



Rec. zool. Surv. India : 108(Part-2) : 1-15, 2008

LAND AND FRESHWATER MOLLUSCS OF PONDICHERRY

K. V. SURYA RAO, S. C. MITRA AND R. N. MANNA

Zoological Survey of India, M-Block, New Alipore, Kolkata-700 053

INTRODUCTION

The state of Pondicherry, having an area of 492 sq. km., is spread in four parts *viz.*, Pondicherry, Karaikal, Mahe and Yanam. The former two are situated on the coast of Bay of Bengal, south of Chennai (Madras) between Tranquebar and Nagapattinam (in the districts of South Arcot and Tanjavur) in the state of Tamil Nadu. Mahe is situated on the west coast of India between Tellicherry and Badagara in the state of Kerala; whereas 'Yanam', a land locked area is situated south of Kakinada in east Godavari district in the state of Andhra Pradesh. Before merger into Indian Republic, these were under French territory.

Our knowledge on the molluscan fauna of Pondicherry state is based on the earlier works by Blanford and Godwin-Austen (1908), Gude (1914, 1921), Preston (1915) in 'Fauna of British India, Mollusca series and also by Satyamurti (1960). Though marine molluscs of Pondicherry are well known, our knowledge on land and freshwater molluscs are very limited. The present studies were carried on the basis of recent collections made by Southern Regional Station, Zoological Survey of India, Chennai and also the literature records.

There are three species of molluscs described from the state of Pondicherry, of which two are freshwater, *viz.*, *Paludomus acutus* Reeve, 1852 (= *P. tanschauricus* Gmelin) and *Corbicula striatella* Deshayes 1854 and the other a land slug, *Laevicaulis alte* Ferussac 1821, which is the earliest known mollusc from Pondicherry.

A total of 20 species under 15 genera and 13 families of land and freshwater molluscs are recorded from Pondicherry. Freshwater molluscs are represented by 13 species under 10 genera and 8 families; whereas land molluscs are of 7 species under 5 genera and 5 families.

Area-wise, the state of Pondicherry is one of the smallest states in India, hence the number of species recorded is also very small while compared to other states. Forest cover, plays an essential

role in distribution of land molluscs. Since forest coverage is less in the state of Pondicherry that could be a reason for less number of species occurring there.

Class GASTROPODA

Order MESOGASTROPODA

1. Family ASSIMINEIDAE

*1. *Omphalotropis aurantiaca* (Deshayes)

2. Family PILIDAE

2. *Pila virens* (Lamarck)

3. Family VIVIPARIDAE

3. *Bellamya dissimilis* (Mueller)

4. Family BITHYNIIDAE

4. *Gabbia stenothyroides* (Dohrn)

5. *Mysorella costigera* (Kuester)

5. Family THIARIDAE

6. *Paludomus (P.) tanschauricus* (Gmelin)

7. *Thiara (T.) scabra* (Mueller)

8. *Thiara (Melanoides) tuberculata* (Mueller)

Order BASOMMATOPHORA

6. Family PLANORBIDAE

9. *Indoplanorbis exustus* (Deshayes)

Order STYLOMMATOPHORA

7. Family SUCCINEIDAE

*10. *Succinea rugosa* Pfeiffer

*11. *Succinea collina* Hanley and Theobald

8. Family ARIOPHANTIDAE

12. *Cryptozona belangeri* (Deshayes)

13. *Cryptozona bistrialis* (Beck)

9. Family CAMAENIDAE

*14. *Planispira sordida* (Pfeiffer)

Order SOLEOLIFERA

10. Family VERONICELLIDAE

*15. *Laevicaulis alte* (Ferussac)

Class BIVALVIA

Order UNIONOIDA

11. Family AMBLEMIDAE

16. *Parreysia (P.) favidens* (Benson)

17. *Parreysia (Radiatula) caerulea* (Lea)

12. Family UNIONIDAE

18. *Lamellidens consobrinus* (Lea)

19. *L. corrianus* (Lea)

