

TWO NEW FRESHWATER MOLLUSCAN SPECIES FROM THE EARLY QUATERNARY OF THE NETHERLANDS

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Two new freshwater molluscan species are described from Early Quaternary deposits in The Netherlands. *Valvata* (*Valvata*) *salebrosa* n. sp. may be related to the Recent *Valvata sibirica* (Middendorff, 1851), whereas *Sphaerium* (*Sphaerium*) *subtile* n. sp. does not seem to have any affinity with Recent species.

Key words — Freshwater Mollusca, Quaternary, The Netherlands, new taxa.

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INTRODUCTION

Earlier this year, I reviewed the Quaternary freshwater Mollusca of The Netherlands (Meijer, 1990). Several new species were described. On acceptance of the manuscript of that paper for publication two additional (apparently new) species were found. Although their occurrence could still be noted in that paper, there was not enough time to include detailed descriptions, which are now given in this paper.

ABBREVIATIONS IN THE TEXT

The following abbreviations are used:

ITZ — Instituut voor Taxonomische Zoölogie collections (Amsterdam, The Netherlands).

| | |
|-------|--|
| LHB | — L.W. Hordijk collection (Brielle, The Netherlands) |
| RGD | — Rijks Geologische Dienst (Haarlem, The Netherlands) collections |
| RGM | — Nationaal Natuurhistorisch Museum (formerly Rijksmuseum van Geologie en Mineralogie) collections (Leiden, The Netherlands) |
| TMA | — T. Meijer collection (Alkmaar, The Netherlands) |
| 45B/7 | — RGD borehole file number |
| m | — metres below surface |
| H | — height of shell (in front view) |
| HB | — height of bodywhorl |
| HA | — height of aperture |
| W | — width of shell (gastropods); in bivalves W denotes the semidiameter |
| WA | — width of aperture |
| L | — length of shell |

All dimensions are in mm.

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The results of this study are published with the consent of the Director of the Rijks Geologische Dienst (Haarlem).

DESCRIPTIONS

Sphaerium subtile n. sp.

Pl. 1, Figs 1a-c, 2

1990 *Sphaerium* sp. [a very thin *Sphaerium*]. — Meijer, p. 166.

Holotype — Pl. 1, Fig. 1a-c, kept in the RGD molluscan collections.

Locus typicus — Pit Maalbeek, Belfeld, province of Limburg. Dutch coordinates (mapsheet 58E): 208.058/369.505.

Stratum typicum — Tegelen Formation (Tiglian, Early Pleistocene).

Derivatio nominis — *L. subtilis*, -is, -e (adj.) = thin, fragile, alluding to the thickness of the shell.

Diagnosis — A thin-shelled *Sphaerium* (*Sphaerium*) species, differing from *Sphaerium corneum* in its oblong shape.

Description — Shell compressed, transversely oblong. Umbones situated distinctly in front of the vertical midline, resulting in a produced posterior end. Posterior margin more broadly rounded than the anterior margin. Shell thin, comparable with *Sphaerium lacustre* (Müller, 1774). Outer surface with fine, regular lines which are more pronounced at both sides of the umbo. Shell irregularly undulate, according to the growth lines, resulting in pseudoribs which are especially prominent on the central part of the shell. Inner surface smooth; pallial line and adductor impressions shallow but distinct. Hinge with pronounced cardinals. Hinge plate narrow, especially between the cardinals and the anterior laterals.

Right valve (holotype): Ligament pit externally visible, distinct, rather long, reaching about 1/2 of the posterior part of the hinge plate. The largest width of the ligament pit equals about 2/3 of the width of the hinge plate. Cardinal teeth closer to the anterior than to the posterior laterals. Lateral teeth well developed, short, with bluntly triangular cusps. PI and AI of about equal size. Both are larger than the likewise equally sized PIII and AIII. C3 distinct, inverted U-shaped; poste-

rior leg bifid, slightly longer than the anterior leg, both legs almost reaching the edge of the hinge plate.

In other specimens the width of the ligament pit may reach 3/4 of the width of the hinge plate. Both legs of C3 may overhang the edge of the hinge plate.

Left valve: hinge generally corresponding to that of the right valve. AII and PII well developed, short, PII slightly longer than AII. C2 small, inverted V-shaped; both legs may overhang the edge of the hinge plate. C4 thin, semiparallel to the lower edge of the ligament pit; apex of C4 reaching up to c. 3/4 of the width of the hinge plate.

Dimensions — H 7.6, L 10.5, W 2.4 (holotype).

Material — RGD: pit Maalbeek, Belfeld (province of Limburg), Tegelen Formation (Tiglian): illustrated are the holotype (Pl. 1, Fig. 1a-c) and a paratype (Pl. 1, Fig. 2), an additional 29 paratypes (right valves: 3 adult specimens, 12 defective adult specimens, 2 juvenile specimens; left valves: 3 adult specimens, 7 defective adult specimens, 2 juvenile specimens).

