

The Ovulidae: A Key to the Genera, and other Pertinent Notes

(Mollusca : Gastropoda)

BY

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INTRODUCTION

THE PURPOSE OF THIS PAPER is to provide keys to the generic units of the Ovulidae and to summarize the history of the ovulid taxonomy. The first major attempt at a classification was by SCHILDER (1927), who later modified this early scheme (SCHILDER, 1932, 1968, 1971). Further modifications were made by CATE (1973), and the present paper suggests a few other needed changes of taxonomic sequence (see Tables 1 and 2). A few supplemental notes on nomenclature and systematics, with some addenda, are also included.

KEY TO THE GENERA OF THE OVULIDAE

My previous paper (CATE, 1973) was an illustrated review of all the named species of Ovulidae. With this material at hand it is now possible to take a more comprehensive view of the family. Examining the morphology, one can recognize better ways to group the various units into a logical sequence. Especially critical is the need of drawing a dividing line between the two tribes, for there is a clinal or transitional change of shell form between Ovulini and Volvini (Simniini) which Schilder did not clearly define. It is my opinion that the straightening out of the shell aperture and the concomitant elongation of the terminal ends provide a good basis for separation into two tribes: the Ovulini are characterized by ovate to globular shells, whereas in Volvini there is a total, or nearly total, lack of a central broadening of the shell.

The key adopted for the Ovulidae is dichotomous and is based upon successive optional dual alternatives. In order to retrace a chosen alternative, the numbers of pre-

ceding choices have been added in parentheses at the start of each pair of dual options. As an example, option 1 leads to option 2 or option 3, while the number in parentheses adjacent to 2 or 3 shows that these options were arrived at from choice 1 [see KEEN (1963: 1) for an added explanation of this type of key arrangement].

It should be pointed out that the key does not imply any special sequence of the generic arrangement but has been based upon morphological similarities in the species groups. Numbers in brackets following the genus name refer to plate figures in CATE (1973) which best illustrate the morphologic character of that unit.

During the preparation of this paper I have had the gracious assistance of Dr. Myra Keen of Stanford University, especially in the drafting of the key to the genera. I am deeply grateful to Dr. Keen for this and other guidance. I am also indebted to Jean Cate for constructive suggestions, and to all who have written me their criticisms and praise I wish to express my thanks.

Key to the tribes and subfamilies of the Ovulidae

1. Shell cypraeiform, with incised transverse striation over entire surface; both lips of aperture ribbed 2
Shell not cypraeiform, transverse striation, if present, not incised; lips of aperture smooth to dentate but not ribbed 3
2. Transverse striation not secondarily sculptured Eocypraeinae, Eocyprini
Transverse striation pustulose dorsally Jennerini
3. Aperture somewhat curved, shell moderately to markedly inflated Ovulinae
Aperture narrow, nearly straight; shell mostly narrow in outline Volvini

