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ALIEN PLANORBID (MOLLUSCA, GASTROPODA PULMONATA) FROM SOUTH WEST AFRICA ERRONEOUSLY RECORDED AS *BIOMPHALARIA PFEIFFERI*

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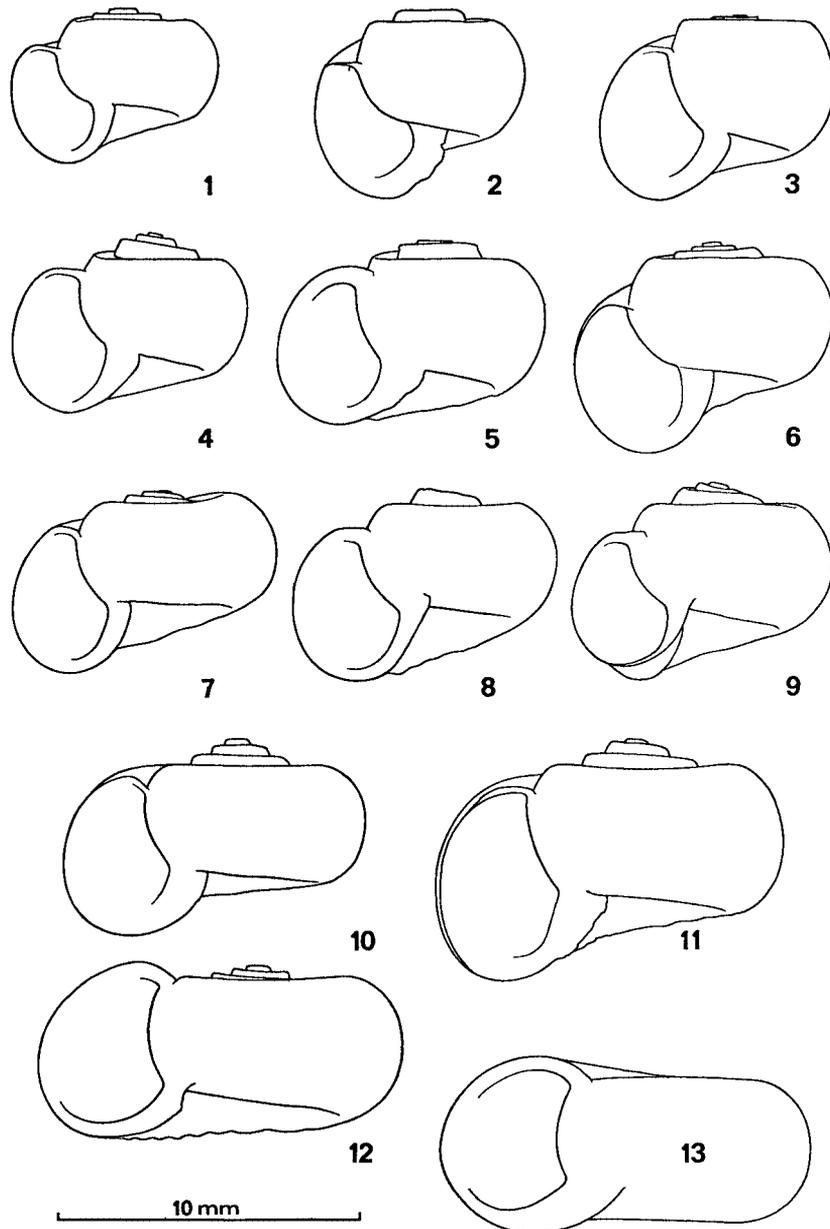
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With 22 text-figures

In 1970 I published a record of the freshwater snail *Biomphalaria pfeifferi* (Krauss, 1848) (fam. Planorbidae) for South West Africa: "Sandamap Farm, Spitzkoppe" (Van Bruggen, 1970: 45, figs. 1-13). Dr. D. S. Brown of the Medical Research Council (London) kindly drew my attention to the fact that judging from the figures the described specimens certainly do not belong to this species. Dr. Brown generously agreed to examine the material, which unfortunately only consisted of shells. His conclusion is that these represent an imported alien species of the American planorbid genus *Helisoma* Swainson, 1840. This genus is rich in species which are very difficult to tell apart, particularly if their genital anatomy and geographical origin are unknown. Tropical aquarium fanciers and fish breeders have spread some freshwater snails outside their countries of origin and thus the genus *Helisoma* is also known from South Africa (Brown, 1967: 483). However, Dr. Brown writes: "Speaking from memory, my *Helisoma* from Natal were different to yours, in that the spire was generally far less elevated. I suppose that there may have been a number of introductions from separate sources."

