

## Freshwater Gastropod of Khuzestan Province, South-West Iran

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### Abstract

Many freshwater gastropodes are involved in the life cycle of parasitic flukes. Some of these are important in public heath and veterinary medicine. A comprehensive snail search was undertaken throughout provinces in Iran. In the first step, freshwater bodies of Khuzestan, were searched for potential intermediate host snails. Fifteen taxa, namely 8 prosobranch snails and 7 pulmonate snails were collected during the 1990s. *Neritina mesopotamica* Martens 1879 was found to be new species for Khuzestan.

**Key words:** *fresh water, gastropod, mollusk, snail, Iran.*

### Introduction

Some freshwater snails act as intermediate hosts of digenetic trematodes of medical or veterinary importance. For example *Bulinus truncatus* and *Lymnaeid* snails transmit human Biharziasis and Fascioliasis, respectively (Andrews, 1999; Annonymous, 1979; Graczyk and Fried, 1999; Hubendick, 1951; Malek, 1980, and Sun, 1999). However, no complete snail survey of Iran has been done (Solem, 1979). Therefore, a comprehensive snail search was undertaken supported financially by Tehran University of Medical Sciences, School of Public Health and Institute of Public Health Research, Tehran, Iran, and technically in part, by the Danish

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Bilharziasis Laboratory, World Health Organization, collaborative centre for snail identification, Copenhagen, Denmark.

### **Material and Method**

Freshwater bodies of Khuzestan province, south-west of Iran, including ponds, springs, marshy areas, swamps, drains, channels, banks of rivers, were searched mostly by a wire- meshed dip- net and also by feeling with the hands on rocks within algae and mosses for tiny snails in seepage water and caves( Mansoorian, 1989). Shells were put into plastic jars and labelled, living animals were first killed in boiling water, then transferred into 70% ethanol. Labelling included name of collector, name of locality and date of collecting. Identification of taxa was based on morphology of shells and soft parts, according to the Danish Bilharziasis Laboratory ( Kristensen, 1984 ) .

Followings indicate the positions of the species found and their descriptions :

### **Systematic list of freshwater snails of Khuzestan , south-west Iran.**

Phylum Mollusca

Class Gastropoda

Subclass Prosobranchiata

Order Mesogastropoda

Family Neritidae

-*Neritina mesopotamica* Martens, 1870

- *Theodoxus euphraticus* (Mousson ,1874)

Family Thiaridae

- *Melanoides tuberculata* Annandale ,1919

- *Melanopsis costata* Brot, 1879

- *M. doriae* Issel 1865

- *M. nodosa* Mousson ,1874

- *M. praemorsa* ( Linnaeus ,1758 )

Family Viviparidae

-*Bellamya bengalensis* ( Lamarck, 1822)

Subclass Pulmonata

Order Basommatophora

Family Lymnaeidae

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- *Lymnaea auricularia* Linnaeus ,1785
- *L. a. gedrosiana* Annandale and Prashad ,1919
- *L. stagnalis* (Linnaeus, 1774)
- *L. truncatula* (Müller, 1774)

Family Physidae

- *Physa acuta* Draparnaud 1801

Family Planorbidae

- *Bulinus truncatus* ( Audouin ,1827)
- *Gyraulus euphraticus*( Mousson, 1874)
- *Planorbis intermixtus* ( Linnaeus, 1758)

## PROSOBRANCHIATA

*Bellamya bengalensis* (Lamarck, 1822).

17.8 × 27.8mm. Medium sized to large dextral and conical shell with ovate ,corneous, nucleated operculum.

Adult female animal with brood pouch containing offspring snails, male with one tentacle longer than other.

Adult snails have 5 whorls and small umbilicus. There is a moderate keel on about the middle of the body whorl which is more prominent in younger animals. Found living to the north of Ahwaz ( Mansoorian , 1994).

*Melanoides tuberculata* Annandale & Prashad, 1919.

13.5 × 46.5 mm. Shell dextral with ovate , horny and paucispiral operculum. Fully grown shells consist up to 14 whorls. Spirl ridge present on body whorl.