Order VENEROIDA

13. CORBICULIDAE

20. *Corbicula striatella* Deshayes

A. Freshwater :

Key to the families

1. Shell with a single valve 2
 - Shell with two valves 6
2. Shell with an operculum 3
 - Shell without operculum PLANORBIDAE
3. Operculum with concentric growth lines 4
 - Operculum with spiral growth lines 5
4. Shell globose with ovate aperture, operculum calcareous PILIDAE
 - Shell pyramidal with subcircular aperture, operculum horny VIVIPARIDAE
5. Shell big, above 10 mm. in length, turreted or globose, animal with brood-pouch THIARIDAE
 - Shell small, below 10 mm. in length, ovate, animal without brood-pouch BITHYNIIDAE
6. Shell smaller, triangular, with concentric ribs CORBICULIDAE
 - Shell larger, elongate-elliptical, without concentric ribs 7
7. All four gills marsupial, beak sculpture radial and well developed AMBLEMIDAE
 - Only two outer gills marsupial, beak sculpture concentric and rudimentary UNIONIDAE

*Species listed from literature only.

SYSTEMATIC ACCOUNT

Class GASTROPODA

Order MESOGASTROPODA

Family VIVIPARIDAE

Genus *Bellamyia* Jousseume, 1886

Shell oblong, sometimes keeled or angulate at the periphery, with more or less convex whorls; aperture sub-circular, peristome and columellar margin thin and simple. Adult shell without ridges or strong sculptures.

Ethiopean and Oriental.

Represented by a single species.

Bellamyia dissimilis (Mueller)

1774. *Nerita dissimilis* Mueller, *Hist. Verm. Test.*, pt. 2 : 184.

1989. *Bellamyia dissimilis* : Subba Rao in *Handbook : Freshwater Mollusca India* : 48, figs. 64-67.

Material examined : (i) 15 exs., Veerampatnam, Pondicherry, 8.3.91, coll. K.V. Lakshminarayan; (ii) 1 ex., Sumnambukalava village near Pondicherry town, 14.2.58; (iii) 19 exs., Madukarai, 21 kms. S-W. of Pondicherry, 13.3.58, coll. A.G.K. Menon; (iv) 2 exs., Canal adjoining Aragalas river, 1.6 km. from Madadi, Karaikkal, 5.2.57; (v) 25 exs., canal, bank of a paddy field, 7 km. W. of Madadi, Karaikkal; (vi) 10 exs., Tirumallar village, 7 km. W. of Karaikkal, 7.2.57, coll. Pondicherry-Karaikkal Survey, 1956-57.

Measurements (in mm) :

Length	Diameter	Height of the aperture
15.0-24.80	11.0-16.60	8.45-12.60

Distribution : INDIA : Common throughout including Pondicherry.

Elsewhere : Bangladesh, Malaysia, Myanmar, Pakistan and Sri Lanka.

Remarks : Shell conically ovate, suture deeply impressed, whorls scarcely convex, body whorl obsoletely angulate, often with a pale spiral band. Lip of aperture black. Status of the species *B. heliciformes* (Frauenfeld), reported by Preston (1915) from Pondicherry is doubtful.

Family PILIDAE

Genus *Pila* (Bolten) Roeding, 1798

Shell variable, large to very large, globose, perforate, bodywhorl inflated, surface smooth, aperture large, peristome a little thickened, operculum calcareous with a lateral nucleus.

Asia and Africa.

Pila virens (Lamarck)

1822. *Ampullaria virens* Lamarck, *Hist. nat. Anim. sans. Vert.*, 6(2) : 179.

1989. *Pila virens* : Subba Rao in *Handbook : Freshwater Mollusca India* : 60, fig. 87.