Key to the genera and subgenera of the Ovulidae

1. Shell cypraeiform, both margins of aperture ribbed 2
Shell not cypraeiform; margins of aperture smooth to dentate 3
2. (1) Sculpture of regular incised striae throughout *Pseudocypraea* [1]
Sculpture of dorsum pustulate in adults *Jenneria* [2]
3. (1) Shells relatively large (length over 60 mm) 4
Shells small to medium sized (length under 60 mm) 5
4. (3) Ovate, canals short, twisted, especially adapically; outer lip crenulate *Ovula* [189]
Spindle-shaped, canals long and slender; outer lip smooth *Volva* [245]
5. (3) With broadly truncate terminal ends; shell with medial angulation 6
With ends rounded to pointed, especially adapically; no angulation 10
6. (5) Ends of shell broad; aperture straight, central *Cyphoma* [146]
Ends of shell narrowed, aperture curved 7
7. (6) Terminals short; dorsum with a raised knob near ends *Calpurnus* [135]
Terminals well developed; dorsum smooth to striate 8
8. (7) Outer lip ridged, but not truly dentate *Crenavolva* [101]
Outer lip with projecting teeth, especially adapically 9
9. (8) Angulation with spaced knobs *Rotaovula* [100]
Angulation smooth or evenly striate *Dentiovula* [19]
10. (5) Outline nearly globose 11
Outline ovate to elongate 12
11. (10) Outer lip denticulate; dorsum striate *Galeravolva* [3]
Outer lip smooth to slightly crenulate: dorsum smooth *Globovula* [40]
12. (10) Evenly ovate, *i. e.*, greatest diameter about midway between ends of shell 13
Pyriform (greatest diameter posterior to midline) to elongate 17
13. (12) Outer lip broad; shell weakly striate throughout 14
Outer lip narrow to moderate; striation, if present, mainly at ends 15
14. (13) Aperture curved to left adapically *Procalpurnus* [137]
Aperture curved to right adapically *Neosimnia* [201]
15. (13) With well developed terminal ridge abapically; outer lip with deeply incised teeth *Prionovolva* [14, 16a]
Without (or having a weak) terminal ridge abapically 16
16. (15) Lip teeth weakly developed *Testudovolva* [8]
Lip teeth well developed *Sandalia* [191]
17. (12) Spire area flattened; dorsal striation strong, even *Carpiscula* [133]
Spire not flattened; striations weak or uneven 18
18. (17) Shell pyriform in outline (greatest diameter adapical to midline) 19
Shell elongate 31
19. (18) Color present in bands, or color spots coalesced *Margovula* [27]
Color, if present, not in bands 20
20. (19) Color, if present, in spots *Diminovula* [49]
Color not present or uniformly distributed 21
21. (20) Abapical extremity elongate, recurved *Lacrima* [35]
Abapical extremity not elongate or recurved 22
22. (21) Lip thin, never reflected 23
Lip broad, reflected 24
23. (22) Outer lip edge thin *Xandaravolva* [67]
Outer lip edge corded *Labiovulva* [65]
24. (22) Terminals short, flattened; shell diameter about $\frac{2}{3}$ of length *Inflatovula* [59]
Terminals moderately projecting; diameter less than $\frac{2}{3}$ of length 25
25. (24) Outer lip with sharp denticles 26
Outer lip smooth or weakly dentate 27
26. (25) Terminals spatulate *Serratovolva* [111]
Terminals pointed *Cuspiovolva* [113]
27. (25) Aperture broad, lip thin 28
Aperture narrow, lip moderate to thick 29
28. (27) Dorsum with low angulation *Stohleroma* [97]
Dorsum evenly arcuate *Aperiovula* [71]
29. (27) Terminals projecting, looped *Pseudosimnia* [44]
Terminals roundly blunt 30
30. (24) Terminals relatively wide; dorsum with a low angulation; aperture curved *Adamantia* [90]
Terminals narrow, evenly rounded *Primovula* [80]
31. (18) Adapical terminal squared at end 32
Adapical terminal slot-like, not squared 33
32. (31) Aperture narrow, almost linear throughout *Kuroshiovulva* [200]
Aperture not linear, wider abapically *Hiatavolva* [194]
33. (31) Ends attenuated, adapical end pointed, almost needle-like 34
Ends looped or rounded 38

- 34.(33) Terminals markedly long, tending to be recurved *Calcarovula* [239]
Terminals only moderately long, not recurved 35
- 35.(34) Inner lip longer than outer lip 36
Inner lip not longer than outer lip 37
- 36.(35) Aperture relatively broad throughout
..... *Turbovula* [230]
Aperture narrowed above mid-line
..... *Pellasmnia* [220]
- 37.(35) Terminals long at both ends; outer lip angulate *Phenacovolva* [213]
Terminals only moderately long; outer lip thin, not angulate *Spiculata* [182a]
- 38.(33) Funicular ridge strongly spiral 39
Funicular ridge weak or wanting 41
- 39.(38) Outer lip with a thickened or corded edge
..... *Pseudocyphoma* [156]
Outer lip no more than moderately thickened 40
- 40.(39) Aperture broad for its full length
..... *Simnialena* [165]
Aperture narrowed adapically *Dissona* [186]
- 41.(38) Adapical canal broadly looped; columella with a well developed ridge *Cymbovula* [181]
Adapical canal not broadly looped 42
- 42.(41) Outer lip thin *Simnia* [157]
Outer lip broad to reflected 43
- 43.(42) Outer lip strongly dentate; sculpture granose
..... *Prosimnia* [162]
Outer lip and shell smooth or nearly so 44
- 44.(43) Lanceolate, aperture narrow *Aclyvolva* [173]
Relatively short; aperture moderate to broad 45
- 45.(44) Aperture broad *Subsimnia* [161]
Aperture of medium width *Delonovolva* [124]

