

# The types of *Gibbula nehalenniae* van Regteren Altena, 1954 (Mollusca, Gastropoda) re-investigated

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The specimen in the Naturalis collections labelled as holotype of *Gibbula nehalenniae* van Regteren Altena, 1954 is actually a juvenile specimen of *Gibbula octosulcata* (Nyst, 1835). It is demonstrated that an unfortunate and so far unnoticed mix-up has occurred. To ensure a future stable nomenclature in a group of closely similar species, including *G. nehalenniae* and *G. octosulcata*, a neotype for *G. nehalenniae* is designated, described and illustrated. A summary of the remaining type specimens of *G. nehalenniae* is added.

KEYWORDS: lost type, neotype, Pliocene, North Sea Basin.

## Introduction

Van Regteren Altena (1954) introduced *Gibbula nehalenniae* from Pliocene deposits in several boreholes in The Netherlands. The same species had previously been recorded by Beets (1946), misidentified as *Gibbula pennanti* (Philippi, 1851) and as *Gibbula* spec. 1. In fact, van Regteren Altena effectively included all specimens in the two taxa discussed by Beets in the type series of *G. nehalenniae*, indicating one of these as the holotype (from borehole Haamstede 42B0005, depth 96.60-103.30 m below surface) and also referred to 61 paratypes in the material recorded by Beets (1946).

No illustrations of the holotype or paratypes were given, but reference was made to photographs of two specimens of *Gibbula* spec. 1 in Beets (1946, pl. 1, figs 28-29 and 30-31), both of them paratypes (now RGM.1007837.a and RGM.1008147.a, respectively).

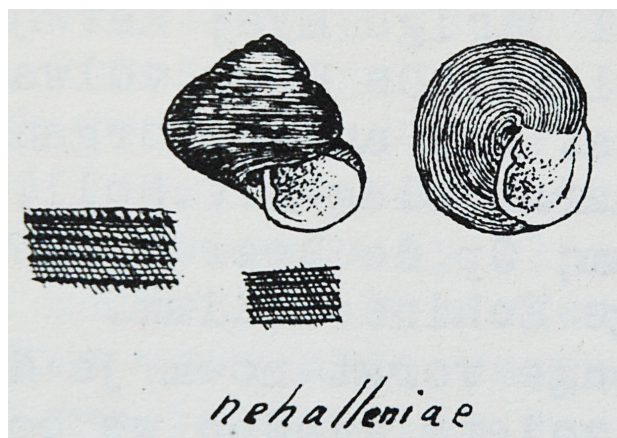
At that time all included specimens were housed in the mollusc collection of the Geological Survey of The Netherlands at Haarlem. In 2005 this collection was incorporated in the collection of Cainozoic Mollusca at Naturalis Biodiversity Center, Leiden.

In the same *Basteria* issue in which the new species was published, the first contribution of a series on fossil shells from Dutch beaches and estuaries also appeared, in which a short description and illustration of *G. nehalenniae* was included (van Regteren Altena *et al.*, 1954, pl. 3, fig. 21, reproduced herein as Fig. 1). That specimen, however, is not part of the type series, but most likely represents a derived shell originating from one of the beach or estuary localities in the southwestern part of The Netherlands, and its present whereabouts is unknown.



**Figure 1.** *Gibbula nehalenniae* van Regteren Altena, 1954, as illustrated in van Regteren Altena *et al.* (1954, pl. 3, fig. 21). Reproduction of the actual water-colour by L.P. Pouderooyen, kept in the Naturalis archives.

Spaink (1957), at the time a researcher at the Geological Survey (Haarlem), published an illustrated key on Recent and fossil *Gibbula* species known from The Netherlands. He noted that his illustrations of *Gibbula nehalenniae* and some of the other species were based on the holotypes. As far as is known his image of the *G. nehalenniae* holotype is the only one ever published (reproduced herein as Fig. 2).



**Figure 2.** *Gibbula nehalenniae* van Regteren Altena, 1954, **holotype** as illustrated in Spaink (1957). Note the spelling error ‘nehallenniae’ on the drawing.



