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A contribution to the knowledge of some inland water hydrobiid snails in Israel (Gastropoda, Prosobranchia)

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The treatment of several collections of freshwater snails from Israel has resulted in the discovery of a new hydrobiid prosobranch snail in the springs of the former Lake Hula and catchment area of the River Jordan. For anatomical reasons a new genus (*Mienisiella*) is created, so far comprising two species, of which one new (*M. mienisi*). The opportunity is used for a revision of the species of the genus *Semisalsa* in Israel and neighbouring areas. Some details are given about the living hydrobiids in Israel.

Key words: Gastropoda, Prosobranchia, Hydrobiidae, anatomy, Israel, River Jordan, Lake Hula

INTRODUCTION

This essay was composed in cooperation with Dr. Chanan Dimentman and Dr. Heather Bromley, both Department of Zoology, The Hebrew University of Jerusalem, IL-91904 Jerusalem. Most of the revised material was collected by C. Dimentman and collaborators in the nineteen-eighties, but an important part was collected earlier by others, e.g. the Hebrew University of Jerusalem-Expedition to Lake Hula in the nineteen-forties. The revision has resulted in the discovery of a new hydrobiid species belonging to a new genus, which until now comprises only two species. In addition to this, a rearrangement of some longer known hydrobiid species could be made, based on newly collected material suitable for anatomical research. In some cases a comparison with species outside of Israel is made, namely in the genus *Semisalsa*.

THE GENUS SEMISALSA IN ISRAEL

Not long ago Giusti & Pezzoli (1984: 140) argued, that *Semisalsa* Radoman, 1974, is a synonym of *Heleobia* Stimpson, 1865, and they designated all species as *Heleobia*. The anatomical and conchological characters are very similar, and both are indeed closely related, but as long as it is uncertain whether the European species belong to the same genus as the American *Heleobia* species, I regard *Semisalsa* as a valid genus; this is also in the interest of a stable nomenclature.

The collected material shows a difference between the animals from Upper Galilee and from the catchment area of the Dead Sea in Israel and in Jordan. So we know only two living species of *Semisalsa* in Israel: *S. contempta* and *S. galileae*. A third species, *S. longiscata*, [locus typicus Sidon (= Saida in Lebanon)] inhabits the mountains and the coastal area of Lebanon, Syria and Turkey as far north as Antakya, but in the Quaternary it lived in Israel too. In neighbouring areas still further south one finds *S. musaensis* [locus typicus "Ain el-Musa im Wadi Musa bei Tor (= at-Tur)"] at the

Gulf of Suez on the Sinai Peninsula. The taxonomical value of *S. annandalei* (Preston, 1913) and *S. syngenes* (Preston, 1913) could not be assessed because authentic material was not available to me.

Semisalsa galileae (Preston, 1913) (figs. 1, 2)

Bithinella galileae Preston, 1913: 470, pl. 27 fig. 5 (Wad-es-Semakh, Lake of Tiberias, in stream).
Bithinella vexillum Preston, 1913: 470, pl. 27 fig. 4 (Octagonal pool at et-Tabgah [= 'En Nur]).

We had the opportunity to clarify the taxonomical situation concerning the two above mentioned "*Bithinella*"-species of Preston. Firstly, the name *Bithinella* is a nomen nudum as it has never been published. We know *Bittinella* Dall, 1924, a subgenus of *Bittium*, Cerithiinae, and, what Preston probably wished to express, *Bythinella* Moquin-Tandon, 1856, a genus of Hydrobiidae, Hydrobiinae. But the species of *Bythinella* are clearly characterized and differentiated by a blunt, often nearly flat, apex and a characteristic shape of the shell, and also by typical male reproductive organs. The genus *Bythinella* is restricted in present times to Central and South Europe as far as West Anatolia. So the species of Preston are certainly not *Bythinella*-species.