History of the Genera of the Ovulidae

With the present expansion of the taxonomic structure of the Ovulidae it appears pertinent at this time to trace the usage of generic names in that group through the years, starting with SCHILDER's (1927) work as the beginning of modern study of the family. Schilder's specialization in the superfamily Cypraeacea, of which the family Ovulidae is an integral part, brought these shells under a more intensive scrutiny, perhaps, than ever before, although the Cypraeidae *sensu stricto* were always his primary interest.

In the past, information about the Ovulidae has been rather obscure for the most part, with almost no radular studies recorded; this has led to much synonymy and to

erratic generic assignments. The number of known species has now grown, however, where the terms "splitting" and "lumping" will no longer explain the intra-family relationships in the Ovulidae.

The generic history of the Ovulidae began, in a sense, with LINNAEUS (1758), who used a single genus, *Bulla*, naming 23 species. Only 5 of these, *ovum*, *volva*, *spelta*, *verrucosa*, and *gibbosa* belong to the group we now consider ovulids; the name *Bulla* itself has, through taxonomic processes, been restricted to a group of shelled opisthobranchs.

Next, GRONOVIVS (1781) separated the ovulids from the broader Linnaean group under the name *Amphiperas*. However, in ICZN Opinions 260 and 261 (10 August 1954) the Commission "rejected for nomenclatural purposes the work of Meuschen issued in 1778 under the title *Museum Gronovianum*" (Opinion 260) and "rejected for nomenclatural purposes the Index to the *Zoophylacium Gronovianum* of Gronovius prepared by Meuschen and published in 1781" (Opinion 261).

Gronow did not publish *Amphiperas* and the publication of it by Meuschen was in a non-binomial work. Meuschen's work was accepted for a time; this explains why Schilder used the name in 1927 and 1932 but abandoned it in 1968. HERRMANNSEN (1846) validated *Amphiperas* but only as a synonym of the earlier *Ovula* of BRUGUIÈRE (1789).

SOWERBY^{1st} (1828) published a review recognizing this group, listing 24 ovulid species, 13 of which were new to science, under the variant spelling *Ovulum*. KIENER (1843) gave a more formal monographic treatment. SOWERBY^{2nd} (1848) and REEVE (1865) used the spelling *Ovulum*, in each case expanding the number of species as discovery at that time warranted. They also began broadening the generic concept by listing limited synonymies, incorporating generic names used by prior authors: *Amphiperas*, *Calpurnus*, *Radius*, and a part of the Linnaean *Bulla*. ROBERTS (1869-1870) compiled a catalog but did not attempt special or new generic treatment.

WEINKAUFF (1882) continued the use of the single genus *Ovula*, and like Sowerby^{2nd} and Reeve, he listed limited synonymies of the early authors. TRYON (1885) cited the genus *Ovula* without synonymy, though he did use 4 subgenera: *Cyphoma*, *Volva*, *Neosimnia*, *Calpurnus*, and, in error, a subgenus *Crithe* Gould, 1860. *Crithe* is not ovulid in nature and has later been assigned to another molluscan family, the Marginellidae.

SCHILDER (1927), in his work with the Cypraeacea (Cypraeidae, Ovulidae, Triviidae, Eratoidae) began what has since been a slow, steady, systematic structuring of the

ovulid species-groups by grouping together those species having similar shell morphology into a number of generic units with a significantly divergent common shell form; and by further recognizing the importance of locality and distribution details. Also the significance of their racial history (the dimension of time) began to emerge, and using fossil specimens Schilder attempted to establish and list the species in a phylogenetically related sequence (SCHILDER, personal communication).