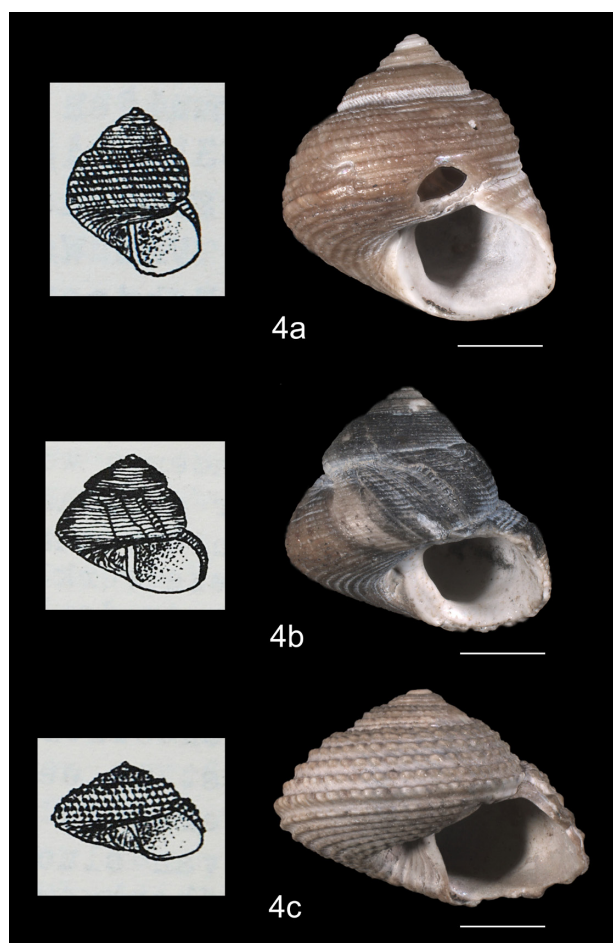
**Figure 3.** Juvenile *Gibbula octosulcata* (Nyst, 1835), erroneously labelled as being the holotype of *Gibbula nehalenniae* (RGM.783102). Scale bar represents 2 mm.

### The holotype: a problem

Re-investigation of the type material of *G. nehalenniae* revealed that both the specimen labelled as being the holotype (RGM.783102, Fig. 3) and one of the remaining 49 (of the original 61) paratypes (RGM.1008150) are actually juvenile specimens of *Gibbula octosulcata* (Nyst, 1835), a well-known species accompanying *G. nehalenniae* in Pliocene deposits of the southern North Sea Basin (Pouwer & Wesselingh, 2012). The two most likely explanations of this error are misidentification or misplacement of specimens.

Juvenile specimens of *G. octosulcata* have a similar outline to relatively low specimens of *G. nehalenniae* and their ornamentation is also comparable. On closer examination, however, distinct differences in ornamentation are obvious. In *Gibbula octosulcata* spiral ribs are well developed, bearing coarse nodules and separated by rather wide interspaces. Distinct axial elements, if present, are only developed along the base of the spirals but lacking in the interspaces. *Gibbula nehalenniae* has finer and more close-set spirals, with fine nodules. The oblique axial ridges in the latter species are very fine but distinct and are seen both on spirals and in the interspaces.

Misidentification and unfortunate designation of a misinterpreted specimen as the holotype cannot be excluded. The occurrence of yet another specimen of *G. octosulcata* in the type series supports this. Dimensions of the holotype as given by van Regteren Altena (1954) (height 6 mm, diameter 7 mm) and measured for the specimen actually labeled as ‘holotype’ (height 5.9 mm, diameter 7.3 mm) are closely similar, but such proportions are not uncommon among the many available examples of this species. However, both Beets and van Regteren Altena were highly experienced malacologists and taxonomists. It is unlikely that both of them misidentified two specimens. It is even more unlikely that van Regteren Altena designated as holotype one of the two aberrant specimens out of the 62 available specimens, among which were numerous well-preserved examples.



**Figure 4.** Drawings of three *Gibbula* species based on their holotypes as published in Spaink (1957) and the actual specimens. 4a: *Gibbula beetsi* van Regteren Altena, 1954 (**holotype**, RGM.783103); 4b: *Gibbula spastica* Beets, 1946 (**holotype**, RGM.783104); 4c: *Gibbula gelriana* Beets, 1946, (**holotype**, RGM.783118). Scale bars represent 2 mm.

