989. *Parreysia (Radiatula) andersoniana* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 187. figs. 508-509.

Materials examined : 1 ex., Gwarighat, 24.06.1964, Coll. D.N. Basu.

Diagnosis : Easily distinguished by more irregular shape, thinner texture, by the acute angulation, greater production posteriorly and by the more developed sculpture, umbo indistinct, pallial line prominent.

Distribution : INDIA : Madhya Pradesh, Assam and West Bengal. *Elsewhere* : Myanmar.

Parreysia (Radiatula) caerulea (Lea)

1831. *Unio caerulea* Lea, *Trans. Amer. Phil. Soc.*, **4** : 95.

1989. *Parreysia (Radiatula) caerulea* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 188. figs. 516-517.

Materials examined : 1 ex., Jabalpur, Gwarighat, 24.06.1964, Coll. D.N. Basu.

Diagnosis : Shell comparatively thin, elongated than the preceding species, ventral margin more or less straight, beak not strongly sculptured, highly variable in shape and structure, posterior umbonal carina very distinct, in young shells the whole umbonal region is sculptured with zig zag ribs.

Distribution : INDIA : Madhya Pradesh Assam, Bihar, Orissa, Punjab, Uttar Pradesh and West Bengal. *Elsewhere* : Bangladesh, Myanmar, Nepal and Pakistan.

Subclass HETERODONTA

Order VENEROIDA

Family 7. CORBICULIDAE

Genus ***Corbicula*** Megerle von Muehlfeld

1811. *Corbicula* Megerle von Muehlfeld, *Mag. Gesell. Naturf.*, Berlin, **5** : 56.

1989. *Corbicula* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 200.

Shell subtrigonal, thick, with strong concentric ribs, prominent and centrally placed umbone, ligament prominent and external, hinge with three cardinal teeth in each valve, lateral teeth elongated.

Corbicula striatella (Deshayes)

1854. *Corbicula striatella* Deshayes, *Proc. Zool. Soc. London*, **22** : 344. Type-locality : Pondicherry.

1989. *Corbicula striatella* : Subba Rao, *Handbook Freshwater Molluscs of India*, p. 204. figs. 575-576.

Materials examined : (i) 3 exs., Pariyat river at Maharajpur village, 7.05.1963, Coll. S. Chakrapany; (ii) 1 ex., Bheraghat, 3.10.1962, 4 exs., Gour river south of Gouriyaaghat, 15.06.1963, Coll. H. Khajuria; (iii) 11 exs., Narmada river south west of Bilpathar village, 26.03.1964, Coll. J.S. Bhatti.

Diagnosis : Shell thick of moderate size, tumid, ovately triangular, shining brown, very strongly concentrically ribbed, umbo distinctly raised.

Distribution : INDIA : Madhya Pradesh and common throughout India. *Elsewhere* : Myanmar and Pakistan.

LAND MOLLUSCS

Class GASTROPODA

Subclass PROSOBRANCHIA

Order STYLOMMATOPHORA

Family 8. CERASTUIDAE

Genus *Rhachis* Albers

1850. *Rhachis* Albers, *Die Helicien.*, p. 164. (= *Rachis* auctt.-err)

2004. *Rhachis* : Mitra, Dey and Ramakrishna, *Pictorial Handbook on Indian Land Snails*, p. 139.

Shell elongate, deeply umbilicate, dextral, smooth, usually with bands, aperture ovately elongate, columellar margin straight, expanded and strongly reflected partially covering the umbilicus. Peristome simple with straight margins.

Mostly arboreal in habit. Two species have been found in Jabalpur.

Rhachis punctatus (Anton)

1839. *Bulimus punctatus* Anton, *Verz. Conch.*, p. 42.

2004. *Rhachis punctatus* : Mitra, Dey and Ramakrishna, *Pictorial Handbook on Indian Land Snails*, p. 140, figs. C31.

Materials examined : 3 exs., Pachpedi, 5.01.1964, Coll. H.P. Agrawal.

Diagnosis : Shell ovately conical, distinctly perforate, marked with transverse streaks throughout and a single narrow chocolate band below the periphery, pale white, whorls 7-8, fairly rounded, last whorl with single band, rarely an indistinct second band exists, apex acute, aperture ovate, peristome slightly thickened, columella dilated and reflected. Differs being more conical and narrower, having the transverse streaks throughout and also possessing a single band instead of 3-4.

Distribution : INDIA : Madhya Pradesh, Jharkhand, Maharashtra, Orissa, Uttar Pradesh, West Bengal and the whole of South India. *Elsewhere* : Africa and Srilanka.

Family 10. SUBULINIDAE

Key to the genus

1. Columella truncate below, not continuous with basal lip (2)
 - Columella rounded below, continuous with basal lip (3)
2. Columella obliquely truncate, sutures crenulated, outer lip sharp *Subulina* Beck
 - Columella abruptly truncate, sutures simple, outer lip blunt *Glessula* von Martens
3. Shell striate or decussate, peristome thickened *Zootecus* Westerland
 - Shell smooth except some weak striae, peristome thin *Opeas* Albers

Genus *Glessula* von Martens

1860. *Glessula* von Martens, *Die Heliceen.*, 2 : 254.