Material examined : (i) 5 exs., Botanical Garden at Pondicherry, 29.11.94, coll. Dr. Mary Bai; (ii) 2 exs., Sumnambukalava village, near Pondicherry town, 14.2.58, coll. A.G.K. Menon; (iii) 1 ex., Tiruvattangadu village, 19.5 km. N. of Madadi, Karaikkal, 6.2.57; (iv) 4 exs., Canal adjoining Aragalas river 1.6 km. off Madadi, Karaikkal, 5.2.57; (v) 4 exs., Canal at bank of a paddy field, 7 km. W. of Madadi, Karaikkal, 11.2.57; (vi) 2 exs., Backwater near Casurina plants, 3 km. from Pondicherry, 3.11.57; (vii) 6 exs., Tirumallar village, 7 km. W. of Karaikkal, 7.2.57, coll. Pondicherry-Karaikkal Survey, 1956-57.

Measurements (in mm) :

Length	Diameter	Height of the aperture
20.8–40.50	17.45–30.30	17.70–31.0

Distribution : INDIA : South India and Maharashtra.

Remarks : Shell of this species is variable in its shape of the spire and colour. It is distinguished from the other common species *P. globosa* in being less inflated and having a narrow aperture. The whorls are rather horizontally flattened above at the sutures.

Family BITHYNIIDAE

Key to the genera

1. Shell smooth, columellar fold ridge-like *Gabbia*
- Shell with spiral sculpture, columellar fold not ridge-like *Mysorella*

Genus *Mysorella* Godwin-Austen, 1919

Shell small, depressedly conical, perforate, body whorl large and rounded, with distinct spiral sculpture, aperture oblique, subcircular, columella a little thickened; operculum calcareous, subcircular, externally concave, internally convex, smooth.

Southern India, Sri Lanka.

Mysorella costigera (Kuester)

1852. *Paludina costigera* Kuester, In Martini & Chemnitz, *Syst. Conch. Cab.*, 1(21) : 33, pl. 7, figs. 18, 19.

1989. *Mysorella costigera* : Subba Rao in *Handbook : Freshwater Mollusca India* : 84, fig. 124.

Material examined : 3 exs., Rayapalayam, Karaikkal, 5.3.91, coll. K.V. Lakshminarayana.

Measurements (in mm) :

Length	Diameter	Height of the aperture
3.85–4.50	5.45–6.30	3.0–3.10

Distribution : INDIA : Pondicherry, Karnataka, Tamil Nadu.

Elsewhere : Sri Lanka.

Remarks : Shell globosely conical, perforate, with strong spiral ridges five of which are more strong with a few finer ones in between.

This species does not occur in Bengal. Its Type locality : “Bengal” reported by Preston (1915) and later by Subba Rao (1989) is also misleading.

Genus *Gabbia* Tryon, 1865

Shell small, globose, imperforate or subperforate, generally smooth, whorls rounded, body whorl large, aperture small, rather ovate, columellar fold ridge-like; operculum calcareous.

India, Australia, Africa.

Gabbia stenothyroides (Dohrn)

1857. *Bithynia stenothyroides* Dohrn, *Proc. zool. Soc. Lond.*, : 857.

1989. *Gabbia stenothyroides* : Subba Rao in *Handbook : Freshwater Mollusca India* : 77, figs. 143, 144.

Material examined : (i) 3 exs., Rayapalam, Karaikkal, 5.3.91, coll. K.V. Lakshminarayan; (ii) 71 exs., Usteri Tank, 7 kms. S.W. of Pondicherry, 12.2.58; (iii) 4 exs., Sumnambukhalava village, near Pondicherry town, 14.2.58, coll. A.G.K. Menon.

Measurements (in mm) :

Length	Diameter	Height of the aperture
4.45–5.80	4.40–5.0	3.30–3.70

Distribution : INDIA : Pondicherry, Karaikkal, Tamil Nadu, Maharashtra.

Elsewhere : Sri Lanka.

Remarks : Shell ovately globose, whorls 4–5, rounded, sutures fairly deep, body whorl proportionately large, inflated, spire short.

This species is for the first time recorded from Pondicherry.

Family THIARIDAE

Represented by three species under 2 sub-families, Thiarinae and Paludominae.