Another much more likely possibility is the replacement of the holotype with another shell. In 60 years of curation and after at least three major re-housings this seems to be the most probable explanation. A strong indication for this scenario is the difference between Spaink's (1957) drawing of the holotype (reproduced herein as Fig. 2) and the shell presently labelled as being the holotype (Fig. 3). Spaink based his illustration of *G. nehalenniae* on the holotype and his drawings of *Gibbula beetsi* van Regteren Altena, 1954, *G. spastica* Beets, 1946 and *G. gelriana* Beets, 1946 were also based on the respective holotypes. Spaink's drawings are no masterpieces of art work, but are sufficiently accurate to differentiate the species concerned and to give a fair impression of the actual type specimens. This is demonstrated by the drawings of the three other species' holotypes, that are very similar to the actual specimens (here illustrated as Fig. 4). In the case of *G. nehalenniae*, however, the differences in shape and ornamentation between the drawing and the actual specimen are large (compare Figs 2 and 3). These circumstances are here considered to demonstrate beyond doubt that the specimen presently labelled as being the holotype is not the holotype as designated by van Regteren Altena (1954) and drawn by Spaink (1957) and it must be assumed that it has been inadvertently replaced by another shell. As the real holotype was never sufficiently well illustrated it cannot be recognized in the available type material and therefore it must be considered lost.

### Neotype designation

To ensure a future stable nomenclature in this group of the closely similar species *Gibbula nehalenniae*, *G. octosulcata*, *G. beetsi*, *G. spastica* and *G. obconica* (Wood, 1842), a neotype for *G. nehalenniae* is here designated, described and illustrated.

*Neotype* – Specimen RGM.1008158 (Fig. 5), selected from paratype sample RGM.1008153.

*Neotype locality* – Haamstede (province of Zeeland, The Netherlands), borehole 42B0005 (old number 576.5); depth 96.60-103.30 m below surface (Pliocene, Oosterhout Formation); same as the original type locality.

*Neotype description* – Shell 6.1 mm high and 6.7 mm wide, with 5.5 slightly convex whorls. The base is convex and the umbilicus closed by a (slightly damaged) callus. The outer lip of the wide aperture is positioned at an angle of *c.* 45° to the vertical axis. Internally the outer lip is slightly thickened and a weak parietal tooth is present. The protoconch of the shell is present, but insufficiently well preserved to observe the boundary between proto- and teleoconch.

The teleoconch has an ornamentation of fine spiral ridges of varying strength, of which seven are present on the penultimate whorl. The interspaces between the spiral



**Figure 5.** *Gibbula nehalenniae* van Regteren Altena, 1954 (**neotype**, RGM.1008158). Haamstede (province of Zeeland, The Netherlands), borehole 42B0005, depth 96.60 -103.30 m below surface, Pliocene, Oosterhout Formation. Scale bar represents 2 mm.

ridges are as wide as the spirals themselves or slightly narrower. On the body whorl a narrow groove bisects the spirals and a weak secondary spiral develops in some of the interspaces. The base of the shell has *c.* 10 spiral ridges, separated by slightly wider interspaces. The teleoconch is covered with fine, axial ridges, obliquely situated parallel to the apertural margin. The intersection of axial and spiral elements produces fine nodules on the spirals. Elongated reddish color spots are present on the spiral ridges. The neotype shows evidence of repairs to several breakages encountered during life.

*Variability* – The paratype material demonstrates moderate variation in height/width-ratios. Most shells are slightly wider than high but specimens somewhat higher than wide are present as well. The number of spiral ridges on the penultimate whorl varies from seven to nine. In some specimens the groove on the primary spirals is already visible on the penultimate whorl. The color spots are occasionally less elongated than in the neotype.

*Discussion* – Both Glibert (1957) and Marquet (1995, 1998) considered *Gibbula nehalenniae* to be a forma or subspecies of *Gibbula obconica* (Wood, 1842). Pouwer & Wesselingh (2012) rejected this point of view, arguing that *G. obconica* is distinguished by having a relatively higher shell and finer spiral ridges with more distinct

nodules, and by the presence of far more numerous spirals on the base and a larger aperture spanning more than half of the shell width. Even if both taxa do not occur in the same stratigraphic level (Marquet, 1995, pp. 68-69; 1998, pp. 43-44) these differences are considered of major importance, justifying a distinction at species level.

*Gibbula beetsi* van Regteren Altena, 1954 is usually higher than wide. It has fewer and stronger spiral ridges (four to six on the penultimate whorl), stronger axial ridges and coarser nodules on the spirals.