The following additional data on the above South West African locality have kindly been supplied by the collector, Mr. B. H. Lamoral of the Natal Museum, Pietermaritzburg, South Africa. He writes as follows: "I did however collect some molluscs on Spitzkoppe farm which is adjacent to Sandamap farm. The bulk of the Spitzkoppe farm molluscs we collected at the outer base of the empty water reservoir. This water reservoir was the usual one that



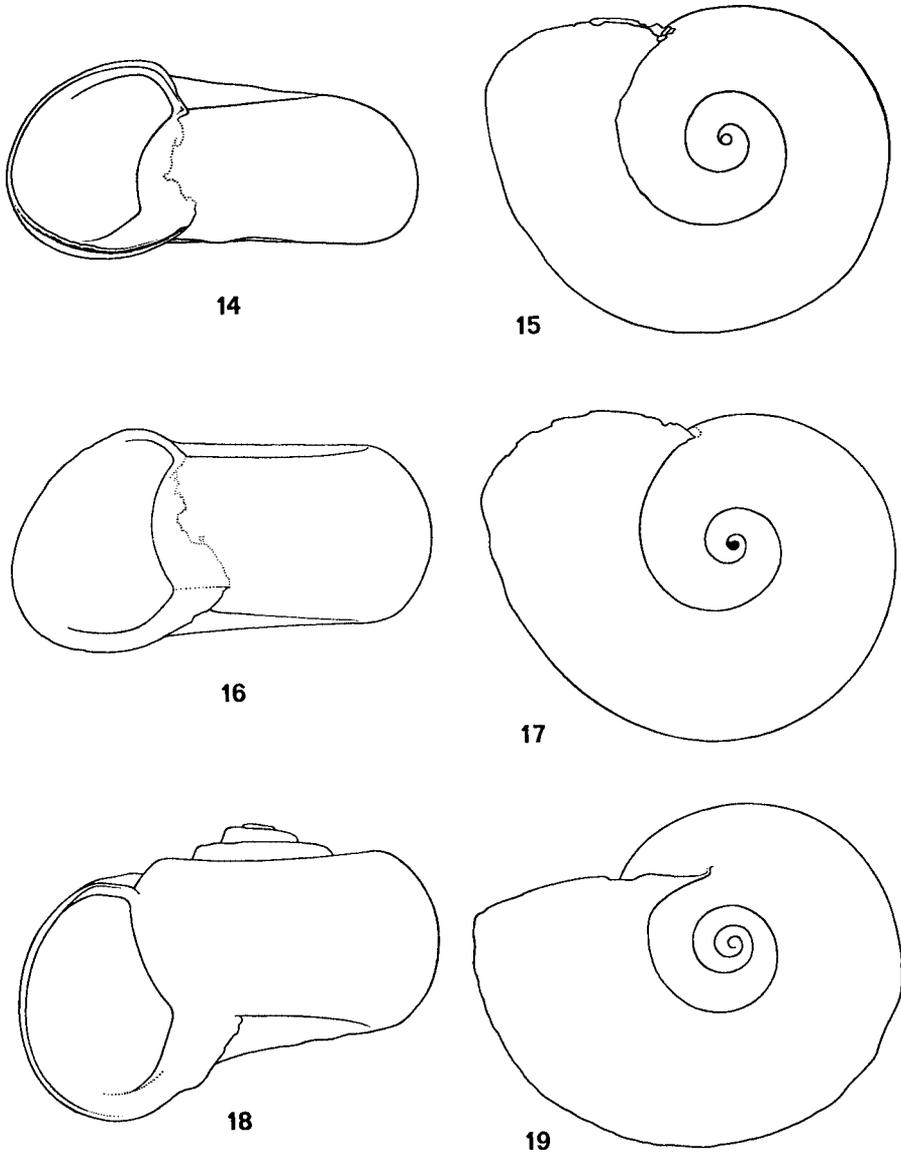
Figs. 1-13. *Helisoma* cf. *duryi seminole* Pils. from South West Africa, Sandamap Farm, Spitzkoppe (after Van Bruggen, 1970, figs. 1-13). For measurements see table 1; the specimen of fig. 11 has been depicted in detail in figs. 18, 19, and 22. Nos. 2, 3, 5-7, 9, 13 in Natal Museum, Pietermaritzburg, nos. 1, 4, 8, 10-12 in Rijksmuseum van Natuurlijke Historie, Leiden.