This mollusc fairly widespread in south-west of Iran ( Annandale & Prashad, 1919).

*Melanopsis costata* Brot, 1879 .

7.8 ×17.2 mm. Shell dextral, medium sized; with sharp apex and transverse ribs on whorls. Notch present at columellar margin. Found to the north of Ahwaz (Prashad, 1921).

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*M. doriae* Annandale 1918.

8.3 × 17.6 mm. Shell dextral, medium sized, smooth, brownish and banded. Fully grown shells comprise 7-8 flat whorls with sharp apex. Notch present at columellar margin. This taxon present all over the region ( Mansoorian, 1994).

*M. nodosa* Mousson 1847.

7.6 × 16.8 mm. Shell similar to preceding species, but with sculptures and nodules on shell surface. Found only in Khuzestan, Iran (Mansoorian, 1994).

*M. praemorsa* (Linnaeus 1758).

11.4 × 18.7mm. Most characters of the shell similar to the preceding species, but apex eroded and shells vary in colors with smooth surface. The taxon have limited distribution in the area (Brown, 1994).

*Neritina mesopotamica* Martens 1879( figs. 1-4) .

9.8 × 12.5 x 15.4 mm. Shell strong, hemispherical, patterned with a short or almost concealed spire, operculum almost ovate, calcareous paucispiral with internal apophyses, namely, the rib and peg. Radula rhipidoglossate. The shell has irregular white spots on the surface and is serrated on the parietal wall. Found in the Khorramshahr, Arvand Rood, Khuzestan, south-west Iran ( Prashad, 1921; Mansoorian 1994).

*Theodoxus euphraticus* ( Mousson 1874).

4.6 × 5 x5.8 mm. Shell dextral, small, hemispherical with a short or concealed spire and highly variable in color . Operculum calcareous, ovate, paucispiral with rib and peg ( Prashad ,1921; Roth, 1987).

## PULMONATA

*Lymnaea auricularia* (Linnaeus 1758) .

14.4 × 18.2 mm. Shell medium sized with short spire , sharp apex, large body whorl, and ear-shaped aperture. All *Lymnaeid* snails have triangular tentacles and a monocuspид central tooth in the radula (Hubendick, 1951).

L. a. gedrosiana Annandale & Prashad 1919

8 x 13.4mm. The adult shells resemble in part to *Lauricularia* but have larger spire, thinner body whorl and less ear - shaped aperture. The gastropod have country-wide distribution (Hubendick, 1951; Mansoorian, 1994).

L. truncatula (Müller 1774) .

4.5 × 9 mm. Shells dextral, small, with deep sutures, a blunt apex and 5-6 convex whorls. Adult shells rarely reach 10 mm high, with fold on the columella and a narrow umbilicus .Found throughout Iran (Hubendick ,1951).

L. stagnalis (Linnaeus, 1758).

20 × 54mm. Shell dextral, large, with slender spire, sharp apex and imperforate bulgy body whorl. Fully grown shell with 7-8 whorls and ear-shaped aperture. Found in Hosseinyeh swampy area, in the north; in Horol-azin huge swampy and frontier water body in the southernmost of Khuseztan (Hubendick, 1951; Mansoorian, 1998).

Bulinus truncatus ( Audouin, 1827) .

9.4 × 14.8 mm. Adult shells conical , sinistral, rarely reaching 15 mm high. No fold on columella. Neither renal nor rectal ridge; but haemoglobin present. Transverse rows of radula slightly curved. Central tooth of radula bicuspid; mesocone of laterals arrowshaped. Intermediate host for human Schistosomiasis in Khuzestan , Iran (Mandahl-Barth, 1958; Mansoorian, 1994).

Gyraulus euphraticus (Mousson ,1874).

1.5 ×7 mm . Shell small, discoid, almost flat with 3.5 - 4.5 whorls. A narrow and lateral keel present and last whorl slightly reflected. Shell surface smooth and no sculpture visible. Mantle pigmented against kidney lacking ridge. Male genitalia mounted in glicerin reveals stylet on tip of verge (Annandale, 1920).