Key to the genera

- Shell rounded or ovately conical, usually smooth, whorls 5–6..... *Paludomus*
- Shell elongate, variously sculptured, whorls 8–12 *Thiara*

Subfamily THIARINAE

Genus *Thiara* Roeding, 1798

Shell elongate, moderately large being 3–6 cms. in length, conspicuously sculptured with spiral striae or nodules, sometimes with spines, aperture ovate, vertical, simple, without sinus or canals; operculum pear-shaped with a basal nucleus.

Tropical and subtropical Africa and Asia extending as far north as Formosa and the Ryu Kyu Islands and south upto Northern Australia, Malay Archipelago, Philippines and also various Pacific Islands; abundant in India.

Key to the species

- Shell with spines, height of body whorl almost equal to spire, whorls angular *T. scabra*
 – Shell with tubercles, height of body whorl less than spire, whorls rounded *T. tuberculata*

Thiara (Thiara) scabra (Mueller)

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

1989. *Thiara (Thiara) scabra* : Subba Rao in *Handbook : Freshwater Mollusca India* : 96, figs. 185, 186, 189.

Material examined : (i) 1 ex., Rayapalayam, Karaikkal, 5.3.91, coll. K.V. Lakshminarayan; (ii) 4 exs., Sumnambukhalava village, near Pondicherry Town, 14.2.58, coll. A.G.K. Menon.

Measurements (in mm) :

Length	Diameter	Height of the aperture
10.0–17.95	4.0–6.50	4.15–6.85

Distribution : INDIA : Common throughout including Pondicherry, except Kashmir.

Elsewhere : Coasts of Indo-Pacific, from Zanzibar to New Hebrides, north to the Philippines, also various Pacific islands.

Remarks : Shell elongate, turreted with rough spiral striae and rows of spines directed outward, whorls regularly increasing in size and shouldered above, rounded below; sutures deep, aperture ovate; operculum pear-shaped. It is a variable species.

Thiara (Melanoides) tuberculata (Mueller)

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

1989. *Thiara (Melanoides) tuberculata* : Subba Rao in *Handbook : Freshwater Mollusca India* : 103, figs. 183, 184.

Material examined : (i) 49 exs., Rayapalayam, Karaikkal, 5.3.91, coll. K.V. Lakshminarayan; (ii) 12 exs., Sumnambukhalava village near Pondicherry town, 14.2.58, coll. A.G.K. Menon.

Measurements (in mm) :

Length	Diameter	Height of the aperture
12.40–20.50	4.0–6.15	3.90–6.60

Distribution : INDIA : Very common throughout including Pondicherry, except Kashmir.

Elsewhere : North and South Africa, Eastern Mediterranean countries, South-east Asia, Southern China, Malaysia, Malaya Archipelago, North Australia, various Pacific islands and north to the Ryu Kyu islands of Japan, also New Hebrides.

Remarks : The shell is rather variable. Elongate-turreted, whorls 10–12, well rounded with dark brownish dots and streaks, irregularly distributed. Vertical ribs crossed by spiral striae, more pronounced on upper whorls.

Growth-rates and fecundity of the species under laboratory conditions were studied by Subba Rao and Mitra (1982).

This species is for the first time recorded from Pondicherry.

Subfamily PALUDOMINAE

Genus *Paludomus* Swainson, 1840

Shell very thick, oblong globose, usually smooth or faintly striate, rarely with strong sculpture, body whorl large and inflated, aperture larger than the spire which is short, columella well thickened.

India (South, Southwest and Northeast), Myanmar, Sri Lanka.

Paludomus (Paludomus) tanschauricus (Gmelin)

1791. *Helix tanschauricus* Gmelin, *Syst. Nat. ed.*, **13** : 3655 (Refers to Chemnitz's *Syst. Conch. Cab.*, **9** : 174, figs. 1246, 1247).

1852. *Paludomus acutus* Reeve, *Proc. zool. Soc. Lond.*, : 127 (Type-locality : Near Pondicherry).

1989. *Paludomus (Paludomus) tanschauricus* : Subba Rao in *Handbook : Freshwater Mollusca India* : 118, figs. 221, 252, 253.

