

CRIBRARULA FISCHERI ASTARYI* IS A FORM OF *C. CRIBRARIA

E. Heiman *)

Abstract: The taxonomic identity of *Cribrarula fischeri astaryi* is examined below using conchological criteria and procedures accepted in the project “Intraspecific variation in living cowries” and discussed in Heiman (2010). This taxon from Marquez’s Islands differs from *C. cribraria* by the more numerous teeth and the presence of larger than usual dark spots on the base and margins of the shell. *C. fischeri* Vayssiere, 1910 is a synonym of *C. cribraria*. *Cribrarula fischeri astaryi* is apparently a form of *C. cribraria* too because there is no scientific evidence regarding the existence in the waters of the Marquez’s Islands of a population of which the shells (or at least the majority) shares the diagnostic shell characters of *C. fischeri astaryi* sensu Schilder.

Key words: Mollusca, Gastropoda, Cypraeidae, *Cribrarula fischeri astaryi*, intraspecific variation, nomenclature, taxonomy.

The subspecies *Cribrarula fischeri astaryi* Schilder, 1971 from Marquez’s Islands was described in Schilder (1971a) in March 1971 based on two shells examined by Schilder personally in 1970—Fig. 1—and on the data of ten additional shells collected in 3 to 8 meters deep in the same area. Schilder then recognized *C. fischeri* as a valid species from the New Hebrides, New Caledonia, Fiji, and Samoa and considered that the shells in the batch from the Marquez’s Islands belong to *C. fischeri*. Students of cowries considered then that *C. fischeri* inhabits also the Hawaiian Islands.

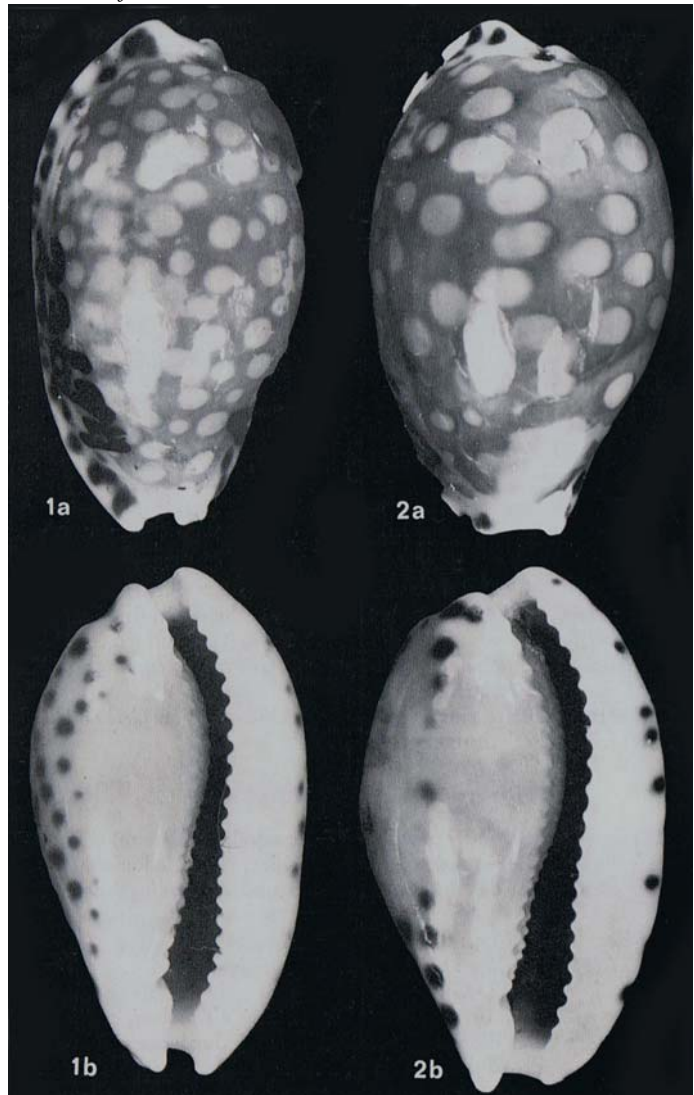
“These twelve shells recall *C. fischeri* Vayss...with regards to elongate shape, relative closeness of teeth, the slightly annulated dorsal lacunae, and the numerous blackish spots along both margins; but they differ by the larger dimensions and by the practically total absence of a well defined dorsal line.”[underlined by the present author]

Although the work by Schilder (1971a) is named “A new *Cribrarula*?” it is clear from the text that Schilder was dealing with a new subspecies:

“I think that these *Cribrarula* from the Marquesas Is. should be separated from the far more Western *C. fischeri* as a geographical subspecies.”