2004. *Glessula* : Mitra, Dey and Ramakrishna, *Pictorial Handbook on Indian Land Snails*, p. 156.

Shell small to moderate, imperforate, rather narrowly elongate to cylindrical, with a blunt apex, Smooth (without strong sculpture) aperture ovate. Peristome simple, columella deeply concave, truncates at the base. Sole of the foot without distinct median area, pedal margin absent.

Inhabits moist shady places with plenty of foliage etc. Many of the species are ovo-viviparous in nature.

Key to the species

1. Aperture pyriform, peristome internally slightly labiate, whorls 7 ... *G. paupercula* (Blanford)
 - Aperture semicircular, peristome obtuse, whorls 6 *G. mullorum* (Blanford)

Glessula paupercula (Blanford)

1861. *Glessula paupercula* Blanford, *J. Asiat. Soc. Beng.*, 30 : 62. pt. 1, fig. 16.

Materials examined : 2 exs., Jabalpur, Rani Durgavati Samadhi, 25.09.1966, Coll. H.P. Agrawal.

Diagnosis : Shell narrow, elongately turreted, finely vertically striate, sutures impressed, slightly marginate, whorls 7 convex at sides, aperture pyriform, peristome internally slightly labiate, columella arched and truncate.

Distribution : INDIA : Madhya Pradesh, Andhra Pradesh, Keral and Tamilnadu.

Glessula mullorum (Blanford)

1861. *Achatina mullorum* Blanford, *J. Asiat. Soc. Beng.*, 30 : 362, pl. 1, fig. 16.

1914. *Glessula mullorum* : Gude, *Fauna British India*, Mollusca, 2 : 431.

Materials examined : 4 exs., Tilwaraghat, 14.07.1966, Coll. H.P. Agrawal.

Diagnosis : Shell oblong turreted, rather solid, subdistantly striate, spire conical, apex obtuse, suture impressed, whorls 6, convex, body whorl rounded; aperture semicircular, vertical, margins joined by callus, columella arcuate and truncated base, peristome obtuse.

Distribution : INDIA : Madhya Pradesh, Kerala and Tamilnadu.

Genus *Opeas* Albers

1850. *Opeas* Albers, *Die Heliceen.*, p. 175.

2004. *Opeas* : Mitra, Dey and Ramakrishna, *Pictorial Handbook on Indian Land Snails*, p. 161.

Shell small, elongate turreted, imperforate or narrowly perforate, whorl rather flatly convex, smooth or microscopically striate, suture moderately deep. Aperture ovate, peristome thin, columella usually concave and rounded below, not sinuate, margin slightly reflected.

Oviparous in nature and produces small spherical eggs.

Opeas gracile (Hutton)

1834. No. 5, *Bulimus?* (mihi) *gracile* Hutton, *J. Asiat. Soc. Beng.*, **3** : 93.

2004. *Opeas gracile* : Mitra, Dey and Ramakrishna, *Pictorial Handbook on Indian Land Snails*, p. 162, figs. 119, 120.

Materials examined : 2 exs., Sita Pahari, 25.09.1966, Coll. H.P. Agrawal.

Diagnosis : Shell thin, transparent, elongate, with a gradually tapering spire, feebly striate imperforate or very narrowly perforate, whorls 10-12, rounded, aperture semi ovate, columella vertical, slightly reflected, outer lip almost straight, slightly edged.

Distribution : INDIA : Madhya Pradesh and Andhra Pradesh.

Genus *Zootecus* Westerland

1867. *Zootecus* Westerland, *Fauna Paerct Binnen Cochyl.*, **3** : 75.

2004. *Zootecus* : Mitra, Dey and Ramakrishna, *Pictorial Handbook on Indian Land Snails*, p. 164.

Shell rather small, pale or white, perforate, pyriform, cylindrical with conic summit or cylindrical tapering, 7-10 compactly coiled whorls, the last rounded below. Protoconch striate, not bulbous. Axis slender and straight, narrowly perforated throughout. Aperture small, widely ovate, the peristome thickened, blunt, columellar margin straight or concave, with reflexed edge, continuous with the basal lip.

Zootecus insularis (Ehrenberg)

1831. *Zootecus insularis* Ehrenberg, *Symb. Phys. Anim. Evert.*, (1) : Moll.

2004. *Zootecus insularis* : Mitra, Dey and Ramakrishna, *Pictorial Handbook on Indian Land Snails*, p. 165, fig. 125.

Materials examined : 3 exs., Rani Durgavati Samadhi, 25.09.1966, Coll. H.P. Agrawal.

Diagnosis : Shell subcylindrical, perforate, whitish with decussating sculpture, whorls 7, sutures impressed, aperture vertical ovate, apex rather obtuse, lip of the aperture thickened and reflected. Viviparous in nature, dentition achatinoid.