Material examined : (i) 1 ex., Thirumallar, Karaikkal, 5.3.91, coll. K.V. Lakshminarayana; (ii) 6 exs., Canal, bank of a paddy field, 3½ miles W. of Madadi, Karaikkal, 11.2.57, coll. Pondicherry-Karaikkal Survey, 1956-57.

Measurements (in mm) :

Length	Diameter	Height of the aperture
18.60	12.45	12.30

Distribution : INDIA : Pondicherry, Andhra Pradesh, Kerala, Maharashtra, Tamil Nadu.

Remarks : Shell conical, whorls 6–8, well rounded, upper whorls with keeled spiral ridges, yellowish brown with dark brown spots, aperture ovate, operculum with a sub-median nucleus.

P. acutus (Reeve), described from ‘near Pondicherry’ has been synonymised with this species.

Order BASOMMATOPHORA

Family PLANORBIDAE

Genus *Indoplanorbis* Annandale and Prashad, 1921

Shell moderately large, thick, discoidal (apex and whorl on same plane) sutures deeply impressed; aperture ear-shaped.

South-east Asia.

Indoplanorbis exustus (Deshayes)

1834. *Planorbis exustus* Deshayes, in *Belanger, Voy. Indes-Orientales*, p. 417, pl. 1, figs. 11-13.

1989. *Indoplanorbis exustus* : Subba Rao in *Handbook : Freshwater Mollusca India* : 142, figs. 326, 327.

Material examined : (i) 5 exs., Madukkarai, 21 miles SW. of Pondicherry, 13.2.58; (ii) 3 exs., Sumnambukhalava village, near Pondicherry Town, 14.2.58, coll. A.G.K. Menon; (iii) 2 exs., on way to Vallukuppam village, one mile N. of Pondicherry, 29.12.56; (iv) 2 exs., canal at bank of Paddy field, 3½ miles W. of Madadi, Karaikkal, 11.2.57; (v) 1 ex., Tiruvattaryadu village, 9 miles N. of Madadi, Karaikkal, 6.2.57, coll. Pondicherry-Karaikkal Survey, 1956-57.

Measurements (in mm) :

Length	Diameter	Height of the aperture
4.45–4.70	6.75–10.75	4.0–4.15

Distribution : INDIA : Common throughout including Pondicherry.

Elsewhere : Indonesia, Myanmar, Malayasia, Pakistan, Sri Lanka, Thailand, Vietnam.

Remarks : Since the genus *Indoplanorbis* is monotypic the general characters of the species are same as given for the genus. The shell is quite variable. Annandale and Prashad (1921) discussed the impact of ecological variations on the species.

Class BIVALVIA

Order UNIONOIDA

Family AMBLEMIDAE

Genus *Parreysis* Conrad, 1853

Shell more or less strong, inflated, rounded to subrhomboidal, distinctly sculptured with zig zag markings, cardinal teeth well developed, lamellar teeth short.

South-east Asia and Africa.

Key to the species

- Shell thicker, more or less elongate, centre of ventral margin swollen, beak strongly sculptured *P. favidens*
 – Shell comparatively thin, more elongate, ventral margin straight, beak weakly sculptured
 *P. caerulea*

Parreysia (Parreysia) favidens (Benson)

1862. *Unio favidens* Benson, *Ann. Mag. nat. Hist.*, (3)10 : 188.

1989. *Parreysia (Parreysia) favidens* : Subba Rao in *Handbook : Freshwater Mollusca India* : 180, figs. 406, 407, 484, 485.

Material examined : (i) 2 exs., Water canals adjoining banks of a paddy field, 5 kms. west of Modapi, Karaikal, 11.2.57, coll. Pondicherry-Karaikkal Survey, 1956-57.

Measurements (in mm) :

Length	Diameter	Height of the aperture
31.4	21.7	14.35

Distribution : INDIA : Common throughout including Pondicherry.

Elsewhere : Bangladesh.

Remarks : Shell thick, oval, inequilateral, tumid, posteriorly angulate with strong sculpture on beak. Cardinal teeth strong and broad.

This species is for the first time recorded from Pondicherry.