one sees on farms (round, approximate diameter 4 metres, height 2 metres).” These reservoirs are usually supplied with water from a wind pump. “There were certainly no dams of any kind on either Sandamap or Spitzkoppe farms and therefore no fish. Spitzkoppe farm had been abandoned for 6 months when we got there . . .” The suspicion arises here that either the snails already permanently dwelt in the water reservoir, having arrived there by human agency, or that perhaps an aquarium tank was emptied and rinsed in the reservoir when the farm was being abandoned. The specimens must have lived for some time after that, because the material, although consisting solely of empty shells, is quite fresh and does not show any signs of weathering. There are, however, signs of changing environmental conditions (see below and Van Bruggen, 1970: 45), which may reflect more natural conditions than the fairly stable environment of an indoor aquarium tank. We may entertain the hope that the species has perhaps not yet spread and may have become extinct locally. The material discussed here belongs to the Natal Museum, while duplicates have been deposited in the Rijksmuseum van Natuurlijke Historie, Leiden.

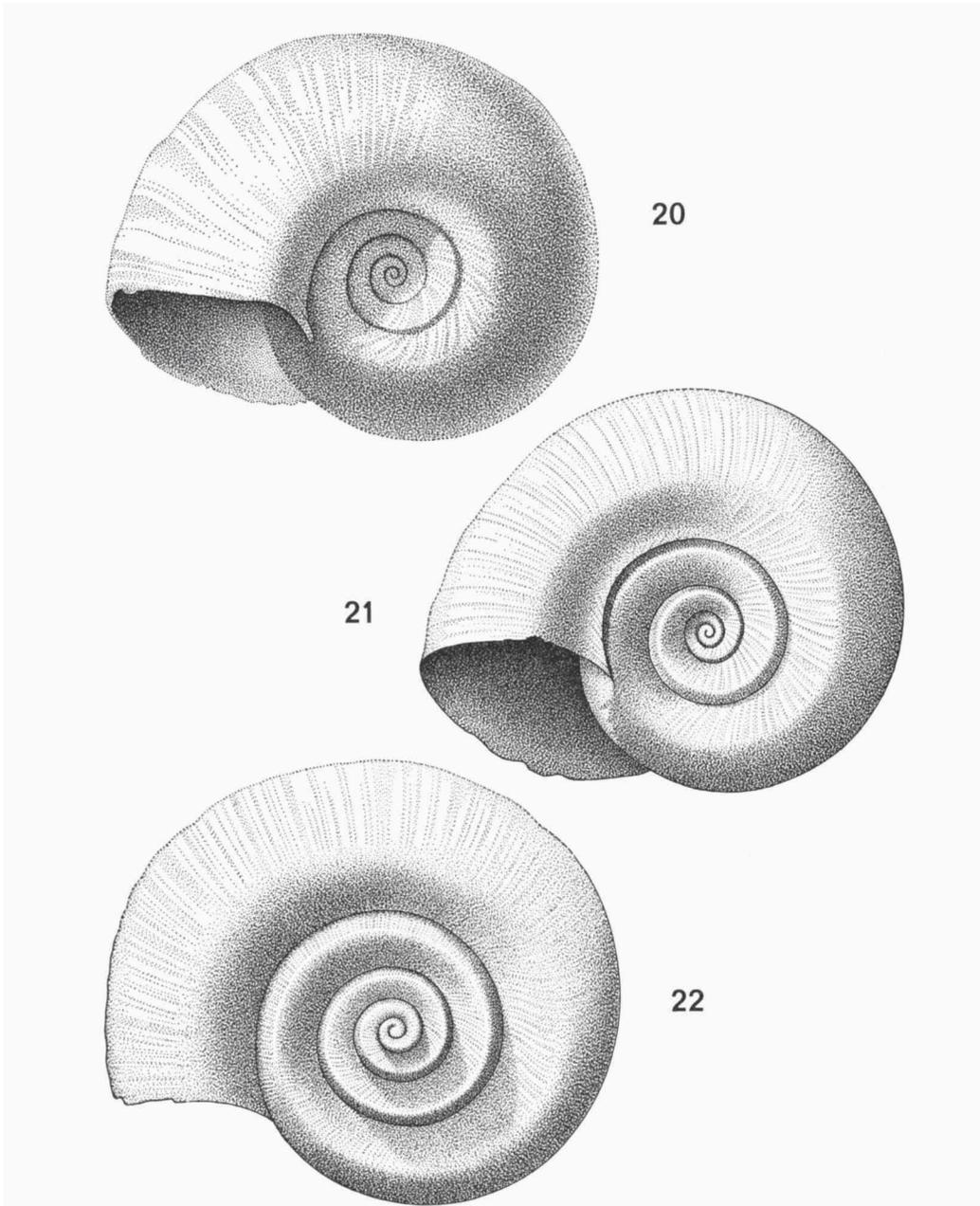
It is perhaps useful to add figures and summary descriptions of the material now available in order to draw attention to the species involved and for comparison with future material. Apart from the South West African specimens, I have at my disposal three shells presented to the Leiden museum by Dr. D. S. Brown. These are labelled as follows: “Zululand, Mandini Paper Mill, north bank Tugela R., 1 mile W of north coast road, leg. D. S. Brown, 12.xi.1964, coll. no. 508. Concrete lined cooling pond with thick algal slime; shells only, together with *Lymnaea columella* and *Biomphalaria pfeifferi*. Pond had been treated with copper sulphate because of snail outbreak 18 months before.” (cf. Brown, 1967: 483). Furthermore another shell of *Helisoma* has been obtained by C. C. Appleton in “dune sand at Cape Point” (Cape Peninsula); this specimen is also in the Leiden museum. Descriptions are based on the fact that planorbids have sinistrally coiled shells.