RGM: pit Maalbeek, Belfeld (province of Limburg) (RGM 229 796: 1 right valve and RGM 229 797: 1 left valve). All specimens are from the Tegelen Formation (Tiglian).

RGD: boring Rosmalen 45B/6-7 (province of Noord-Brabant), 110.00-120.00 m (2 defective right valves); Tegelen Formation (Late Tiglian).

RGD: boring Rosmalen 45B/7 (province of Noord-Brabant), 110.80-113.00 m (1 right valve); Tegelen Formation (Late Tiglian).

RGD: boring Asperen 38H/178 (province of Zuid-Holland), 103.00-104.00 m (1 hinge fragment of a left valve); Tegelen Formation (Late Tiglian).

PLATE 1

Sphaerium subtile n. sp.

Fig. 1. Right valve (holotype); a: exterior view, $\times 6$; b: interior view, $\times 6$; c: hinge, $\times 12$.

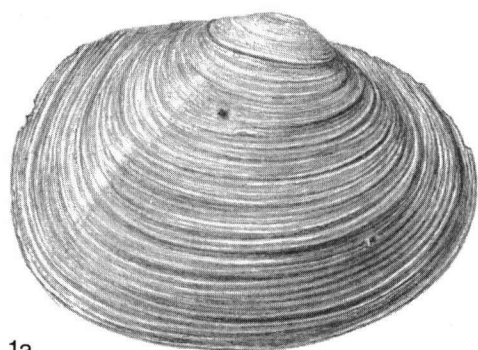
Fig. 2. Left valve (paratype), hinge, $\times 12$.

Valvata (*Valvata*) *salebrosa* n. sp.

Fig. 3. Holotype, $\times 12$; a: apical view, b: apertural view, c: umbilical view.

All specimens from Maalbeek pit, Belfeld (province of Limburg, The Netherlands); Tiglian, Tegelen Formation. RGD collection.

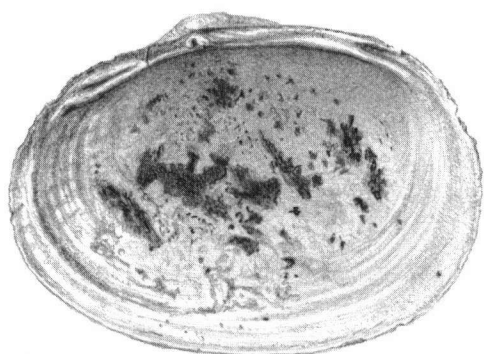
PLATE 1



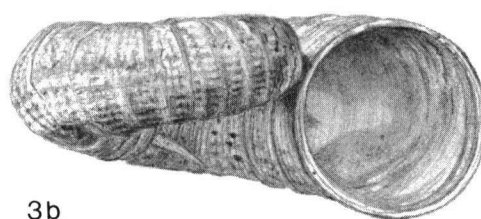
1a



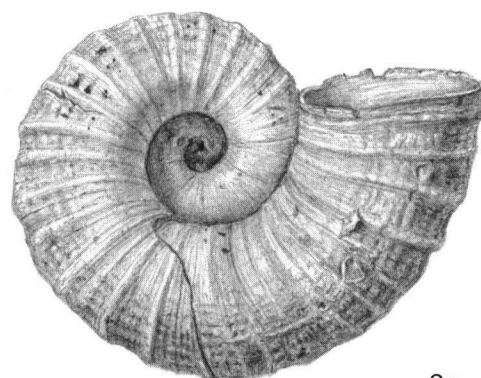
3a



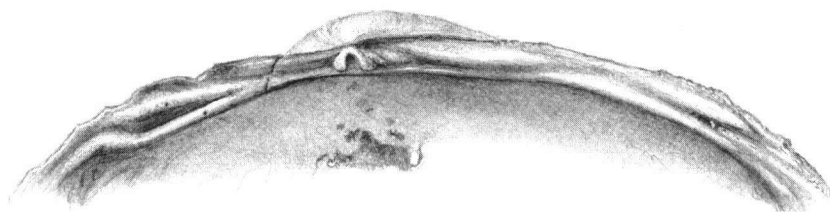
1b



3b



3c



1c



2

Remarks — At the type locality, the preservation of the shells is excellent. In most of the specimens (parts of) the periostracum is still present.