*Gibbula octosulcata* is distinguished by having coarser, fewer and less close-set spirals with coarser nodules. Axial elements, if at all present, are only visible along the base of the spirals. In the relatively wide spiral interspaces one to five fine secondary spirals are present.

*Gibbula spastica* Beets, 1946 is possibly a high form of *G. nehalenniae*. Its secondary spiral elements rapidly develop to become as strong as the primary ones. Only three or four specimens of this taxon are known. More material and further study is needed to clarify its status.

### Paratypes

Of the original 61 paratype specimens mentioned by van Regteren Altena (1954) only 49 now remain in the Naturalis collection (Table 1), one of which is selected as

Registration number	Locality	Borehole number	Borehole number (old)	Depth (mbs)	Type status	Specimens	Name in Beets (1946)	Remarks
RGM.783102	Haamstede	42B0005	576.5	96.60-103.30	'holotype'	1	<i>Gibbula spec. 1</i>	= <i>G. octosulcata</i>
RGM.1008158	Haamstede	42B0005	576.5	96.60-103.30	neotype	1	<i>Gibbula spec. 1</i>	
RGM.1007837.a	Hoogeveen	17C0037	239.13	133.50-134.20	paratype	1	<i>Gibbula spec. 1</i>	pl.1, figs 28-29 in Beets (1946)
RGM.1007837.b	Hoogeveen	17C0037	239.13	133.50-134.20	paratypes	2	<i>Gibbula spec. 1</i>	
RGM.1007838	Dorst II	44D0087	624.85	121.90-141.95	paratype	1	<i>Gibbula spec. 1</i>	
RGM.1008147.a	Biggekerke (D)	48A0004	656.40	24.40-27.80	paratype	1	<i>Gibbula spec. 1</i>	pl. 1, figs 30-31 in Beets (1946)
RGM.1008147.b	Biggekerke (D)	48A0004	656.40	24.40-27.80	paratypes	2	<i>Gibbula spec. 1</i>	
RGM.1008148	Dorst III	44D0088	624.86	129.50-133.50	paratypes	2	<i>Gibbula spec. 1</i>	
RGM.1008149	Biggekerke (E)	48A0005	656.41	26.70-30.50	paratype	1	<i>Gibbula spec. 1</i>	= <i>G. octosulcata</i>
RGM.1008150	Biggekerke (E)	48A0005	656.41	26.70-30.50	paratypes	2	<i>Gibbula spec. 1</i>	
RGM.1008151	Vlissingen, De Schelde 1940	48C0080 & 48C0082-48C0087	656.67-656.73	unknown	paratypes	2	<i>Gibbula spec. 1</i>	
RGM.1008152	Koudekerke (G)	48A0007	656.43	23.00-25.50	paratypes	10	<i>Gibbula spec. 1</i>	
RGM.1008153	Haamstede	42B0005	576.5	96.60-103.30	paratypes	14	<i>Gibbula spec. 1</i>	*
RGM.1008154	Deventer, waterleiding	27G0026	394.6	110.40-128.00 & 120.00-128.00	paratypes	4	<i>Gibbula spec. 1</i>	
RGM.1008155	Haamstede	42B0005	576.5	96.60-103.30	paratypes	2	<i>Gibbula pennanti</i>	
RGM.1008156	Koudekerke	48A0001	656.37	27.50-31.00	paratype	1	<i>Gibbula pennanti</i>	
RGM.1008157	Oss	45E0009	570.3	32.50-52.00	paratype	1	<i>Gibbula pennanti</i>	

**Table 1.** Type specimens of *Gibbula nehalenniae* van Regteren Altena, 1954, present in the collection of Cainozoic Mollusca Naturalis.

\* additionally 1 paratype donated to P.E.P. Norton and 9 paratypes donated to M. de Smit.

neotype herein. All samples listed by Beets (1946) and referred to by van Regteren Altena are present. Beets did not mention the number of specimens per sample, which makes it difficult to ascertain which paratypes are missing. Sample RGM.1008153 contains a note by G. Spaink that in 1962 he presented one paratype to his colleague and friend P.E.P. Norton. This specimen is now housed in the Norwich Castle Museum (Norfolk, UK). Another note in the same sample is less clear. A handwritten note, probably by van Regteren Altena, states 'de Smit 9 ex.', which obviously indicates that nine specimens were donated to Mr M. de Smit, of The Hague, who since 1955 was an active member of the Netherlands Malacological Society. The present whereabouts of his collection is unknown.

### Acknowledgements

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