Although Schilder's work was primarily with the Cypraeidae, he did concern himself with the Ovulidae to the extent of proposing several new tribal and subgeneric names. IREDALE (1930, 1931) contributed 4 new generic names: *Prionovolva*, *Diminovula*, *Phenacovolva*, and *Pellasiimnia* to accommodate further the expanding concept of the species groups. The following 2 Tables illustrate this development, thus making possible a better visual picture and understanding of the Ovulidae.

Table 1

SCHILDER, 1927	SCHILDER, 1932
AMPHIPERASIDAE	AMPHIPERATIDAE
Eocypraeinae	
<i>Cyproglobina</i> (<i>Cyproglobina</i>)	
<i>Cyproglobina</i> (<i>Pseudocypraea</i>)	
<i>Cypropterina</i> (<i>Cypropterina</i>)	
<i>Cypropterina</i> (<i>Jenneria</i>)	
Amphiperasinae	Amphiperatinae
Amphiperasini	Amphiperatini
<i>Sulcocypraea</i>	
<i>Primovula</i> (<i>Primovula</i>)	<i>Primovula</i> (<i>Primovula</i>)
	<i>Primovula</i> (<i>Diminovula</i>)
<i>Primovula</i> (<i>Pseudosimnia</i>)	<i>Primovula</i> (<i>Pseudosimnia</i>)
	<i>Primovula</i> (<i>Prosimnia</i>)
<i>Calpurnus</i>	<i>Prionovolva</i>
<i>Amphiperas</i>	<i>Calpurnus</i> (<i>Calpurnus</i>)
Simniini	<i>Calpurnus</i> (<i>Procalpurnus</i>)
<i>Simnia</i> (<i>Simnia</i>)	<i>Amphiperas</i>
<i>Simnia</i> (<i>Prosimnia</i>)	Volvini
<i>Simnia</i> (<i>Neosimnia</i>)	<i>Simnia</i>
<i>Cyphoma</i>	<i>Neosimnia</i>
<i>Radius</i>	<i>Cyphoma</i>
	<i>Volva</i>

APPENDED NOTES

The saying goes that the plans for a battleship become obsolete long before the ship's keel has been laid down. The work on the Ovulidae seems analogous in its own development pattern. An example of this is the apparent need to improve the placement of the genus *Dentiovula* by shifting it from near *Prionovolva*, where it was cited in CATE (1973: 13) to the vicinity of *Aperiovula*. One species, cited as *Delonovolva serrula* (*ibid.*, p. 59), seems rather to belong in the genus *Cuspidovula*.

I am retaining the separation of the genera *Phenacovolva* Iredale, 1930 and *Pellasiimnia* Iredale, 1931, although it seems difficult to recognize a clear-cut morphological division between them. However, tentative acceptance of the separation is based upon differences in shell characters, as defined in the Key to the Genera above.

HABE (1961: 41) proposed a new genus name, *Dentiovula*, for a markedly dentate group of species, with *Ovulum dorsuosa* Hinds, 1844 as type species; the name was repeated correctly as originally spelled, in the index (p. 151); in the Appendix (p. 14) the name is spelled in a different way, *Dentivolva*. Authors have cited both spellings, but no one seems to have pointed out their equivalence. Therefore, acting as "first reviser" under ICZN Code Art. 32-b I here propose to retain Habe's original spelling, *Dentiovula*, as the correct and valid one, with *Dentivolva* as an objective synonym.

SCHILDER (1927: 70, 80) misspelled the subfamily and tribus names of the genus *Amphiperas*: in SCHILDER (1932: 50, 51) he emended Amphiperasidae to Amphiperatidae, and Amphiperasini to Amphiperatini.