Sphaerium subtile n. sp. has an overall resemblance with the Recent North American *Sphaerium transversum* (Say, 1829). The hinge of the latter species, however, differs from the new species in the following respects: the width of the central hinge plate is much smaller and the shape of the cardinals differs considerably. Curiously, the hinge of *S. subtile* (the cardinals in particular) shows a rather close resemblance with that of *Sphaerium rosmalense* Meijer, 1990, from which it differs in almost all other respects. Records of the new species from boring Zuurland 37C/554 (Meijer, 1990) have proved to be erroneous. A closer look at the material of that boring confirmed the original identification as *Sphaerium rivicola* (Lamarck, 1818). Indeed, juvenile specimens of that species show an overall resemblance with *Sphaerium subtile* n. sp. However, *Sphaerium rivicola* of comparable size is much flatter, has a more ovate shape, a less pronounced umbo and coarser sculpture. Differences in shape of juvenile specimens of several species of *Sphaerium* are shown in Text-Fig. 1.

The recently described *Sphaerium icenicum* Holyoak & Preece, 1986 has a taller shell with a less produced posterior end. The sculpture is coarser and the hinge plate is broader and less straight. This species is similar to *Sphaerium rivicola*. From *Sphaerium corneum* (Linné, 1758) the new species differs in hinge characters; particularly the cardinals are of a different shape. Moreover, the shape of the shell is more oblong and inequilateral than that of *Sphaerium corneum*.

At the type locality, *Sphaerium subtile* n. sp. co-occurs with *S. rosmalense* and *S. corneum*. The first two of these species were also found together at Rosmalen.

The new species is so far known only from Tiglian deposits in The Netherlands.

Valvata (Valvata) salebrosa n. sp.

Pl. 1, Fig. 3a-c

1990 *Valvata* sp. [an unusual *Valvata* taxon]. — Meijer, p. 158.

Holotype — Pl. 1, Fig. 3a-c, kept in the RGD molluscan collections.

Locus typicus — Pit Maalbeek, Belfeld, province of

Limburg. Dutch coordinates (mapsheet 58E): 208.058/369.505.

Stratum typicum — Tegelen Formation (Tiglian, Early Pleistocene).

Derivatio nominis — *L. salebrosus*, -a, -um (adj.) = uneven, rough, alluding to the shell sculpture.

Diagnosis — A species of *Valvata* (*Valvata*) characterised by a large size and pronounced axial and longitudinal sculpture.

Description — Shell planorbid-shaped and with 2 3/4 rapidly expanding whorls which are well rounded and separated by a rather deep suture. On the upper side of the shell each whorl is more than twice as wide as the preceding one. The older whorls are slightly depressed. There is a wide umbilicus in which all whorls are visible. The greatest height of the shell lies at the aperture: the upper and lower apertural margins project beyond the plane of the spire. The aperture is detached from the preceding whorl. The peristome is continuous, almost circular, and not thickened.

The protoconch comprises about 1/2 whorl and is not sharply separated from the teleoconch. On the teleoconch, regularly spaced fine growth lines are present.

The teleoconch shows axial and spiral ornament. On the last whorl about 30 axial ribs can be

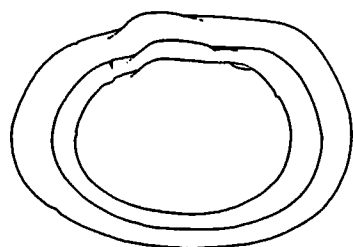
PLATE 2

Juvenile specimens of *Sphaerium* spp.

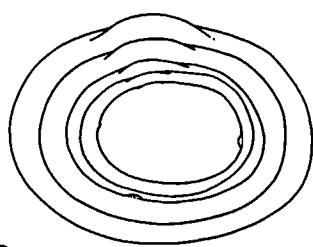
- Fig. 1. *Sphaerium subtile* n.sp., paratypes. Maalbeek pit, Belfeld (province of Limburg, The Netherlands), Tiglian (RGD).
- Fig. 2. *Sphaerium corneum* (Linné, 1758). Zandvoort and Diemen (province of Noord Holland, The Netherlands), Recent (TMA).
- Fig. 3. *Sphaerium lacustre* (Müller, 1774). Amsterdam (province of Noord Holland, The Netherlands), Recent (TMA).
- Fig. 4. *Sphaerium rivicola* (Lamarck, 1818). Dordrecht (province of Zuid Holland, The Netherlands), Holocene (RGD).
- Fig. 5. *Sphaerium icenicum* Holyoak & Preece, 1986; left valve. Bulchamp (England), Middle Tiglian (Norwich Crag) (Ph. Cambridge collection, Norwich, England).
- Fig. 6. *Sphaerium subsolidum* Clessin, 1888. Velsen (province of Noord Holland, The Netherlands), tunnel construction pit, Late Eemian (RGD).
- Fig. 7. *Sphaerium solidum* Normand, 1844. Biesbosch (province of Zuid Holland, The Netherlands), Recent (TAM).

a: left valves, b: right valves.
Bar length is 2 mm.