As can be seen from the material collected by Dimentman and Bromley, the shells belong to the genus *Semisalsa* Radoman, 1974. Until now, we know only a few species in the Near East, whose affiliation to this genus is confirmed by dissection: *S. longiscata* (Bourguignat, 1856), *S. contempta* (Dautzenberg, 1894) and *S. palmyrae* (Dautzenberg, 1894) (see Schütt, 1983a: 34).

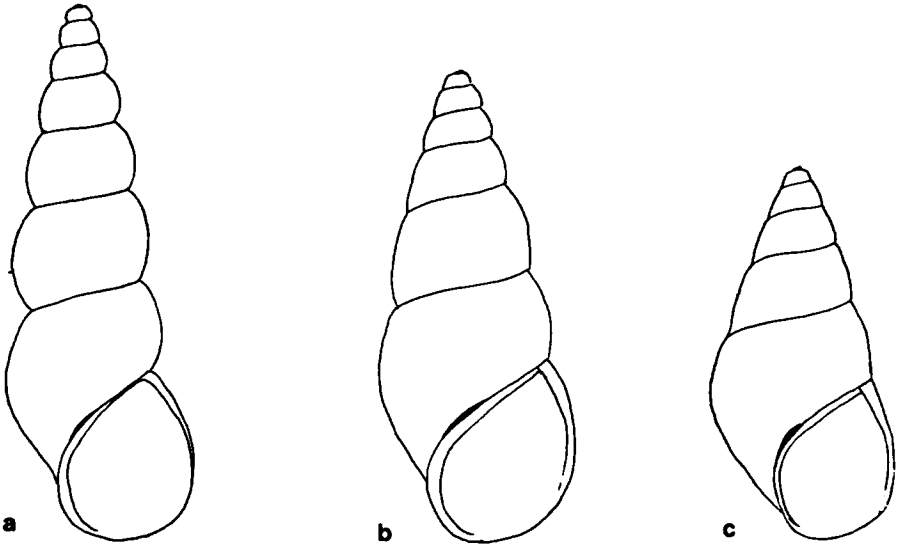

Fig. 1. Shells of *Semisalsa* spec. (a) *S. longiscata* (Bourguignat, 1856), Turkey, Antakya, Karasu canal; (b) *S. galileae* (Preston, 1913), Israel, Bet Zaida, "Huqoq pond"; (c) *S. contempta* (Dautzenberg, 1894), Jordan, Balqa.

