

Müllers flu's (Bivalvia, Corbiculidae)

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The identification and confusion of three species of the genus *Corbicula* described by Müller in 1774 is discussed.

Key words: Bivalvia, Corbiculidae, systematics, Müller.

SAMENVATTING

De naamgeving voor de soorten in de familie *Sphaeriidae* (het specialisme van de Dr J.G.J. Kuijper) was erg ingewikkeld voordat hij zich met deze familie ging bezighouden. Bij de soorten van het geslacht *Corbicula* is dit veelal nog steeds het geval en het is niet zo dat er altijd een goed soortonderscheid te maken is aan de hand van alleen schelpkenmerken. Uit morfologisch en anatomisch onderzoek is gebleken dat *Corbicula fluminea* (Müller, 1774) en *Corbicula fluminalis* (Müller, 1774) duidelijk te onderscheiden soorten zijn.

De status en het voorkomen van *Corbicula fluviatilis* (Müller, 1774) is nog onduidelijk.

Ook het onderzoek van typemateriaal geeft niet altijd een oplossing. Het is echter wel een vereiste dat een goede documentatie met betrouwbare vindplaatsgegevens op de etiketten aanwezig is, hetgeen de wetenschappelijk waarde vergroot. Bij het *Corbicula* materiaal van Müller is dat helaas niet altijd het geval.

INTRODUCTION

This article is dedicated to Dr J.G.J. Kuiper in honour of his 90th birthday and 70 years of membership of the 'Nederlandse Malacologische Vereniging'. Although the species of the genus *Corbicula* are (much) larger than those of the genus *Pisidium*, we face the same problems and discussions about the identifications, nomenclature etc.

THE CASE

Shell collectors interested in the freshwater bivalves of the family Corbiculidae know that the identification and nomenclature of this group is confusing. Counts (1991) mentioned in his catalogue the existence of 462 recent and 127 fossil species. This is only a list and we realise that many names can be regarded synonyms (Prashad, 1928 a-d). Also Morton (1986:121) indicated that several Asian *Corbicula* species can be considered synonyms of the two better known species *Corbicula fluminea* (Müller, 1774) and *Corbicula fluminalis* (Müller, 1774).

He wrote: "I consider all invalid until such time as each and every one of them can be

shown to be biological different from *C. fluminalis* or *C. fluminea* which are now distinguished by a range of good characters not based on the shell, a feature clearly extremely variable in both species."

May be this opinion is a bit too strict but I do not deny the variability in shell characters, which gave rise to much confusion and too many different names (see the two examples below).

The fact that *Corbicula fluminea* is a valid species different from *C. fluminalis* is thoroughly examined recently (Rajagopal et al., 2000). Therefore I disagree with the conclusion of Mienis (1993) that *C. fluminea* in The Netherlands is a synonym of *C. fluviatilis*.

Problems arise when only empty shells are available for identification. Here are discussed two short examples based on shell characters only.

1. Many articles were published about the occurrence and distribution of *Corbicula* species in the United States. Sinclair & Isom (1963) studied the *Corbicula* species living in the Tennessee River water systems. They distinguished *Corbicula manillensis* (Philippi, 1841) from other species which are in fact nearly all junior synonyms of *C. manillensis*. The latter differs from *C. fluminea* by living in an other habitat. In their opinion *C. manillensis* lives mainly in fresh water and *C. fluminea* in brackish water. Later research (Britton & Morton, 1979) proved that *C. manillensis* is a synonym of *C. fluminea*.

The distribution of *Corbicula fluminea* in Europe (Csányi, 1999; Bij de Vaate & Hulea, 2000) shows that it is a freshwater species. Until now I do not have information concerning brackish water locations for this species with the exception of some Dutch river mouths, which are more or less brackish.

2. Brandt (1974), in his article on the freshwater molluscs of Thailand, described 28 species of *Corbicula*. In 1991, Kijviriya et al. demonstrated by using electrophoresis that 20 nominal species in Brandt are synonyms of *C. fluminea*.

Being an amateur malacologist I had the opportunity to study Müller's type-material in 1993. Dr Gittenberger (Naturalis, Leiden) with whom I published about the *Corbicula* species in the Netherlands (Gittenberger & Van Peursen, 1993) informed me that the type material of the three *Corbicula* species described by Müller in 1774 was received on loan from the Zoological Museum of Copenhagen (Denmark).

species	type locality	locality on label	info on label	info from Araujo et al. (1993)
<i>Tellina fluminalis</i> (390)	Asia, Euphrat	Euphrat	Expedition to Arabia 1763 - 1769 C.C. Niebuhr	'Lectotype of the Euphrates river, Mesopotamy'. Specimen agrees with the original description.
<i>Tellina fluminea</i> (391)	China	China, Canton	'At the moment there is nothing that connects this specimen with Müller' [T. Schiøtte, dec. 1989]	'There is no type designated properly.' Lectotype designated from Canton, China. Specimen agrees with the original description from Müller
<i>Tellina fluviatilis</i> (392)	China, Canton	China, Canton	Det. O.A.L. Mørch [Before 1804]	Neotype designated from the Spengler collection

With the types of *C. fluminea* and *C. fluminalis* (originally described in the genus *Tellina*) the specimens occurring in the Netherlands could be verified. However, the status of *C. fluviatilis* (Müller, 1774) is more difficult. At first, I do not have fresh specimens and in addition there is confusion between this species and *C. consobrina* (Cailliaud, 1823). Although *C. consobrina* seems to be related to *C. fluminalis*, I do not recognise the distinctive characters. Both species should occur in the river Nile in Egypt. To solve this, additional research will be necessary.

The original description by Müller (1774) was in Latin, a translation was published by Moolenbeek (1993).

Comparing the text from the original labels of the types with the information by Araujo et al. (1993) does not solve the confusion. In the table the information is summarised. For figures of the type material I can refer to Britton & Morton (1979).

CONCLUSIONS

1. *Corbicula fluminea* (Müller, 1774) and *C. fluminalis* (Müller, 1774) are distinct species.
2. A study of the type material was very useful, unfortunately the text on the labels added with Müller is confusing.
3. About *Corbicula fluviatilis* (Müller, 1774). I have doubts concerning its occurrence in the river Nile. Müller described this species from China (Canton) so how can the specimen from India (Tranquebar) in Müller's collection be explained?

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