Schilder prepared another article for a German journal but did not finish this work. Another, posthumous description of this taxon (in German) was prepared by Maria Schilder and published as Schilder (1971b). Here the discussed taxon is named *Cribrarula fischeri astaryi* n. subsp. This description contains the same conchological information as in Schilder (1971a) plus small additions: the V-S formula for 12 *fischeri*—12(56) 17:16; for 12 *astaryi*—17(56) 21:21, and for 73 *Cribrarula cumingii* Sowerby (1832)—11(56) 27:23. I skip here the data of closeness of the teeth—a new characteristic used by the Schilders during the last years of their scientific work as a supplement to the V-S formula because its effectivity is not yet checked in the conchological practice. The diagnostic characters of *astaryi* given in the two latter works can be seen in Table 1. The same characters can partly be found also in *C. cribraria* (L., 1758) and *C. cumingii* (Sowerby, 1832), although the relatively large dark spots on the shell sides are not characteristic to *cribraria*. This seems to be the main conchological difference between *fischeri astaryi* and *cribraria*; a

difference in the number of teeth also exists but needs further examination on larger batches of shells. Shell characters of *C. cumingii* from the Marquez’s Is. are given in Table 1 for comparison.



1. The holotype #1 16.6 mm and a paratype # 2 17.4 mm; after Schilder (1971b)

The latter differs from *C. fischeri astaryi* by the dorsal lacunae with dark rings, the narrow and clear dorsal line, and by the substantially larger number of teeth.

It should be mentioned that *Cribrarula fischeri* (Vayssiere, 1910) is a synonym of *C. cribraria* (Linnaeus, 1758) according to Heiman (2009a). *Cribrarula gaskoini* (Reeve, 1846), of which shells are similar to those of *C. fischeri astaryi*, is a form or perhaps a subspecies of *C. cribraria* according to Heiman (2009b).

Table 1 Diagnostic characters of *C. fischeri astaryi* and similar taxa

shell characters		<i>fischeri astaryi</i>	<i>cribraria</i>	<i>cumingii</i>	notes
shape	elongate elliptical or elongate-oval to oval	V	V	V	
right side	callused, edged	V	V	V	
dorsal lacunae	distinctly annulated with brown/dark brown	—	—	V	
	slightly annulated	V	v	may be?	d
dorsal line	narrow, distinct, bordered by darker lines	—	—	V	
	a well defined line is practically absent	V	V	may be?	
lateral spots	dark small spots along both margins	V	V	V	
	larger dark spots together with small ones	V	—	V	
V-S formula, the numbers of teeth are normalized		17.56.24.24	22.57.20.1	11.56.37.3	e

Notes:

- The shell characters given in the original description are written in bold letters.
- The presence of the character in **all examined** shells of the taxon is designated by the sign ‘**V**’.
- Characters found sporadically are designated by the sign ‘v’.
- This means apparently the presence of darker rings around the whitish lacunae.
- In Schilder (1971a) the absolute numbers of the teeth are given. Therefore the formula looks like this: **17.56.21.21**; in the table the formula for *fischeri astaryi* includes the normalized teeth and it is compared with the formula for *C. cribraria melwardi* (Iredale, 1930), the most eastern group of populations of *C. cribraria*. Although it is known that *cribraria* is living in French Polynesia, its statistical conchological characteristics are yet unknown.

C. fischeri astaryi was mentioned as follows by students of cowries after the Schilders:

→Burgess (1977) treated it as a valid species in the genus *Adusta*: *Adusta astaryi* Schilder (1971) and mentioned the following diagnostic characters additional to the original description of *fischeri astaryi*:

“the lateral spotting is confined to the lateral margin. (In *gaskoini*, the spotting covers a portion of the dorsum.)” As the conchological practice shows, this phenomenon can be observed in shells of *gaskoini* but not in all its shells hence this is not a diagnostic character of a specific level.