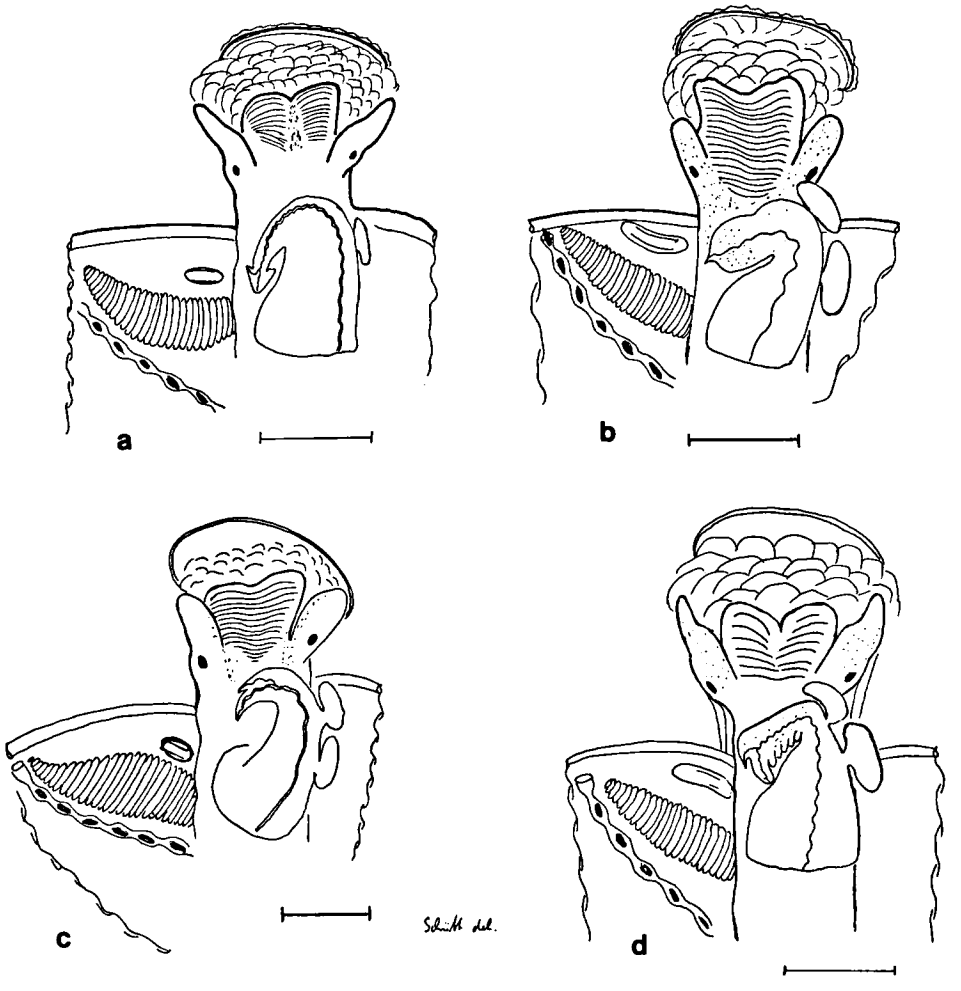

Fig. 2. *Semisalsa galileae* (Preston, 1913). Israel, Kinneret area: (a) Aqueb, 1.5.1985; (b) "Huqoq pond", 31.7.1985; (c) "Huqoq pond", 1.4.1985; (d) Zaki, 30.6.1985. Scale 0.2 mm.

The shells collected by Dimentman, 18.5.1989 in 'En Nur (= Tabgah), Octagonal pool, unfortunately are empty, so that they can be judged only by the shape of the shell. They are distinguished from the shells of *S. contempta* by a higher spire and more rounded whorls and they resemble most the form, which Preston (1913) described as "*Bithinella*" *galileae* from Wad-es-Semakh on Lake Tiberias.

The shells from 'En Nur and from Bet-Zaida Valley mostly resemble *S. galileae*; therefore I identify them as *S. galileae*, for several dissections show clearly the integration with *Semisalsa*. A certain uniformity can be seen among the shells of *Semisalsa* in

the region of the Upper Jordan Valley (Hula basin and the basin of Lake Kinneret), as several samples from different places in that area demonstrate. The shells from the catchment area of the Upper Jordan Valley have a longer spire and more rounded whorls than the shells of *S. contempta*, but not such a long spire and not such rounded whorls as in *S. longiscata*.

Comparison with shells from the other brackish springs of the shores of Lake Kinneret shows that, in spite of the variability of all *Semisalsa* species, they differ from *S. longiscata* on the one hand and from *S. contempta* on the other hand. To show the differences I have made some schematized drawings of shells of the species mentioned here (fig. 1). The illustrations of the pallial organs of *S. galileae* from different places in the Kinneret area demonstrate the affiliation to *Semisalsa* (fig. 2).

S. galileae was found at the following places in Lake Kinneret area (the abbreviations are voucher numbers in the Hebrew University of Jerusalem HUJ collection): Bet Zaida (Buteicha) Valley: Aqeb (S-2, S-5, By 14); "Huqoq Pond" (S-9, S-10, S-11, S-13, S-24, S-27); Majrasse (S-4, Va-3, S-7, S-17); Zaki (S-1, S-6, S-8, S-12, S-12a, S-14, S-15, S-18, S-19, S-20, S-21, S-22, S-23, S-25); 'En Nur (= Tabghah): Octagonal pool. In the Hula Valley: 'En Te'o (= Jahula) and the Upper River Jordan. Nahal Tal. 'En Notera canal.

Semisalsa contempta (Dautzenberg, 1894) (fig. 3)

Bithinella contempta Dautzenberg, 1894: fig. 3 (Nahr el-Haroun, tributary to the Orontes).

