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ON THE SPECIES OF THE GENUS *CORBICULA* FROM CELEBES, INDONESIA

(MOLLUSCA: CORBICULIDAE)¹

Machfudz DJAJASAMITA

ABSTRACT

Some species of *Corbicula* from Celebes have been reviewed. Four of these are considered to be valid species: *C. linduensis* Bollinger, 1914, *C. loehensis* Kruimel, 1913, *C. matannensis* Sarasin & Sarasin, 1898 and *C. subplanata* von Martens, 1897. Each one of these species is redescribed.

INTRODUCTION

Eight species of *Corbicula* have been described from Celebes. Von Martens (1897) described *C. subplanata* and *C. celebensis*. The following year Sarasin & Sarasin (1898) added two more species: *C. matannensis* and *C. possoensis*. About 15 years later Kruimel (1913) described four species: *C. loehensis*, *C. mahalonensis*, *C. masapensis* and *C. towutensis*. One variety, *Corbicula moltkiana* var. *linduensis*, was described by Bollinger (1914).

Prashad (1930) revised the *Corbicula*'s from Sumatra, Java, Borneo, Celebes and West New-Guinea and recognized only two species out of the eight described from Celebes, i.e. *C. subplanata* and *C. celebensis*. He did not mention *C. moltkiana* var. *linduensis* however, which is considered to be a valid species in this paper.

After examination of type specimens at the Zoologisch Museum Amsterdam, the Netherlands (ZMA), and additional material of these species at the Museum Zoologicum Bogoriense, Bogor, Indonesia (MZB), the conclusion was made that only *C. linduensis*, *C. loehensis*, *C. matannensis* and *C. subplanata* have to be considered valid species, the others only being synonymous. The original descriptions of these four species are incomplete, hence a re-description of each of the species is presented.

¹ A contribution from the National Biological Institute of the Indonesian Institute of Sciences, Bogor, Indonesia.

Corbicula linduensis Bollinger, 1914

Corbicula moltkiana var. *linduensis* Bollinger, 1914: 575.

Shell thin, elongated, shining and little inflated. Posterior dorsal margin higher than the anterior one. Anterior part narrowed with rounded margin, posterior part somewhat elongated and wider, with truncated margin. Ventral margin straight or slightly arched, sometimes concave at the centre. Faint obtuse ridge present on posterior part, sloping from umbo. Periostracum yellowish to blackish green, fine and densely plicated on marginal area. Concentric ribs little distinct. Fine growth lines distinct. Lunula not distinct. Hinge teeth normal. Angle between anterior and posterior lateral teeth wide. Inner surface of valve violet, polished on margin below pallial line. Lateral and cardinal teeth light violet to whitish. Pallial line and muscle scars impressed.

The average measurements of 11 specimens examined: length 23.2 mm; height 14.7 mm; diameter 6.2 mm.

The localities of the specimens examined: Lake Lindu, March 1939, C. Bonne coll. (ZMA); Lake Lindu 950 m, July 22, 1972, M. Djajasasmita coll. (MZB)

Remarks: This species resembles *Corbicula moltkiana* Prime, 1878, a species from Sumatra, but can easily be distinguished by the shell sculpture and hinge teeth. *C. linduensis*, which was abundant in Lake Lindu once and an important source of animal protein for Lindu inhabitants (Bonne & Sandground, 1939), is now nearly extinct. Throughout the lake intensive surveys were carried out for collection purposes, but only one area was found in the river head of the Cumbasa outlet. The decrease of the population in the lake coincided with the introduction in 1951 of the mujair fish, *Tilapia mossambica* Peters, 1852. Whether or not this fish had a negative influence on the population of the bivalves is still a matter of discussion.

Corbicula loehensis Kruimel, 1913

Corbicula loehensis Kruimel, 1913: 232.
Corbicula masapensis Kruimel, 1913: 232.
Corbicula subplanata (part.), Prashad, 1930:203.