Subgenus *Radiatula* Simpson, 1900

Parreysia (Radiatula) caerulea (Lea)

1831. *Unio caeruleus* Lea, *Trans. Amer. Phil. Soc.*, 4 : 95, pl. 13, fig. 25.

1989. *Parreysia (Radiatula) caerulea* : Subba Rao in *Handbook : Freshwater Mollusca India* : 188, figs. 516, 517.

Material examined : (i) 1 ex., 1 valve, water canal, adjoining banks of a paddy field, 5 kms. west of Modapi, Karaikal, 11.2.57, coll. Pondicherry-Karaikkal Survey, 1956-57.

Measurements (in mm) :

Length	Diameter	Height of the aperture
41.0	21.3	13.2

Distribution : INDIA : Common throughout including Pondicherry.

Elsewhere : Myanmar.

Remarks : Shell variable, elongate, posterior end angulate, dorsal margin rather straight, umbo prominent, in adult shell sculpture restricted to umbonal region, posterior umbonal carina distinct.

Family UNIONIDAE

Genus *Lamellidens* Simpson, 1900

Shell elongately elliptical, smooth without strong sculpture, anterior end narrow, posterior broad, often with a posterior ridge, umbo prominently swollen and with curved radiating ridges, periostracum shining, brown to dark brown, left valve with two elongated cardinals and two laterals, right with two lamellar cardinals and one lateral.

India, Bangladesh and Myanmar.

Key to the species

- Shell broad, dorsal margin obliquely truncate at posterior end.....*L. consobrinus*
- Shell narrow, dorsal margin almost straight, gradually sloping at posterior end
.....*L. corrianus*

***Lamellidens consobrinus* (Lea)**

1859. *Unio consobrinus* Lea, *Proc. Acad. Nat. Sci. Philad.*, 3 : 331.

1989. *Lamellidens consobrinus* : Subba Rao in *Handbook : Freshwater Mollusca India* : 164, figs. 384, 385.

Material examined : (i) 1 ex., (young) water canal, adjoining banks of a paddy field, 5 kms. west of Modapi, Karaikkal, 11.2.57, coll. Pondicherry-Karaikkal Survey, 1956-57.

Measurements (in mm) :

Length	Diameter	Height of the aperture
43.5	23.3	13.6

Distribution : INDIA : Pondicherry, Tamil Nadu.

Elsewhere : Sri Lanka.

Remarks : Shell rhomboidal, thick and broad, unbones prominent, dorsal margin obliquely truncate at posterior end which is obtusely angled, anterior end rounded, biangulate posterior ridge well developed, left valve with two ragged cardinals.

This species is for the first time recorded from Pondicherry.

***Lamellidens corrianus* (Lea)**

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

1989. *Lamellidens corrianus* : Subba Rao in *Handbook : Freshwater Mollusca India* : 165, figs. 386, 387.

Material examined : (i) 1 ex., Tirumallar village, 5–6 km. from Karaikkal, 7.2.57; (ii) 5 exs., Water canal, adjoining banks of a paddy field, 5 kms. west of Modapi, Karaikkal, 11.2.57, coll. Pondicherry-Karaikkal Survey, 1956-57.

Measurements (in mm) :

Length	Diameter	Height of the aperture
60.0–73.9	31.8–40	19.5–23.7

Distribution : INDIA : Common throughout, including Pondicherry.

Elsewhere : Bangladesh and Myanmar.

Remarks : Shell narrower, blackish, umbones inflated, dorsal margin straight and long sloping down at posterior end, posterior ridge not distinct, two cardinals in each valve.

This species is for the first time recorded from Pondicherry.

Order VENEROIDA

Family CORBICULIDAE

Genus *Corbicula* Magerle von Muehlfeld, 1811

Shell subtrigonal, thick, strongly sculptured with concentric ribs, ventral margin rounded, umbones well developed, ligament external, three cardinal teeth in each valve, lateral teeth elongate, lamelliform and finely serrated, right valve with two laterals on each side, left with one on each side.