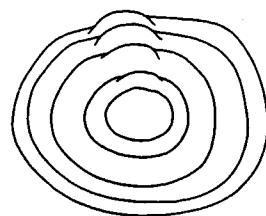
PLATE 2



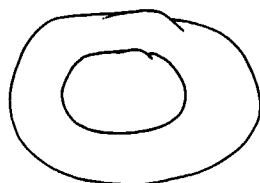
1a



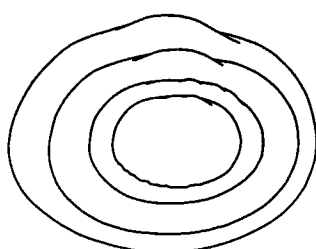
2a



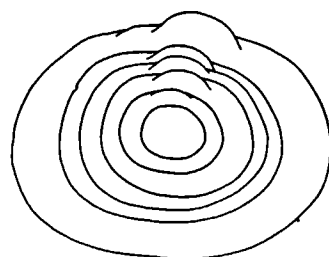
3a



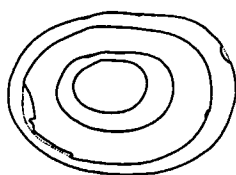
1b



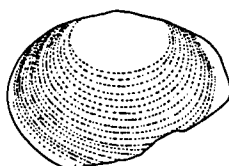
2b



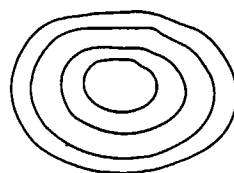
3b



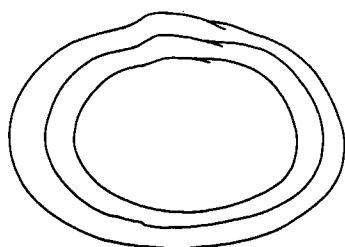
4a



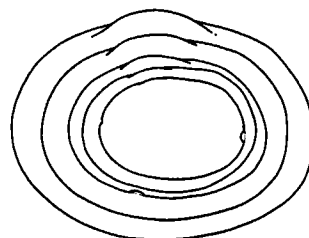
5



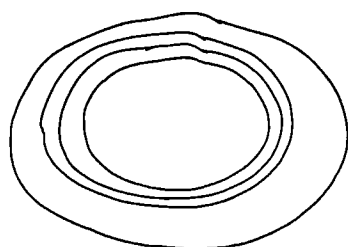
4b



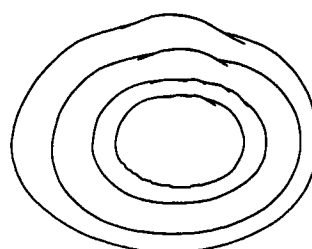
6a



7a



6b



7b

counted; these are more pronounced than the elevated spiral striae, although both elements may be of about equal magnitude. When the size of the striae approximates that of the axial ribs this gives rise to a lattice sculpture.

Dimensions — H 1.6, W 4.1, HA 1.6, WA 1.6 (holotype).

Material — Known from the Kedichem Formation at Bavel (province of Noord-Brabant) (1 specimen) and the Tegelen Formation at Maalbeek, Belfeld (province of Limburg) (5 specimens, amongst which the holotype). All material is housed in the molluscan collections of the RGD (Haarlem).

Remarks — The new species is particularly characterised by its size and sculpture. In overall shape, there is a strong resemblance with *Valvata cristata* Müller, 1774 and consequently, contrary to the opinion expressed in Meijer (1990), the new species appears to be more closely related to that species than to *V. pulchella* Studer, 1820. *Valvata salebroso* n. sp. is larger than *V. cristata*, which, in addition, has a completely smooth and shiny shell.

The Pliocene species *V. marginata* Michaud, 1855 also has a smooth and shiny shell but in some cases has varices; it never shows a regular pattern of axial ribs and is very closely related to, if not conspecific with, *V. cristata*.

From the ITZ collections I was able to study the Recent *V. frigida* Westerlund, 1873 which, according to Zhadin (1965, p. 165), is a variety of *V. sibirica* (Middendorff, 1851). General shape, dimensions, number of whorls, and shape of the aperture are similar to what can be seen in the new species. The last whorl in *V. frigida*, however, is set below the preceding one, which is not the case in *V. salebroso* n. sp. Furthermore, *V. frigida* differs

from the latter in its finer sculpture and in the absence of axial ribs, although isolated coarser ridges often occur (Zhadin, 1965). I was unable to directly compare *Valvata sibirica* with *V. salebroso* n. sp.; it is said to have a sculpture consisting of "densely set, fine, sharp transverse ridges" (Zhadin, p. 165), which would suggest that this species also has a finer sculpture than does *V. salebroso* n. sp. I assume both *V. frigida* and *V. sibirica* to be closely related to *V. salebroso* n. sp.

Valvata salebroso n. sp. has so far been found only in Early Pleistocene (Tiglian and Bavel Interglacial) deposits of The Netherlands.

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