“In addition, *astaryi* is a much more slender shell. Specimens I have seen have a low dorsal profile—never globular as in fully adult *gaskoini*.” This is also not correct as can be seen in Heiman (2009b).

In the same work Burgess mentioned *C. fischeri*: “Without questionit is a dwarf specimen of *Cypraea gaskoini*.”

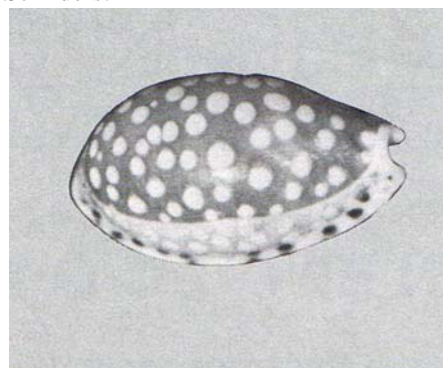
→In Burgess (1985) as *Cypraea astaryi* Schilder (1971); no new conchological information is added; the range of distribution of this taxon is mentioned as follows: American Samoa, New Hebrides, Fiji, Kwajalein; the Marquez’s Islands; the type locality of *fischeri astaryi* is not mentioned!

So the scientific evidence that this is a species is not presented.

→in Salvat & Rives (1990) and Richard & Hunon (1991) as *Cribrarula astaryi* (Schilder & Schilder, 1971)—as a valid species but two authors are mentioned instead of F.A. Schilder.

→In Burgess (1993) as a synonym of *C. taitae* Burgess, 1993, the taxon described after *C. fischeri astaryi*.

→ in Lorenz & Hubert (1993, 2000) and several subsequent works of Lorenz as a subspecies of *C. cumingii* (Sowerby, 1832). Shells similar to Fig 1 may somewhat resemble *C. cumingii* but they are not pyriform and destitute of narrow dorsal line and other diagnostic characters of *cumingii*. It is possible that the holotype of *fischeri astaryi* is a deformed shell in which certain characters of *cumingii* are absent as, for example in the shell Figs. 1-4 on Plate p. 23 of this issue. Several clear diagnostic characters separate *Cribrarula cumingii* (Sowerby, 1832) as a species from other taxa of the genus: the presence of dark rings bordering the dorsal lacunae, the narrow dorsal line bordered by brownish lines, numerous teeth—see a separate article on *C. cumingii* in this issue of Triton.



2. *C. astaryi* pictured in Burgess (1977); later this or a very similar shell was pictured by Burgess as *C. taitae*

Each individual of a species should share the main diagnostic characters of that species (including individuals of geographical subspecies, if there are subspecies). This “Species first” rule is explained in Heiman (2009c).

Hence the taxon described in Schilder (1971a) cannot be a subspecies of *cumingii* because the main diagnostic shell characters of *cumingii* are absent in *fischeri astaryi*. Perhaps the origin of this approach is a short anonymous (1988) note, in which an unusual shell of *C. cumingii* (we can name it form dilated) is pictured and, referring to Lorenz, is

named *C. astaryi*—Figs. 3-4. “The shape can vary notably, from elongated to deltoid, like the illustrated specimen. The strange conformation of the blotches, according to Mr. Lorenz, is due to injury suffered by the mantle of the mollusc.”

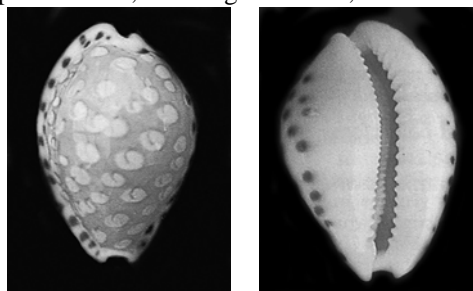
The present author also made a mistake in Heiman (2004) mentioning *astaryi* as a valid species. That book 2004 was based on the malacological literature rather than on the results of the project “Intraspecific variation in living cowries,” which was then in a stage of beginning.

How to treat *C. fischeri astaryi*?

Several clear diagnostic characters separate *C. cumingii* as a species from other taxa of the genus: the presence of dark rings bordering the dorsal lacunae, the narrow dorsal line bordered by brownish lines, and the numerous teeth. The taxon described as *C. fischeri astaryi* cannot be a subspecies of *C. cumingii* because the main diagnostic characters of *cumingii* are absent in *fischeri astaryi*. F.A. Schilder apparently considered this fact describing *astaryi* as a subspecies of *fischeri* and not of *cumingii*.