The Cape Point shell (figs. 14, 15, 20) measures 9.5×18.8 mm and has 5 whorls. Apart from oblique and well-marked growth lines, the somewhat weathered shell shows little sculpture. The spire is shallow and sunken and the whorls are subangular on the upper surface; seen from below the initial whorls are deeply sunken, forming a conspicuous umbilicus. The oblique aperture is angular above and broadly rounded below; the lower point of attachment of the lip to the shell is somewhat to the right of the upper point of attachment.

The three Zululand shells in the Leiden museum measure 7.7×12.9 ($4\frac{1}{4}$



Figs. 14-19. *Helisoma* from Southern African localities, half schematic, all on same scale. 14-15. *Helisoma* spec., Cape Point, C. C. Appleton leg., major diameter 18.8 mm. 16-17. *Helisoma* spec., Zululand, Mandini Paper Mill, D. S. Brown leg., major diameter 16.9 mm. 18-19. *Helisoma* cf. *duryi seminole* Pils., South West Africa, Sandamap Farm, Spitzkoppe, B. H. Lamoral leg., major diameter 11.7 mm (cf. fig. 11). All specimens in Rijksmuseum van Natuurlijke Historie, Leiden. H. Heijn del.



Figs. 20-22. *Helisoma* spec. from Southern African localities, all on same scale. 20. *Helisoma* spec., Cape Point, C. C. Appleton leg., major diameter 18.8 mm. 21. *Helisoma* spec., Zululand, Mandini Paper Mill, D. S. Brown leg., major diameter 16.9 mm. 22. *Helisoma* cf. *duryi seminole* Pils., South West Africa, Sandamap Farm, Spitzkoppe, B. H. Lamoral leg., major diameter 11.7 mm (cf. fig. 11). All specimens in Rijksmuseum van Natuurlijke Historie, Leiden. H. Heijn del.

whorls), 9.1×14.0 ($4\frac{1}{4}$ whorls), and 9.7×16.9 mm (5 whorls, figs. 16, 17, 21) respectively. The shells, particularly the fresh specimen figured here, have a characteristic pale olive colour. Apart from oblique and well-marked growth striae, there are traces of faint spiral sculpture, but this does not result in a reticulate pattern. The spire is shallow and somewhat sunken, the whorls being elevated and markedly angular above. Seen from below the initial and the following whorls are deeply sunken forming a conspicuous, wide and deep umbilicus. The oblique aperture is subangular above and broadly rounded below; the lower point of attachment of the lip to the shell is somewhat to the right of the upper point of attachment.

The Zululand shells are not as flat as the Cape Point specimen; the spire of the latter is much more sunken than in the Zululand shells. The whorls of the Cape Point shell are not elevated and the umbilicus of this specimen is markedly shallower than in the Zululand shells.