Corbicula striatella Deshayes

1854. *Corbicula striatella* Deshayes, *Proc. zool. Soc. Lond.*, **22** : 344.

1989. *Corbicula striatella* : Subba Rao in *Handbook : Freshwater Mollusca India* : 204, figs. 575-576.

Material examined : 4 exs., and 9 valves, Sumnambukalava village near Pondicherry Town, 14.258, coll. A.G.K. Menon.

Measurements (in mm) :

Length	Diameter	Height of the aperture
12.10–20.80	9.80–18.50	5.70–11.40

Distribution : INDIA : Common throughout including Pondicherry.

Elsewhere : Myanmar, Pakistan, Sindh.

Remarks : Shell thick, moderately large, triangularly rounded, tumid with regular, coarse, concentric ridges, dorsal margin bluntly pointed, umbones prominent, almost central, ligament external and strongly developed, ventral margin rounded, yellowish to dark brown.

Type locality of this species is Pondicherry.

B. Land :

Though the land molluscs are represented by 6 species under 5 families in the list, only two species under Ariophantidae, the largest family of Indian land pulmonates, are studied here.

Class GASTROPODA

Order STYLOMMATOPHORA

Family ARIOPHANTIDAE

Genus *Cryptozona* Moerch, 1872

Shell dextral, perforate, globosely depressed, body whorl inflated, whorls rounded, obliquely striate, sometimes with coloured bands, aperture oblique, peristome simple.

India, Sri Lanka, Thailand.

Although both these species were included under the genus *Ariophanta* by Blanford and Godwin-Austen (1908), following Thiele (1931), these dextral species are treated here under the genus *Cryptozona*. Incidentally, Blanford and Godwin-Austen (1908) also recognised the system of including only the sinistral species under *Ariophanta* in ‘Synopsis of genera’ of the family (p. 26).

Key to the species

- Shell more depressed, with two rufous spiral bands *C. bistrialis*
- Shell more globose, without rufous spiral bands *C. belangeri*

***Cryptozona belangeri* (Deshayes)**

1834. *Helix belangeri* Deshayes, in *Belanger, Voy. zool.*, : 43, pl. 1, figs. 1-3.

1908. *Ariophanta belangeri* : Blanford & Godwin-Austen, *Fauna Brit. India*, Mollusca, Testacellidae and Zonitidae, : 36.

Material examined : (i) 9 exs., from the bank of a tank, 8 kms. from Pondicherry, 26.11.56; (ii) 4 exs., on way to Vaithikuppam village one mile N. of Pondicherry, 24.12.56, coll. Pondicherry-Karaikkal Survey, 1956-57.

Measurements (in mm) :

Length	Diameter	Height of the aperture
8.25–26.0	13.30–33.15	8.40–20.55

Distribution : INDIA : Southern part of the Peninsular India including Pondicherry.

Elsewhere : Maldives.

Remarks : Shell large, globose, perforate, obliquely striate, obsoletely decussate with spiral lines, body whorl large, faintly subangulate at the periphery; spire low, aperture lunate, peristome thin and simple, columellar margin slightly reflected.

***Cryptozona bistrialis* (Beck)**

1837. *Nanina bistrialis* Beck, *Ind. Mol.*, 1 : 2.

1876. *Helix bistrialis* : Hanley and Theobald, *Conch. Indica*, pl. 29, fig. 1.

1908. *Ariophanta bistrialis* : Blanford and Godwin-Austen, *Fauna Brit. India*, Mollusca, : 39, text-fig. 22.

1979. *Cryptozona (Xestina) bistrialis* : Subba Rao and Mitra, *Rec. zool. Surv. India*, 75 : 14.

Material examined : (i) 7 exs., Chinnakalpet, Pondicherry Town, 10.3.91, coll. K.V. Lakhshminarayan; (ii) 1 ex., Sumnambukhalava village near Pondicherry Town, 14.2.58, coll. A.G.K. Menon; (iii) 7 exs., from bank of a tank, 8 kms. from Pondicherry, 26.12.56; (iv) 4 exs., Tiruvatangadu village, 9 miles north of Madadi Karaikkal 6.2.57; (v) 1 ex., Tirumallar village, 3½ miles west of Karaikkal, 7.2.57, coll. Pondicherry-Karaikkal Survey, 1956-57.