As shown in fig. 1 and the explanations under *S. galileae*, *S. contempta* has the shortest spire of the three species mentioned here. It was found in the following brackish and saline waterbodies in the Dead Sea area: Ein Turabe (= 'Enot Samar), 'Enot Zuqim, 'Enot Qane, 'En Hakikar, Berekhot Nawit. Besides the here enumerated places many other localities on the eastern side of the River Jordan in Jordan are known (see Schütt, 1983b: 51). Fig. 3 gives some anatomical details.

OTHER HYDROBIID SNAILS IN ISRAEL

Pseudamnicola solitaria Tchernov, 1971 (fig. 4)

Pseudamnicola solitaria Tchernov, 1971: 202, figs. 2-5 (Wadi Zin: 'En Avedat).

Tchernov mentioned several springs in Israel in the Nahal (Wadi) Zin catchment area and on the west shore of the Dead Sea. I published four sites on the east side of the Dead Sea in Jordan (Schütt, 1983b: 51, 53). Dimentman collected several, but mostly juvenile, shells in 'Enot Samar spring on the west side of the Dead Sea. Fig. 4 gives some anatomical details.

Orientalina gaillardotii (Bourguignat, 1856) (fig. 4)

Bithinia gaillardotii Bourguignat, 1856: 147, pl. 8 figs. 10-11 (environs de Saida).
Bithinia hebraica Bourguignat, 1856: 181, pl. 15 figs. 7-9 (environs de Saida.
Bithinia gaillardoti; Puton, 1856: 12
Pseudamnicola gaillardotii; Schütt, 1983a: 37, pl. 2 fig. 39.

This species was found by Dimentman in the spring of Nahal Tal in the Hula Valley area. It is widespread in Lebanon and is known from Syria too. In Lebanon it lives

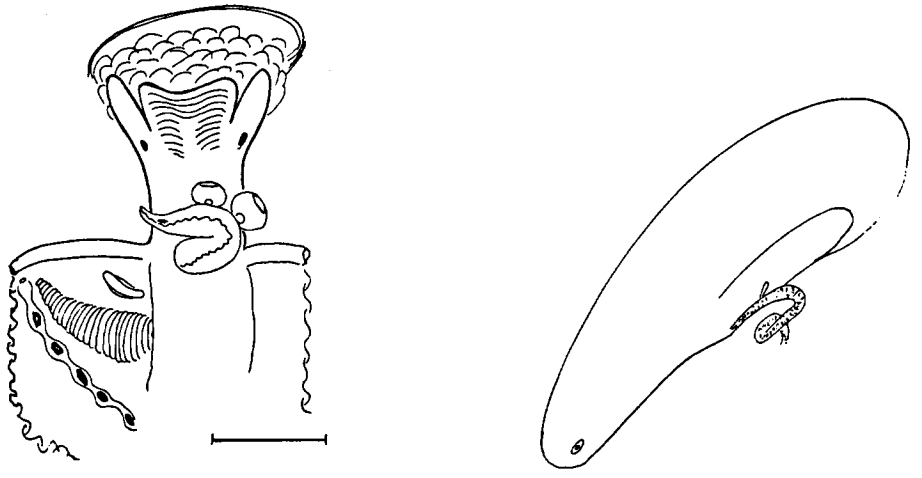

Fig. 3. *Semisalsa contempta* (Dautzenberg, 1894), Ein Turabe (= 'Enot Samar); inner pallial organs and copulatory organ of a male, and female copulatory organ with bursa copulatrix and receptaculum seminis of animals collected by Dimentman, 8.1.1988. Scale 0.2 mm.