Table 2

SCHILDER, 1968	SCHILDER, 1971	CATE, 1973	CATE, herein
OVULIDAE	OVULIDAE	OVULIDAE	OVULIDAE
Eocypraeinae	Eocypraeinae	Eocypraeinae	Eocypraeinae
Eocypraeini	Eocypraeini	Eocypraeini	Eocypraeini
<i>Pseudocypraea</i>	<i>Pseudocypraea</i>	<i>Pseudocypraea</i>	<i>Pseudocypraea</i>
Cyproglobini	Cyproglobini	Cyproglobini	Jenneriini
<i>Jenneria</i>	<i>Jenneria</i>	<i>Jenneria</i>	<i>Jenneria</i>
Ovulinae	Ovulinae	Ovulinae	Ovulinae
Ovulini	Ovulini	Ovulini	Ovulini
		<i>Galera</i>	<i>Ovula</i>
		<i>Testudovulva</i>	<i>Galeravulva</i>
<i>Prionovulva</i>	<i>Prionovulva</i>	<i>Prionovulva</i>	<i>Testudovulva</i>
		<i>Dentiovulva</i>	<i>Prionovulva</i>
		<i>Margovulva</i>	<i>Margovulva</i>
		<i>Lacrima</i>	<i>Lacrima</i>
		<i>Globovulva</i>	<i>Globovulva</i>
<i>Pseudosimnia</i>	<i>Pseudosimnia</i> (<i>Pseudosimnia</i>)	<i>Pseudosimnia</i> (<i>Pseudosimnia</i>)	<i>Pseudosimnia</i> (<i>Pseudosimnia</i>)
	<i>Pseudosimnia</i> (<i>Diminovula</i>)	<i>Pseudosimnia</i> (<i>Diminovula</i>)	<i>Pseudosimnia</i> (<i>Diminovula</i>)
		<i>Pseudosimnia</i> (<i>Inflatovulva</i>)	<i>Pseudosimnia</i> (<i>Inflatovulva</i>)
		<i>Pseudosimnia</i> (<i>Labiiovulva</i>)	<i>Pseudosimnia</i> (<i>Labiiovulva</i>)
		<i>Xandarovulva</i>	<i>Xandarovulva</i>
		<i>Aperiovulva</i>	<i>Dentiovulva</i>
<i>Primovula</i> (<i>Primovula</i>)	<i>Primovula</i> (<i>Primovula</i>)	<i>Primovula</i> (<i>Primovula</i>)	<i>Aperiovulva</i>
<i>Primovula</i> (<i>Diminovula</i>)			<i>Primovula</i> (<i>Primovula</i>)
<i>Primovula</i> (<i>Prosimnia</i>)	<i>Primovula</i> (<i>Prosimnia</i>)		
		<i>Primovula</i> (<i>Adamantia</i>)	<i>Primovula</i> (<i>Adamantia</i>)
		<i>Stohleroma</i>	<i>Stohleroma</i>
		<i>Rotaovulva</i>	<i>Rotaovulva</i>
		<i>Crenavulva</i> (<i>Crenavulva</i>)	<i>Crenavulva</i>
		<i>Crenavulva</i> (<i>Serratovulva</i>)	<i>Serratovulva</i>
		<i>Crenavulva</i> (<i>Cuspidovulva</i>)	<i>Cuspidovulva</i>
		<i>Delonovulva</i>	<i>Delonovulva</i>
		<i>Carpiscula</i>	<i>Carpiscula</i>
<i>Procalpurnus</i>			
<i>Calpurnus</i>	<i>Calpurnus</i> (<i>Calpurnus</i>)	<i>Calpurnus</i> (<i>Calpurnus</i>)	<i>Calpurnus</i> (<i>Calpurnus</i>)
	<i>Calpurnus</i> (<i>Procalpurnus</i>)	<i>Calpurnus</i> (<i>Procalpurnus</i>)	<i>Calpurnus</i> (<i>Procalpurnus</i>)
<i>Ovula</i>	<i>Ovula</i>	<i>Ovula</i>	
		<i>Cyphoma</i>	
		<i>Pseudocyphoma</i>	
			<i>Simnia</i>
			<i>Subsimnia</i>
			<i>Simnialena</i>
			<i>Spiculata</i>
			<i>Sandalia</i>
			<i>Neosimnia</i>
			<i>Pellasisimnia</i>
			<i>Turbovula</i>
			<i>Cyphoma</i>
			<i>Pseudocyphoma</i>
			Volvini
<i>Simniini</i>	<i>Simniini</i>	<i>Simniini</i>	
<i>Simnia</i>	<i>Simnia</i>	<i>Simnia</i>	
<i>Cyphoma</i>	<i>Cyphoma</i>	<i>Subsimnia</i>	
		<i>Prosimnia</i>	
		<i>Simnialena</i>	
		<i>Aclyvulva</i>	
		<i>Cymbula</i>	
		<i>Spiculata</i>	
		<i>Dissona</i>	
		<i>Sandalia</i>	
		<i>Hiata</i>	
		<i>Kuroshiovulva</i>	
		<i>Neosimnia</i>	
		<i>Phenacovulva</i> (<i>Phenacovulva</i>)	
		<i>Phenacovulva</i> (<i>Pellasisimnia</i>)	
		<i>Phenacovulva</i> (<i>Calcaria</i>)	
		<i>Volva</i>	
<i>Pellasisimnia</i>	<i>Phenacovulva</i> (<i>Phenacovulva</i>)		<i>Phenacovulva</i>
	<i>Phenacovulva</i> (<i>Pellasisimnia</i>)		
<i>Volva</i>	<i>Volva</i>		<i>Calcarovulva</i>
<i>Volva</i> (<i>Phenacovulva</i>)			<i>Volva</i>