Measurements (in mm) :

Length	Diameter	Height of the aperture
9.56–16.25	16.20–25.50	9.90–13.30

Distribution : INDIA : Pondicherry, Andhra Pradesh, Karnataka, Maharashtra, Tamil Nadu.

Remarks : Shell more depressed than in preceding species, thin and fragile, perforate, brownish white, decussately sculptured above, body whorl convex and rather inflated, encircled by two reddish brown spiral bands, spire low; aperture large, broadly lunate, columellar margin a little reflected.

This species is for the first time recorded from Pondicherry.

SUMMARY AND DISCUSSION

Based on the present studies a total of 20 species under 15 genera and 13 families of both land and freshwater molluscs are recorded from the state of Pondicherry. Out of these, 13 species are from freshwater and only 7 species are from land. Six species viz., *Gabbia stanothyroides*, *Thiara tuberculata*, *Parraysia favidens*, *Lamillidens consobrinus*, *L. Corrianus* and *Cryptozona bistrialis* are reported for the first time from Pondicherry. The last mentioned species is a land mollusc. The material available for studies are from Pondicherry and Karaikal only. No material was available for the study from other parts of the state, 'Mahe' on west coast and 'Yanam' near Kakinada on the east coast.

Freshwater gastropods such as *Mysorella costigera*, *Gabbia stenothyroides* and *Paludomus tanschausicus* are restricted to Peninsular India. Rest of the species have all India range of distribution.

Pondicherry forms a part of Peninsular India which constitutes a very distinct zoo-geographical region in India. Referred as 'India Vera' (Mani, 1974) this region contains some of the relics of the Gondwana fauna. Approximately, over 200 species of land and freshwater molluscs under 70 genera are known from the plains of Peninsular India. But the number of species recorded from Pondicherry is too small and may not represent the actual figure of species occurring in that area.

ACKNOWLEDGEMENTS

The authors are grateful to the Director, Zoological Survey of India for the facilities provided to undertake the present work. They also wish to convey their thanks to the officer-in-Charge, Southern Regional Station, Chennai for the collections available for our study. Finally they are thankful to Shri P.K. Bala, for typing the manuscript.

REFERENCES

- Blanford, W.T. and Godwin-Austen, H.H. 1908. *Fauna British India*, Mollusca. (Testacellidae & Zonitidae) : 1-311, text-figs. 1-90.
- Gude, G.K. 1914. *The Fauna of British India*, Mollusca, 2 (Trochomorphidae-Janellidae), i-xii + 1-504, text figs. 1-164.
- Gude, G.K. 1921. *The Fauna of British India*, Mollusca, 3, Land operculates, pp. 1-370, text-figs. 1-42.
- Mani, M.S. 1974. *Biogeography of India* (ed. Mani, M.S.). *Monographiae biologicae*. The Hague : W. Junk : 614-663.
- Preston, H.B. 1915. *Fauna British India*, Mollusca, (Freshwater Gastropoda and Pelycypoda) : 1-244, text-figs. 1-29.
- Satyamurti, S.T. 1960. The land and freshwater mollusca in the collections of the Madras Govt. Museum. *Bull. Madras Govt. Mus. n.s. (nat. Hist.)*, 6(4) : 1-174, 21 pls.
- Subba Rao, N.V. 1989. *Handbook on Freshwater molluscs of India and adjacent countries*, : 1 : 289, figs. 1-600.
- Subba Rao, N.V. and Mitra, S.C. 1982. Bioecology of two melaniid snails (Mollusca : Gastropoda) in ponds near Calcutta, *J. zool. Soc. India*, 34(1 & 2) : 21-32.
- Thiele, J. 1931. *Handbuch der systematischen Weichtierkunde*, Vol. I, Gustav Fischer, Jena, 376 pp.