Shell ovate to elongate trigonal, inflated, shining, thin and somewhat transparent. Dorsal margin generally sloping steeper in front of umbo than behind it. On some shells posterior part strongly elongated, anterior margin rounded to truncate-roundish, sometimes angular at transition of dorsal and basal margin. Ventral margin arched. Concentric ribs generally fine and regular, sometimes weakly impressed and closely placed, becoming irregular on posterior part. Periostracum yellowish or ochreous. Umbo tumid. Ligament small. Lunula distinct. Inner surface of valve whitish violet, hinge area lighter in colour. Muscle scars and pallial line impressed. Hinge teeth normal, cardinal and lateral teeth not strongly developed.

The average measurements of 7 specimens examined of the form formerly called *C. masapensis*: length 24.7 mm, height 20.5 mm, diameter 11.6 mm. For the 'typical form' *C. loehensis* these figures for 18 specimens are respectively 19.2, 14.5, and 5.5 mm.

Localities of the specimens examined: Loeha I. in Lake Towuti, 1910/1912, E.C. Abendanon coll. (ZMA); Lake Wawantoa, 1931, R. Woltereck coll. (ZMA); Lake Masapi, 1910/1912, E.C. Abendanon coll. (ZMA); Lake Mahalona, September 22, 1972, W. Dharmawan S. coll. (MZB).

Remarks.- Prashad (1930) recognized this species as a synonym of *C. subplanata* and stated that young *subplanata* have a thin shell, but that fully grown specimens have a solid and quite heavy shell. After examination of the young and fully grown type specimens of *C. loehensis* it was found that they all had thin shells. Contrary to *C. subplanata*, *C. loehensis* has finer concentric ribs and weaker hinge teeth. It is similar to *C. masapensis* from lake Masapi, which has characteristics only slightly different from *C. loehensis*. The subadult form of *C. masapensis* is very similar to that of *C. loehensis*. For that reason *C. masapensis* and *C. loehensis* are considered to be one single species.

Corbicula matannensis Sarasin & Sarasin, 1898

Corbicula matannensis Sarasin & Sarasin, 1898: 92; Kruimel, 1913: 231.
Corbicula possoensis Sarasin & Sarasin, 1898: 92; Kruimel, 1913: 231.
Corbicula mahalonsensis Kruimel, 1913: 232.

Corbicula towutensis Krümel, 1913: 232.
Corbicula subplanata (part.), Prashad, 1930: 203.

Shell thick, ovate to trigonal, usually somewhat inflated. Anterior dorsal margin generally concave, posterior dorsal margin convex, posterior margin truncate-roundish, angular at transition to ventral margin. Anterior margin angular rounded. Dorsal margin sloping steeper in front. Ventral margin strongly arched. Umbo slightly inflated, light violet. Concentric ribs coarse, generally regular but irregular in the ventral area, closely placed, concentric growth lines fine. Ligament strong. Lunula small or not distinct. Periostracum olivaceous to blackish green, faintly shining. Inner surface of valve white to dark violet, especially at the ventral part, shiny below pallial line. Hinge teeth normal, lateral teeth straight or somewhat arched.

The average measurements of 30 typical specimens of *C. matannensis* examined: length 26.1 mm, height 23.6 mm, diameter 13.5 mm. One specimen of *C. mahalonensis*: 24.4, 20.2, 11.1 mm, respectively. Of 6 specimens of *C. towutensis*: 16.5, 14.7, 9.2 mm, respectively, and of 25 specimens of *C. possoensis*: 17.9, 14.3, and 8.8 mm, respectively.

Localities of the specimens examined: Lake Matano, 1910/1912, E.C. Abendanon coll. (ZMA); Lake Posso, 1910, E.C. Abendanon coll. (ZMA); Lake Mahalona, 1910/1912, E.C. Abendanon coll. (ZMA); Lake Towuti, 1910/1912, E.C. Abendanon coll. (ZMA); Kuramei, October 7, 1909, collector unknown (MZB); Tonusu river, Lake Posso area, June 26, 1972, W.P. Carney coll. (MZB); Lake Matano, September 24, 1972, W. Dharmawan S. coll. (MZB).