Schilder regarded *Jenneria* Jousseaume, 1884, as a subgenus of *Cypropterina* Gregorio, 1880, and therefore relegated the tribus name *Jenneriini* Thiele, 1929, to the synonymy under his later *Cyproglobini*. However, recent authors accept *Jenneria* as a full and separate genus, a ranking with which I concur. There remains, then, no reason for continuing to disregard *Jenneriini*, which has 3 years' priority over *Cyproglobini* Schilder, 1932, and I have recommended that it be reinstated.

In SCHILDER (1968: 272) the generic name *Volva* Röding, 1798, seems to have been inadvertently omitted. It should appear as line 14 of column 1, page 272, and the present line 14 should move to line 16, the present line 16 then being superfluous. It would also seem that the genus *Primovula* Thiele, 1925 (SCHILDER, *op. cit.*: 271), should be moved up and inserted just above *Diminovula* Iredale, 1930, for *Diminovula* is indicated as a subgenus of *Primovula*.

ADDENDA TO CATE, 1973

Included here are errors and omissions discovered after the printing of this work was completed: on page IV, add: NM – Natal Museum, Pietermaritzburg, South Africa; on page 1, in the 4th paragraph of the introduction, the citation SCHILDER & SCHILDER (1971) refers to: A catalogue of living and fossil cowries - taxonomy and bibliography of Triviacea and Cypraeaacea (Gastropoda Prosobranchia). Mém. Inst. Roy. Sci. Nat. Belg. (2) 85; and WILSON & GILLET (1972:62; plt. 44, fig. 8) refers to: Australian Shells. Charles E. Tuttle Co., Vermont & Tokyo, Japan; pp. 1 - 168; pls. 1 - 106; 34 text figs.

On p. 3, column 2, line 7, read: Binder, MHN;

p. 4, column 1, line 2, read: BUMO (not BUMC)

p. 4, column 1, lines 3 & 4, read Habe, NSMT and Kosuge, NSMT

ibid., line 11, read: James H. McLean

p. 10, column 1, line 6 from bottom, correct name to: [cf. *Primovula* (*Primovula*) *dautzenbergi*]

ibid., line 12, read: *Primovula* (*Adamantia*) *concinna*

p. 11, column 1, line 17: correct *Prionovolva frutica* (Reeve, 1865) to *Prionovolva pudica pudica* (A. Adams, 1854)

p. 11, column 2, line 10, correct *Prionovolva caledonica* to *Pseudosimnia* (*Diminovula*) *caledonica*

ibid., line 21 read: (see listing of *P. pudica pudica*)