Certain shell characters of *C. fischeri astaryi* remind those of *C. gaskoini*. The difference between *C. gaskoini* and *C. cribraria* is not of a specific level because the diagnostic shell characters separating between them can be found in part of the shells and not in all shells. It is possible that *gaskoini* should be treated as a subspecies of *C. cribraria*. As is shown in Heiman (2009a) *C. fischeri* cannot be separated from *C. cribraria* at a specific level. Hence shells similar to *C. fischeri astaryi* represent a form of *C. cribraria*

There are reports of *C. cribraria* living in Polynesia. Shells described as *C. fischeri astaryi* from the Marquez’s Islands can be treated currently as a form of *C. cribraria* (a synonym) from this area. If a statistical conchological study of authentic material of *C. cribraria* from this area will be conducted in the future and such a study will reveal that the more numerous teeth and/or the larger dark spots on the shell side and base are present in the majority of *C. cribraria* populations here, these populations can even be treated as a subspecies of *C. cribraria*.



3-4. *C. astaryi*, after Anonymous (1988)

Conclusion

C. fischeri astaryi does not conform to the three criteria of a subspecies mentioned in Heiman (2010) and should be treated as a form of *Cribrarula cribraria*.

Acknowledgements

I would like to thank Mr. Henk K. Mienis for reading and correcting the first draft of this article.

Literature

- Anonymous. 1988. *Cypraea astaryi* Schilder, 1971. La Conchiglia (226-227):28.
- Burges, C.M. 1977. The ‘new’ cowries. Notes on more than a score of recently proposed species. HSN 25(12):1-8.
1985. Burgess’ Cowries of the World. 289 pp. Cape Town. Gordon Verhoef, Seacomber Publications.
1993. A new species of *Cypraea* from Samoa in the *C. cribraria* complex. The Veliger 36(2):174-177.
- Heiman, E.L. 2004. Diagnosing cowry species. Published privately. 160 pp.
- 2009a *Cribraria fischeri* Vayssiere, 1910, a synonym of *Cribrarula cribraria* (Linnaeus, 1758); its nomenclatural history and a comparative study of shell characters. Triton 20 Supplement 1.
- 2009b *Cribrarula gaskoini* (Reeve, 1846) an interesting form, which can perhaps be treated as a subspecies of *C. cribraria* (Linnaeus, 1758). Triton 20 Supplement 2.
- 2009c. A “species first rule”: an important criterion of subspecies. Triton 20:25.
- 2009d. Vayssi re-Schilder (V-S) formula for comparing cowry populations. Triton 20:28-29.
2010. A “Five-Criteria-Approach” (FCA) in taxonomy of Cypraeidae. Triton 21:10.
- Lorenz F. & Hubert, A. 2000. A Guide to worldwide Cowries. 584 pp. ConchBooks Hackenheim Germany.
- Richard, G. & Hunon, C. 1991. Cypraeidae of French Polynesia. Part one. Xenophora 55:11-42.
- Salvat, B. & Rives, C. 1975. Coquillages de Polyn sie. Les  ditions du Pacifique, Papeete-Tahiti. 392 pp.
1990. Coquillages de Tahiti. Delachaux et Niestl , Neuch tel, Paris. 158 pp.
- Schilder, F.A. 1971a. A new *Cribrarula*? Hawaiian Shell News 3:12.
- 1971b. Zur Kenntnis der Cypraeidae. 14. Eine neue *Cribrarula*. Arch. Mollu. 101(5/6):297-298.

*) heimel@netvision.net.il

Shells of several taxa of the genus *Cribrarula*



1-4. An unusual shell of *C. cumingii* (16 mm, Marquez's Is.) with a confused dorsal pattern, (obtained as *C. astaryi*). Author's collection



5-6. *C. taitae*. Pictured as *C. astaryi* in Burgess (1985)

7-8. *C. fallax*; the holotype, after Raybaudi (1986b)



9-10. *C. cribraria* f.exmouthensis, after Raybaudi (1987)

11. *C. haddnighiae*, Albany. After Raybaudi, 1986b.



12. *C. fallax*, from Denmark -Albany, West Australia. After Raybaudi, 1986b.