Remarks.—Sarasin & Sarasin (1898) described two species of *Corbicula* from Celebes, *C. matannensis* from Lake Matano and *C. possoensis* from Lake Posso. A series of each of these two species has been examined. Both show close similarity, only the angle between the anterior and posterior lateral teeth of *C. possoensis* is wider than that of *C. matannensis*. In comparison to *C. mahalonensis* from Lake Mahalona, *C. matannensis* differs only in the more elongated posterior part and rounded posterior margin. It appears that *C. mahalonensis* is merely a local form of *C. matannensis*. *C. towutensis* from Lake Towuti, which Prashad considered to be a synonym of *C. subplanata*, has quite

a different shell form and sculpture than the latter. *C. towutensis* is however closer related to *C. matannensis* and *C. possoensis*. It is also justified to regard *C. mahalonensis* a synonym of *C. matannensis*.

Corbicula subplanata von Martens, 1897

Corbicula subplanata von Martens, 1897: 112.
Corbicula celebensis von Martens, 1897: 113;
 Prashad, 1930: 203.
Corbicula subplanata (part.), Prashad, 1930: 203.

Shell more or less thick, elongated or rounded oval. Posterior part somewhat longer than anterior. Anterior margin rounded, posterior margin rounded and sometimes narrowed. Dorsal margin generally sloping steeper in front of umbo than behind it. Ventral margin arched. Umbo inflated, usually eroded. Ligament strong and lunula not or slightly distinct. Concentric ribs coarse, low and impressed, somewhat irregular and widely spread. Concentric growth lines fine. Periostracum brown, finely and densely plicated on ventral part. Inner surface of valve whitish or violaceous white, partially yellowish. Lateral teeth generally violet. Pallial line and muscle scars impressed, sometimes faintly impressed. Hinge normal.

The average measurements of 12 typical specimens of *C. subplanata* examined: length 23 mm, height 18.5 mm, diameter 11.9 mm. For 10 so-called specimens of *C. celebensis* these figures are 16.0, 13.4, and 8.8 mm, respectively.

Localities of the specimens examined: Minralang River near Lake Tempe, date and collector unknown (ZMA); Lake Tempe, 1889, M. Weber coll. (ZMA); Minralang River, 1889, M. Weber coll. (ZMA); Makassar, 1889, von Martens coll. (ZMA); Sanjuk near Palu, April 27, 1973, M. Jasin and Sujito coll. (MZB); Donggala Kecil, July 1973, M. Jasin coll. (MZB).

Remarks.—Von Martens (1897) described two species of *Corbicula* from Celebes, *C. celebensis* from lake Tempe, Minralang River near Lake Tempe and Makassar, and *C. subplanata* from Minralang River. The type specimens of *C. celebensis* from Makassar differ from those of Minralang River and Lake Tempe. The former have coarser and more widely spread concentric ribs, a more elongated

posterior part and they are closely similar to the young shell of *C. javanica* which is also known from Lake Tempe, Celebes. It is possible that these type specimens are nothing else but young shells of *C. javanica*. When type specimens from Lake Tempe and Minralang River are compared to those of *C. subplanata* the latter show flatter concentric ribs. Their subadult shells, however, are very closely similar to *C. celebensis*. It is reasonable to consider *C. celebensis* to be a subadult of *C. subplanata*.

ACKNOWLEDGEMENTS

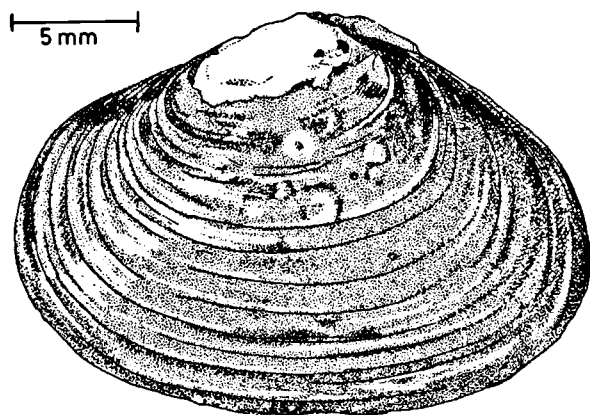
I wish to express my sincere thanks to Dr. H.E. Coomans, curator of the Molluscan Department of the Zoölogisch Museum Amsterdam, University of