p. 23, column 1, line 12, correct genus name from *Globovula* to *Prionovolva* (*bulli*)

p. 24, column 1, line 11, read: *Ovulum umbilicatum* Sowerby^{2nd}, 1848

p. 24, column 2, line 13, correct date 1800 to 1900

p. 24, species 42, line 2 of synonymy should read: *Ovula dentata* Fischer (von Waldheim)

p. 29, column 2, species 53, add parentheses to (Duclos, 1831)

p. 30, column 2, line 15, add to the discussion: I am naming this new species in honor of the late Archer Whitworth, of Geraldton, West Australia, who contributed much to our knowledge of the Cypraeaacea of that area.

p. 40, column 1, species 76, correct date in synonymy, *beckeri* Schilder, from 1841 to 1941

p. 43, column 2, line 20, correct *Pellasimnia* to *Prosimnia verconis* ...

p. 46, column 2, line 2, correct *P. (A.) fulguris* to *Pseudosimnia* (*Diminovula*) *fulguris* Azuma & Cate, 1971

p. 46, column 1, line 8 from bottom, read: NSMT

p. 52, column 1, line 2, the author's name should read Fischer (von Waldheim)

p. 79, column 2, line 3 from the bottom, read: *Aclyvolva clara* Cate, 1973;

p. 82, column 1, line 25, correct *Simnialena* to *Cymbula acicularis*

p. 87, column 1, line 13, correct *praenominate* to *praenominata*

p. 87, column 2, line 12: instead of 22 (4): ... read 11 (4): ...

pp. 92 and 93, correct date on *Phenacovolva* Iredale from 1939 to 1930

p. 94, species 184, correct name to *Phenacovolva* (*Phenacovolva*) *rosea lahainaensis*

p. 96, column 2, line 14 correct date from 1843 to 1848

on pp. 96, 99, 108, remove parentheses from the authors' names and date [Azuma & Cate, 1971]

p. 105, column 1, line 4 from bottom read: 8 March, 1933

p. 111, column 2, line 2 from bottom, read: NSMT

p. 112, column 1, bottom line, correct: (*striatus*) to (*semistriatus*)

In the Index the following corrections are needed:

p. 115, column 2, line 32, correct author's name to Fischer (von Waldheim)

p. 115, column 3: *formosa* (Verco), correct page reference from 52 to 42

p. 115, column 3: *formosa* (A. Adams & Reeve), delete page reference 52

p. 115, column 3, add new reference: *formosa* (Schilder) 50

p. 116, column 1, line 16, correct *nigeria* to *nigerina* ibid.: after *nigerina* add: *nigerrima* [Tryon, err.] 49

p. 116, column 1, *ovum*, add page reference 36 (species 66: line 2 of Discussion)

Synonymic Reassignments

- p. 60, species 122, add to synonymy:
1969 *Simnia aequalis vidleri*. Cate, The Veliger 12 (1): 100
- p. 76, species 150, add, after line 23:
1971 *Primovula inflexa*. Cate, The Veliger 13 (4): 363
- p. 85, column 1, after line 7, add:
1969 *Volva maccoyi*. Cate, The Veliger 11 (4): 365
1969 *Volva (Phenacovolva) exsul*. Cate, The Veliger 11 (4): 365
- p. 87, species 170, after line 17, add:
1971 *Primovula depressa*. Cate, The Veliger 13 (4): 362
- p. 96, species 187, add:
1971 *Phenacovolva recurva*. Cate, The Veliger 13 (4): 363
- p. 97, species 189, add:
1971 *Phenacovolva angasi*. Cate, The Veliger 13 (4): 363
- p. 98, species 190, add:
1971 *Phenacovolva subreflexa*. Cate, The Veliger 13 (4): 363
- p. 107, species 210, add:
1971 *Phenacovolva piragua*. Cate, The Veliger 13 (4): 363
- p. 108, species 211, add, after line 21:
1969 *Volva (Phenacovolva) birostris*. Cate, The Veliger 11 (4): 364; fig. 3

{Note: the figures in the cited paper were mislabeled in the preparation for reproduction.}

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