Distribution : INDIA : Madhya Pradesh, Andhra Pradesh, Bihar, Delhi, Gujarat, Jammu & Kashmir, Maharashtra, Punjab, Rajasthan, Uttar Pradesh. *Elsewhere* : Myanmar, Pakistan, Red sea and Srilanka.

Genus *Subulina* Beck

1837. *Subulina* Beck, *Index Moll.*, p. 36.

2004. *Subulina* : Mitra, Dey and Ramakrishna, *Pictorial Handbook on Indian Land Snails*, p. 152.

Shell turreted, imperforate, narrow, thin, brownish or rather translucent, apex obtuse, whorls rounded, smooth or plicate at the sutural regions. Aperture oblique, ovate, columella concave, truncate below.

Subulina octona (Bruguiere)

1798. *Bulimus octonus* Bruguiere, *Encyl. Metn. Vers.*, 1 : 325.

2004. *Subulina octona* : Mitra, Dey and Ramakrishna, *Pictorial Handbook on Indian Land Snails*, p. 152, fig. 104.

Materials examined : 1 ex., Pachpedi, 25.09.1966, Coll. H. Khajuria.

Diagnosis : Shell thin, translucent, yellowish, turreted, gradually tapering to an obtuse apex, striate throughout, strongly on lower whorls 8-9, rounded, sutures deep and crenulate, last whorl rounded. Aperture suboblique, ovate, columellae arched and obliquely truncate at the base, peristome thin.

Distribution : INDIA : Madhya Pradesh, Andhra Pradesh, Andaman & Nicobar islands, Maharashtra, Tamilnadu. *Elsewhere* : Widely distributed through Europe, West Indies, West Africa, North and South America, Srilanka and other islands like Mauritius, Seychelles, New Caledonia etc.

Family 11. VERONICELLIDAE

Genus *Filicaulis* Simroth

1913. *Filicaulis* Simroth, *Reise in Ostafrika v.a. Voeltzkaw Stuttgart*, p. 202.

Body elongate, oval when contracted, linear when extended. A deep furrow present around the margin separating the mantle from the foot. Head retractile under the mantle, two pairs of tentacles, upper pair longer and cylindrical, the lower shorter. Foot when retracted does not extend over the anus, anal opening slit like, not covered by any flap.

Hermaphrodite, both self and cross fertilization takes place.

Subgenus *Eletherocaulis* Simroth, 1913

1913. *Filicaulis* Simroth, *Reise in Ostafrika v.a. Voeltzkaw Stuttgart*, p. 202.

Filicaulis (Eletherocaulis) alte (Ferussac)

1821. *Vaginalis alte* Ferussac, *Table syst. Linnaeus.*, p. 14.

1979. *Laevicaulis alte* : Bishop, *Mem. Qd. Mus.*, **18**(1) : 5.

1991. *Laevicaulis alte* : Subba Rao and Mitra, *Rec. zool. Surv. India, Occ. Pap.*, **126** : 36.

2002. *Filicaulis (Eletherocaulis) alte*, Mitra and Dey, *State Fauna Series : Molluscs of Andhra Pradesh Part-I (Land and Freshwater)*, p. 53.

Materials examined : 1 ex., Jabalpur, a garden in Napier Town, 17.08.1960, Coll. R.C. Sharma.

Diagnosis : Animal lacking a shell, elongate and linear when extended, mantle pigmented with dark brown color, usually with a yellowish band down the middle, foot narrow and transversely grooved.

Distribution : INDIA : Madhya Pradesh, Andaman & Nicobar Islands, Andhra Pradesh, Bihar, Gujarat, Maharashtra, Pondicherry, Punjab, Rajasthan, Tamilnadu, Uttar Pradesh and West Bengal. *Elsewhere* : East Africa, Mauritius, Reunion Island, Malagasy, Hong Kong, China, Formosa, Indonesia, New Caledonia, Loyalti Island, Malay Peninsula & Archipelago and Australia.

GENERAL DISCUSSION & SUMMARY

Regarding the faunal resources of mollusca in Jabalpur consolidated list of freshwater and land molluscs includes five families of freshwater gastropods and 2 families of freshwater bivalves are recorded. In addition, 4 families of land molluscs had also been found.

A total of 27 different species of which 18 freshwater and 9 land forms. Among the freshwater forms 13 species were studied and five recorded from literature. Out of these 13 species, 7 species are gastropods and six species are bivalves. Among the land forms 8 species were studied and one is recorded from literature. Agrawal (1977) recorded 4 species of *Corbicula*, out of those only one species i.e. *Corbicula striatella* is valid now. The existence of other 3 species is doubtful. Two species of *Glessula* viz. *Glessula pauprecula* & *Glessula mullorum* are now for the first time recorded from here mentioned as endemic to Western Ghats and Peninsular India by Ramakrishna and Mitra (2002). So, this work is not enough, further faunal explorations are necessary to find out the real picture.

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