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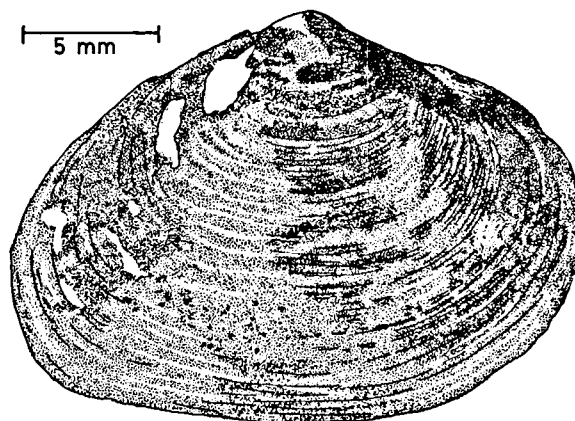
REFERENCES

- BOLLINGER, G., 1914. Süßwasser-Mollusken von Celebes. Ausbeute der zweiten Celebes-Reise der Herren Dr. P. und F. Sarasin. Rev. suisse Zool., 22: 557-579.
- BONNE, C. & J.H. SANDGROUND, 1939. Echinostomiasis in Celebes veroorzaakt door het eten van zoetwatermosselen. Geneesk. Tijdschr. Ned.-Ind., 34: 3016-3034.
- KRUIJL, J.H., 1913. Verzeichnis der von Herrn E. C. Abendanon in Celebes gesammelten Süßwasser-Mollusken. Bijdr. Dierk., 19: 217-235.
- MARTENS, E. von, 1897. Süß- und Brackwasser-Mollusken des Indischen Archipels. In: M. Weber, Zoologische Ergebnisse einer Reise in Niederländisch Ost-Indien, 4: 108-121.
- PRASHAD, B., 1930. Revision of the Asiatic species of the genus Corbicula, IV. The species of the genus Corbicula from the Sunda Islands, Celebes and New Guinea. Mem. Indian Mus., 9: 193-203.
- SARASIN, P. & F. SARASIN, 1898. Die Süßwasser-Mollusken von Celebes: 1-102. (Kreidel's Verlag, Wiesbaden).

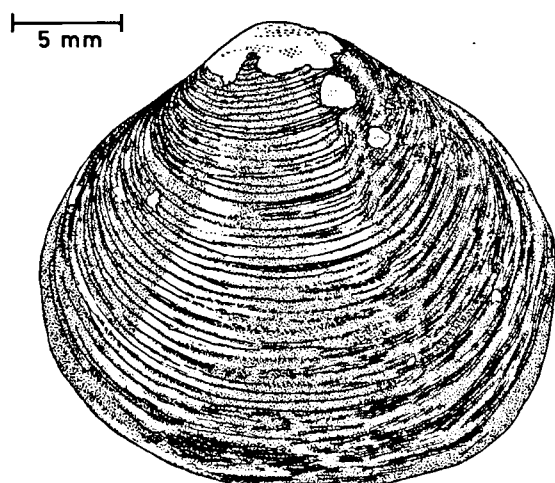
M. Djajasmita
Museum Zoologicum Bogoriense
Bogor, Java
Indonesia.



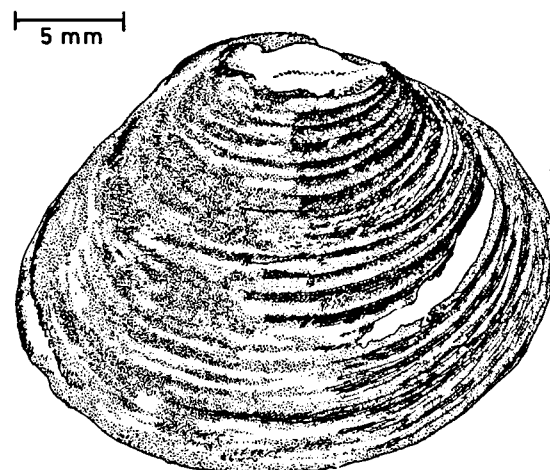
1 *C. linduensis* Bollinger



2 *C. loehensis* Krümel



3 *C. matannensis* Sarasin & Sarasin



4 *C. subplanata* von Martens

Species of *Corbicula* from Celebes, after specimens in the collections of the Zoölogisch Museum, Amsterdam. Drawings made by Mr. J. Zaagman.