

Rediscovery of the syntype series of *Astarte omalii* de la Jonkaire, 1823 and *Astarte basterotii* de la Jonkaire, 1823 (Mollusca, Bivalvia, Astartidae)

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According to the recent literature the type material of the bivalve species *Astarte omalii* de la Jonkaire, 1823 and *Astarte basterotii* de la Jonkaire, 1823 could not be traced. Therefore, and also because of existing confusion between these taxa, neotypes were designated. Recently, however, the syntype specimens of these species were located in the collections of the Muséum National d'Histoire Naturelle (Paris, France). Previously designated neotypes are set aside and the rediscovered samples again become the name-bearing type material. The two syntype series are analysed and illustrated, and lectotypes and paralectotypes are designated.

KEY WORDS: Mollusca, Bivalvia, *Astarte*, *Laevastarte*, type designation, lectotype, paralectotype

Introduction

De la Jonkaire (1823) introduced four new species of the bivalve genus *Astarte* from Pliocene strata in Belgium, including *A. omalii* and *A. basterotii*. In 2009, the original type material of these two species could not be located in the collections of the Muséum National d'Histoire Naturelle (Paris) or the Institut Royal des Sciences Naturelles de Belgique (Brussels, Belgium) (pers. comm. D. Merle and R. Marquet, respectively) (Pouwer, 2010). As the original types had to be considered lost and as valid name-bearing types were considered essential to solve existing taxonomic confusion, Pouwer (2010) designated neotypes for both species. However, recently the first author rediscovered the syntype series of de la Jonkaire in the paleontological collections of the Paris Museum, which makes the neotypes invalid, following Art. 75.8 of ICZN. The two syntype series are here studied and illustrated, and lectotypes and paralectotypes are designated. Each series actually contains several species, a phenomenon often encountered in eighteenth and nineteenth century type series.

The following abbreviations are used:

MNH.N.F Muséum National d'Histoire Naturelle, Collection de Paléontologie (Paris, France).

RGM Naturalis Biodiversity Center, Collections Department, Cainozoic Mollusca (Leiden, The Netherlands).

The syntype series of *Astarte omalii* de la Jonkaire, 1823

The syntype series of *Astarte omalii* de la Jonkaire, 1823 was collected by P.L. Duclos at Antwerp (Belgium). The original label (Figure 1) not only gives these data, but also the journal in which de la Jonkaire's paper was published and the figure number ('fig. 1'), herein reproduced as Figure 2. The syntype series contains seven valves, belonging to three currently recognised species: *Laevastarte omalii* (de la Jonkaire, 1823), *L. bipartita* (J.D.C. Sowerby, 1826), and *L. ariejansseni* (Marquet, 2005) (Table. 1; Figures 3-9). Only two specimens belong to *L. omalii*, corresponding very well to the original description: swollen shell, some ribs on the central part, becoming more numerous at the umbo, crenulated edge,

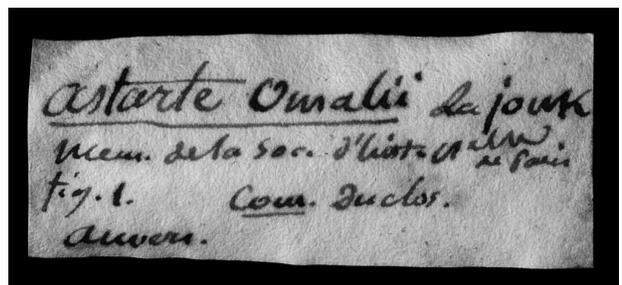


Figure 1. Original label accompanying the syntype series of *Astarte omalii* de la Jonkaire, 1823.