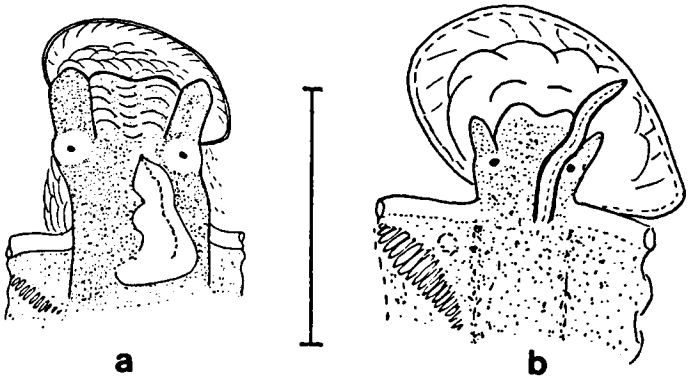

Fig. 4. Inner pallial organs and genital tract of male animals of (a) *Orientalina gaillardotii* (Bourguignat, 1856) from Israel, Nahal Tal, and (b) *Pseudamnicola solitaria* Tchernov, 1971, from Jordan, Wadi Zerqa Main. Scale 1 mm.

in the spring area of the Orontes (Nahr el-Assi) and in other springs at high altitudes. The anatomy of the animals in Nahal Tal is identical to that of the snails from Labwé, a spring of the Orontes (Schütt, 1991, in press). Fig. 4 gives some anatomical details.

The dissection of some very small freshwater snails in Israel resulted in the discovery of a new genus with at least two species:

Mienisiella n. gen.

A genus of Prosobranchia, Hydrobiidae, Hydrobiinae, with extremely small and largely unpigmented animals, possessing transparent, colourless, nearly flat to conical towered shells; the animals are differentiated from similar genera by a male copulatory organ with two excrescences, one greater glandular excrescence on the right side and a small simple excrescence on the left side. It belongs to the group of the genera *Horatia* Bourguignat, 1887, *Hauffenia* Pollonera, 1899, *Neohoratia* Schütt, 1961, *Islamia* Radoman, 1973, *Arganiella* Giusti, 1980, and *Fissuria* Boeters, 1981 (see Bodon & Giusti, 1986: 63). Type-species *Mienisiella mienisi.*

Mienisiella mienisi n. sp. (fig. 5)

Diagnosis. — A species of *Mienisiella* with very small transparent and colourless shells, four rapidly increasing and strongly rounded whorls, and an almost circular aperture.