Planorbis intermixtus (Linnaeus, 1758)

2.6 ×12.8mm. Diameter and height of the shell rarely reach 20mm & 3mm, respectively. Adult shells have 5-6 flat whorls, sometimes with a lateral carination.

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*Physa acuta* Draparnud, 1805.

9 × 15mm. Shell medium sized, sinistral, glossy with a sharp apex. Neither haemoglobin nor pseudobranch present. Transverse rows of radula V-shaped; central tooth multicuspid. Shell easily confused with *B. truncatus* both being sinistral (Brown, 1994).

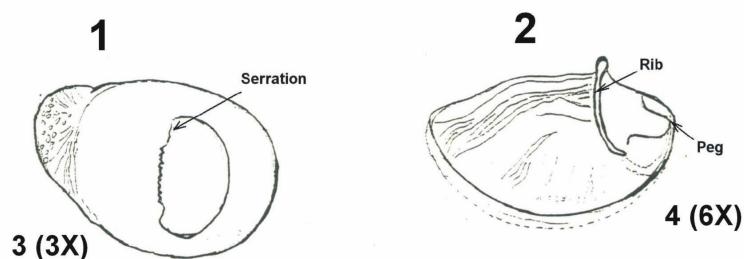
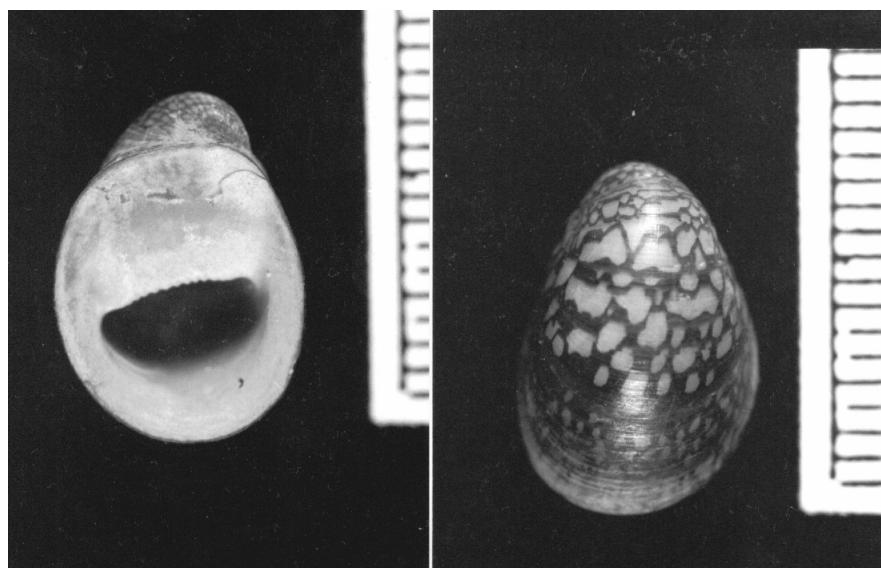
### Results and Discussion

The late Georg Mandahl-Barth (Unpublished data, 1958), Danish Bilharziasis Laboratory, Charlottenland, Copenhagen, Denmark, a World Health Organisation (WHO) centre for snail identification, in a communication with Institute of Public Health Research, Tehran University of Medical Sciences, Iran (formerly Institute of Malariology and Parasitology, affiliated to University of Tehran, Iran), identified 10 freshwater snails for Khuzestan in samples which were sent to him for identification. He reported the following taxa: *Bellamya bengalensis*; *Bulinus truncatus*; *Lymnaea auricularia*; *L. a. gedrosiana*; *L. truncatula*; *Melanoides tuberculata*; 3 species of *Melanopsis*; and a few offspring snails of *Bithynia* species. I have never encountered *Bithynia*, but I collected 6 more taxa, including *Gyraulus euphraticus*; *Lymnaea stagnalis*; *Melanopsis doriae*; *Neritina mesopotamica*; and *Planorbis intermixtus*. Massoud & Hedayeti-Far (1979), recorded 3 species other than Mandahl-Barth's but *L. stagnalis*; *Neritina mesopotamica* (figs 1- 4) and they did not give localities. Mandahl-Barth also released a provisional key for freshwater snails of Iran, but did not report any *Lymnaea stagnalis* for Iran and Khuzestan; instead he contributed *Neritina schlaeflii* from Ghaes island, an offshore territory, which belongs to United Arab Emirates (UAE), for the time - being.