The South West African material (figs. 1-13) shows a lot of variation; measurements have been tabulated in table 1. All shells have a pale yellowish-

height x maj. diameter	number of whorls	fig. in 1970 paper	collection
6.1 x 12.4 mm	5	13	NM
6.1 x 12.3 mm	5	12	RMNH
7.5 x 11.7 mm	5	11*	RMNH
6.5 x 10.1 mm	5	10	RMNH
6.7 x 9.2 mm	4 $\frac{1}{2}$	8	RMNH
6.4 x 9.2 mm	4 $\frac{1}{2}$	6	NM
5.5 x 9.1 mm	4 $\frac{1}{2}$	7	NM
6.5 x 9.0 mm	4 $\frac{1}{2}$	5	NM
5.6 x 8.8 mm	4 $\frac{1}{2}$	9	NM
5.6 x 8.3 mm	4 $\frac{1}{2}$	3	NM
6.1 x 8.0 mm	4 $\frac{1}{2}$	4	RMNH
6.1 x 7.6 mm	4 $\frac{1}{2}$	2	NM
5.2 x 7.0 mm	4	1	RMNH

Table 1. Measurements of specimens depicted in figs. 1-13; the specimen of fig. 11 (asterisk) has been figured in detail in figs. 18, 19, and 22. These 13 specimens more or less represent the variation in the sample under discussion. NM = Natal Museum, RMNH = Rijksmuseum van Natuurlijke Historie.

-chestnut brown colour. The growth striae are slightly oblique and well-marked, sometimes even resulting in wrinkles, "probably due to unfavourable conditions, such as periodic droughts, etc. In profile this is shown by corrugations on the base of the shell (see fig. 12)." (Van Bruggen, 1970: 45). There is no trace of spiral sculpture. The spire is not much elevated and rarely even (somewhat) sunken (fig. 13); the whorls are elevated and

markedly angular above. Seen from below all whorls are deeply sunken forming a conspicuous, wide and deep umbilicus. The umbilicus is usually not as wide as, but generally deeper than, that of the Zululand shells. The aperture is hardly oblique, subangular above and broadly rounded below; the lower point of attachment of the lip to the shell is slightly to the right or perpendicularly below the upper point of attachment (figs. 18, 19, 22)).

As regards specific identity alien species are notoriously difficult to name. In the present case the lack of original distribution data is added to the absence of anatomical data; in very many cases anatomical details are required for the identification of planorbid snails. As far as can be judged all material belongs to the genus *Helisoma*. A close scrutiny of figures (Pilsbry, 1934, pl. 7 figs. 5-7, and pl. 10 fig. 4; Baker, 1945, pl. 80 fig. 9, pl. 102 figs. 21-23, pl. 103 figs. 1-19, pl. 112 figs. 1-8) and material (*Helisoma duryi seminole* Pils.: U.S.A., Florida, Lake County, Lake Eustis (type locality), J. B. Clark leg., 1935, 25 shells, gift from Academy of Natural Sciences, Philadelphia, to Rijksmuseum van Natuurlijke Historie) kindly supplied by Dr. R. Robertson and Mrs. M. C. Rulon (Philadelphia), shows that the South West African material is close to *Helisoma (Seminolina) duryi seminole* Pilsbry, 1934, particularly on account of its scalarid tendencies, while at the same time also retaining the typical planorboid type of shell for part of the population. *H. duryi seminole* is endemic to Florida, which also applies to the subgenus *Seminolina* Pilsbry, 1934. Therefore the material recorded s.n. *Biomphalaria pfeifferi* by Van Bruggen (1970: 45) has now been labelled *Helisoma* cf. *duryi seminole* Pils.

The Cape Point shell is difficult to name because it represents a generalized type of shell in the family Planorbidae; it may be compared to species such as *H. (Pierosoma) pilsbryi* Baker, 1926, and *H. (P.) tenue* ("Philippi" Dunker, 1850), although the spiral sculpture typical for the subgenus *Pierosoma* Dall, 1905, is either absent or has worn off.

The Zululand specimens, while being fresher, also represent the above type of shell and by virtue of their size may belong to at least half a dozen species of *Helisoma*. Comparison with material in the Leiden museum and elsewhere and figures in the literature (e.g., Baker, 1945) have not led to a satisfactory identification. It is not likely that the Zululand shells and the Cape Point specimen have the same specific identity as the South West African material; indeed, the Zululand and Cape Point shells may belong to mutually different species.

Alien molluscs in Southern Africa number at least 26 species (vide Van Regteren Altena, 1966; Van Bruggen, 1964, 1966, 1967), to which may be added now at least two species of *Helisoma*, although it is not certain whether

these are still extant. A few of the imported molluscs have managed to survive, spread and proliferate even to the stage of plague proportions. The species which have markedly proliferated are *Lymnaea columella* (Say), a few slugs of the family Limacidae, and the helicids *Cochlicella ventricosa* (Drap.), *Theba pisana* (Müll.), and *Helix aspersa* Müll. For the time being it is unlikely that species of *Helisoma* have to be added to this list of nefarious immigrants.

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