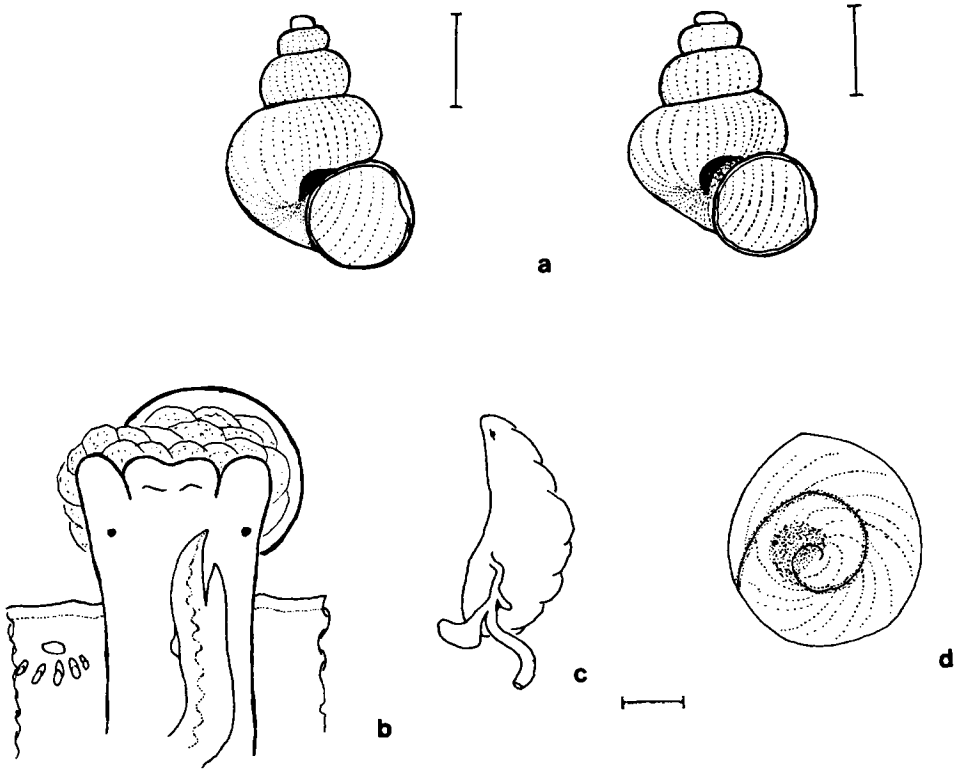

Fig. 5. *Mienisiella mienisi* n. gen., n. sp., paratypes from 'En Te'o (= Jahula); (a) two different shells; (b) animal with inner pallial organs: gill leaflets with osphradium, male copulatory organ; (c) female copulatory organ with bursa copulatrix and receptaculum seminis; (d) operculum. Scale 0.5 mm (a), or 0.1 mm (b-d).

Description. — Shell very small, colourless, transparent with high conical spire; four rapidly increasing and strongly rounded whorls with deep sutures, all whorls but the first with a clear sculpture of growth-lines, which are easily visible through the shell at the inside of the aperture; aperture well rounded, somewhat higher than broad; edge of the aperture sharp, externally drawn somewhat foreward, at the columellar side not or hardly thickened and not reflected; umbilicus broad and relatively deep. Dimensions of the type shell (in mm): heigth 1.4; breadth 1.0; height of the aperture 0.55; width of the aperture 0.5. The soft parts totally colourless, too, except for the eyes, which are small, rounded and black. The operculum is paucispiral, glossy and light yellow, thin membraneous, with a slightly excentric nucleus. Inner pallial organs: gill with 7-9 leaflets, osphradium nearly invisible; male copulatory organ slender with two appendices, the right large and acute, the left small and flat; female copulatory organ with bursa copulatrix and receptaculum seminis.

Material. — All localities are springs in the Hula basin in N. Israel. Locus typicus: 'En Te'o (= Jahula), karstic spring in a cave; another spring: 'En Awwazim, karstic spring in the Hula Valley. Holotype: Senckenberg-Museum, Frankfurt am Main, Germany, SMF 309434 Paratypes: SMF 309435; Hebrew University of Jerusalem, Dept. of Zoology; Nationaal Natuurhistorisch Museum, Leiden; Naturhistorisches Museum, Wien; colln. Schütt, 1380.

Relationships and ecology. — In respect to the anatomical situation and according to the terminology of Giusti, Pezzoli & Bodon (1981), this species is close to *Hauffenia*, but the high conical shell is very unusual for this genus. The animals are not blind, for the only pigmented parts of their body are the small rounded eyes. They are inhabitants of freshwater springs and probably live in the stenothermic parts of the outflow of subterranean waters.

Mienisiella gaillardoti (Germain, 1911) (fig. 6)

Valvata (Cincinna) gaillardoti Germain, 1991: 66 (Environs de Saida).
Valvata (Cincinna) gaillardoti; Germain, 1921: 509, pl. 21 figs. 14-16.
Neoharatia gaillardotii (sic!); Moubayed, 1986: 126, 127.

This very small snail was for a long time only known from its type locality near Sayda in Lebanon. Not long ago Moubayed found this species in two springs of the spring area of the Orontes (Nahr el-Assi) in Lebanon: a karstic fountain in the uppermost part of the River Orontes, 1000 m above sea-level near the village of Labwé, and in a small rheocrene (spring) 20 km downstream from the first locality about 600 m above sea-level at the brooklet of Zarka, 5 km below its spring near Mount Hermel. Dimentman collected *Mienisiella gaillardoti* in the waters and springs of the Hula basin at three localities: (1) 'En Te'o (= Jahula) spring in a cave; (2) Nahal Tal, one of the sources of River Jordan; (3) 'En HaDayag, spring of the former Hula lake. A fourth place is in the Judean mountains: H. Se'adim.