### Conclusions

Seven pulmonate snails, namely *Bulinus truncatus*; *Gyraulus euphraticus*; *Lymnaea auricularia*; *L. a. gedrosiana* and *L. truncatula*; *Physa acuta*; *Planorbis intermixtus*; 8 operculate mollusks, viz. *Bellamya bengalensis*; *Melanoides tuberculata*; *Melanopsis costata*; *M. doriae*; *M. nodosa*; *M. praemorsa* and *Theodoxus euphraticus* were reported for Khuzestan province. *Neritina mesopotamica* was found to

be a new species for Khuzestan, and Iran. Two taxa of Bivalvia, i.e. Corbicula spp and Unio spp were also collected during this snail survey and further investigations are underway in this regard.



**Figures**

1-3: *Neritina mesopotamica*, aperture view

2: *Neritina mesopotamica*, dorsal view

4: Operculum with rib; and peg

1-2: Each scale = 1mm.

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## References

- Andrews, S.J., (1999) *The life cycle of Fasciola hepatica*. Pp.1-31. In: *Fasciolasis*. Edited by John P. Dalton. Dublin city university, Republic of Ireland, CAB International 1999.
- Annandale, N., & Prashad, B., (1919) *The Mollusca of inland water of Baluchestan and of Sistan*. Records of Indian museum.Vol XVIII 1919.
- Anonymous (1979) *Introduction*, Danish Bilharziasis Laboratory, World Health Organisation Centre for Snail Identification.
- Brown D.S., (1994) *Freshwater snails of Africa and their medical importance*, London, Taylor & Francis Ltd. Revised 2nd edition.
- Graczyk, T.K., and Fried, B., (1999) *Development of Fasciola Hepatica in the intermediate host*, Pp. 31- 43. In: *Fasciolasis*. Edited by: John P.Dalton , Dublin city university, Republic of Ireland. CAB International 1999.
- Hubendick, B., (1951) *Recent Lymnaeidae, Their variation, morphology, taxonomy, nomenclature and distribution*. Stockholm, Almquist and wiksells Boktryckeri AB.
- Kristensen, T.K., (1984) *Methodology for snail dissection and preparation*. Danish Bilharziasis Laboratory. Charlottenlund, Denmark.
- Malek, E.A., (1980) *Snail-transmitted Parasitic diseases*, Volume 1& 2, CRC Press.
- Mansoorian, A., (1986) *A practical guide to the identification of the freshwater snails of Iran*, J. Pub.Hlth, 15(1-2), 41-53 (In persian).
- Mansoorian, A., (1998) *Some freshwater snails from Iran*, Unitas Malacologica, 1998 World Congress of Malacology, Washington D.C., USA, 25-30 July 1998.
- Mansoorian, A., (1994) *Freshwater snails of Iran*, Technical series, No 2145, 1374, Scientific publication of School of Public Health & Institute of Public Health Research, P.O.Box 6446,Tehran 14155, Iran.
- Massoud, J. & Hedayeli-Far, M. (1979), *Research note. Freshwater mollusk fauna of the Khuzistan and Khorram-Abad areas in southwestern Iran*. Malacological Review, 12(1,2), p.96.

- Prashad, B., (1921) *Report on the freshwater gastropod molluscs of lower Mesopotamia. Part III. The families Neritidae, Hydrobiidae and Melaniidae*, Records of Indian Museum, XVIII, pp.215-26.
- Roth, G, (1987), *Data on the distribution and faunal history of the genus Theodoxus in the middle east. (Gastropoda: Neritidae)*. Proceedings of the symposium on the fauna and Zoogeography of the middle east, Mainz 1985.
- Solem, A., (1979), *Some mollusks from Afghanistan*, Fieldiana, Zoology, new series, No.1.
- Sun, T., (1999) *Parasitic disorders: pathology, diagnosis, and management*. Second Edition.