This snail should not be confused with *Orientalina gaillardotii* (Bourguignat, 1856) [*Bithinia*], which, like *Mienisiella gaillardoti* (Germain, 1911), was described from the collections of Dr. Gaillardot; the former is considerably larger and higher than the latter. Likewise, the latter is not to be confused with shells of young animals of *Valvata saulcyi* Bourguignat, 1853, which has indeed a similarly shaped shell, but is nearly three times as large as *M. gaillardoti*. The greatest diameter of *M. gaillardoti* is 1.2 mm, whereas the greatest diameter of *V. saulcyi* is over 3.0 mm.

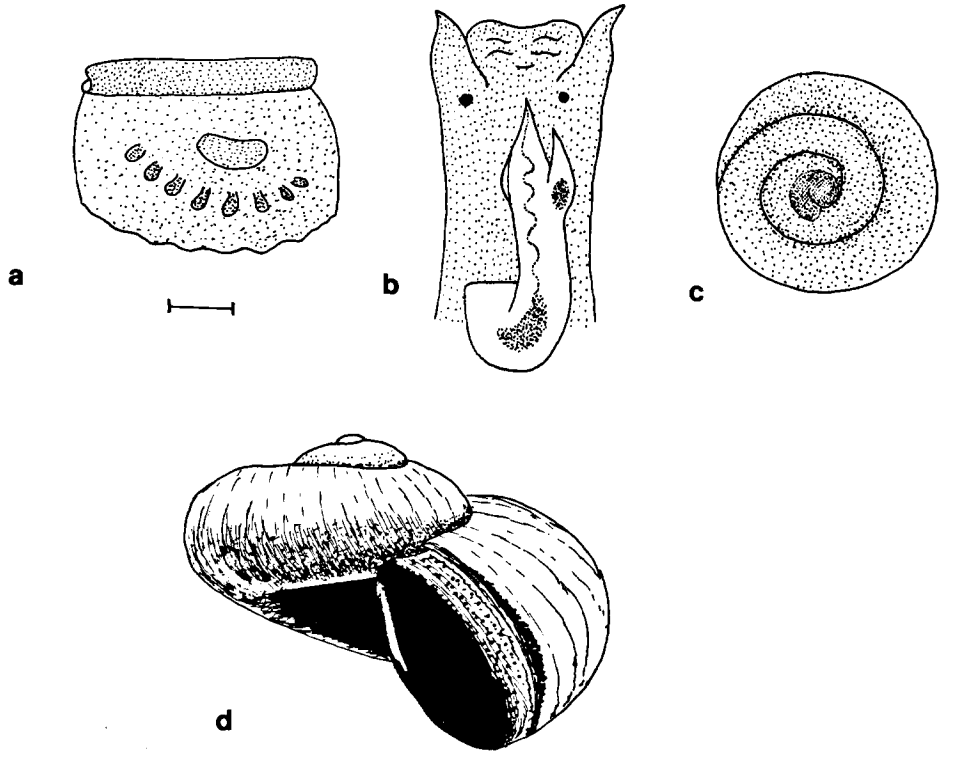

Fig. 6. *Mienisiella gaillardoti* (Germain, 1911) from 'En Te'o (= Jahula), leg. Dimentman, 15.10.1989; (a) inner pallial organs: ctenidium and osphradium; (b) male copulatory organ; (c) operculum; (d) shell. Scale 0.1 mm.

The photograph shown by Germain (1921: pl. 21 figs. 14-16) is somewhat poor; therefore a drawing is given here (fig. 6).

The mantle of the animal of this species is slightly pigmented, but the inner pallial organs are visible through the mantle; the head and the operculum are slightly pigmented, too; the penis is slender with two excrescences, an acute one at the right side and a small flat one at the left side; the glandular excrescence at the right side has a pigmented spot and a second greater spot is on the base of the penis.

The spire of the shells from the Hula basin is somewhat higher than that of those from Sayda and from the Orontes spring area, but this difference is inconsiderable and obviously it is within the variability of this species.

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