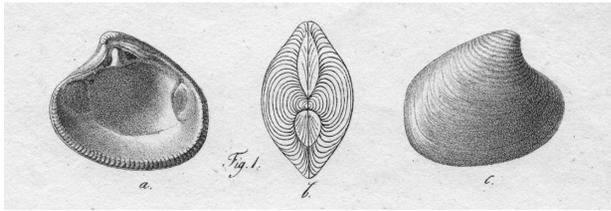


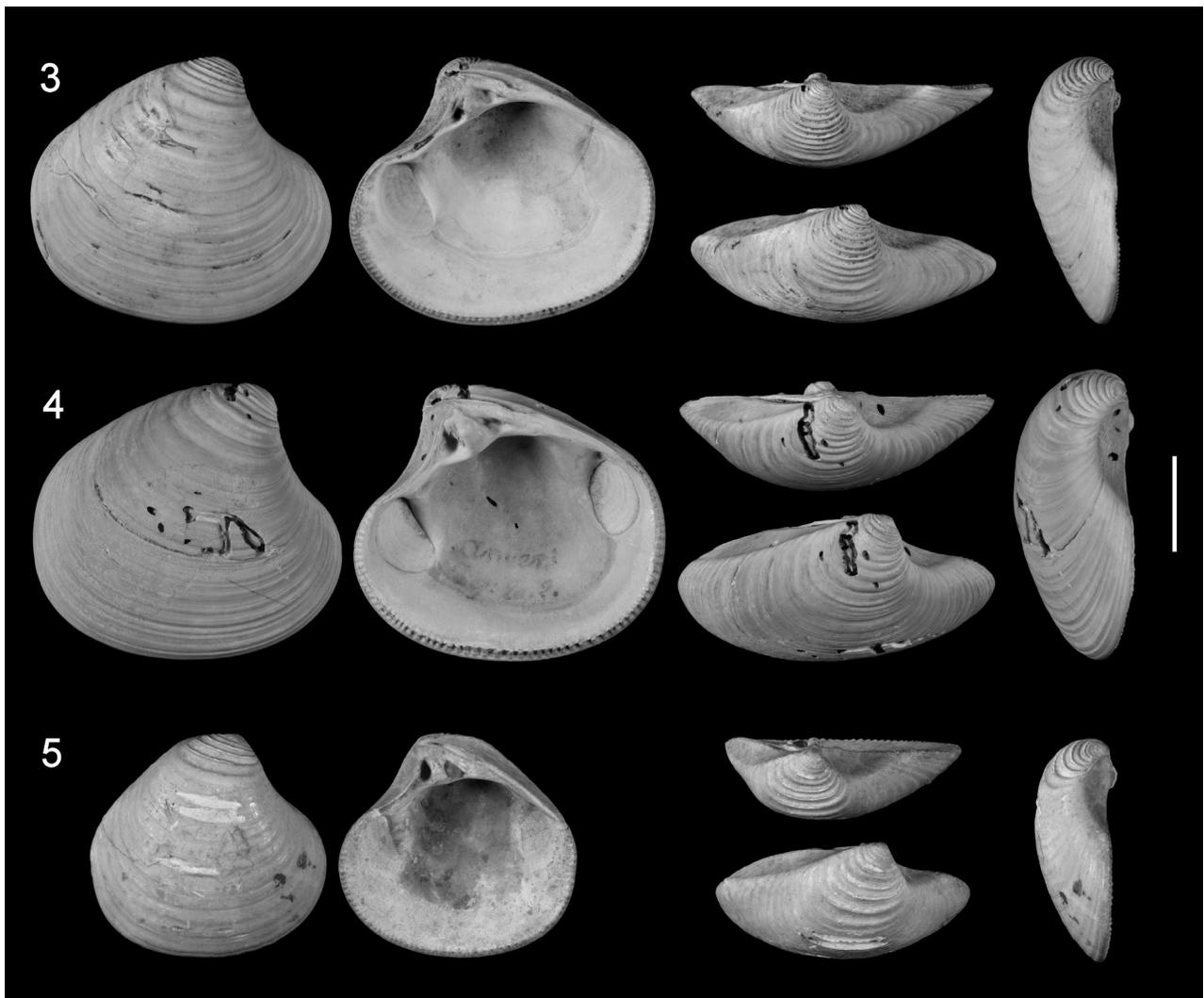
Figure 2. *Astarte omalii*, after de la Jonkaire (1823, fig. 1).

sometimes abruptly truncated, big elongate heart-shaped lunule. The specimens also correspond very well with fig. 1a-c of de la Jonkaire (Figure 2). See Pouwer (2010) for a detailed description of *L. omalii*.

In accordance with Article 75.8 of ICSN (1999), the rediscovered name-bearing syntypes automatically rehabilitate this material as the name-bearing type series and sets aside the neotype designation of specimen RGM.184954 by Pouwer (2010).

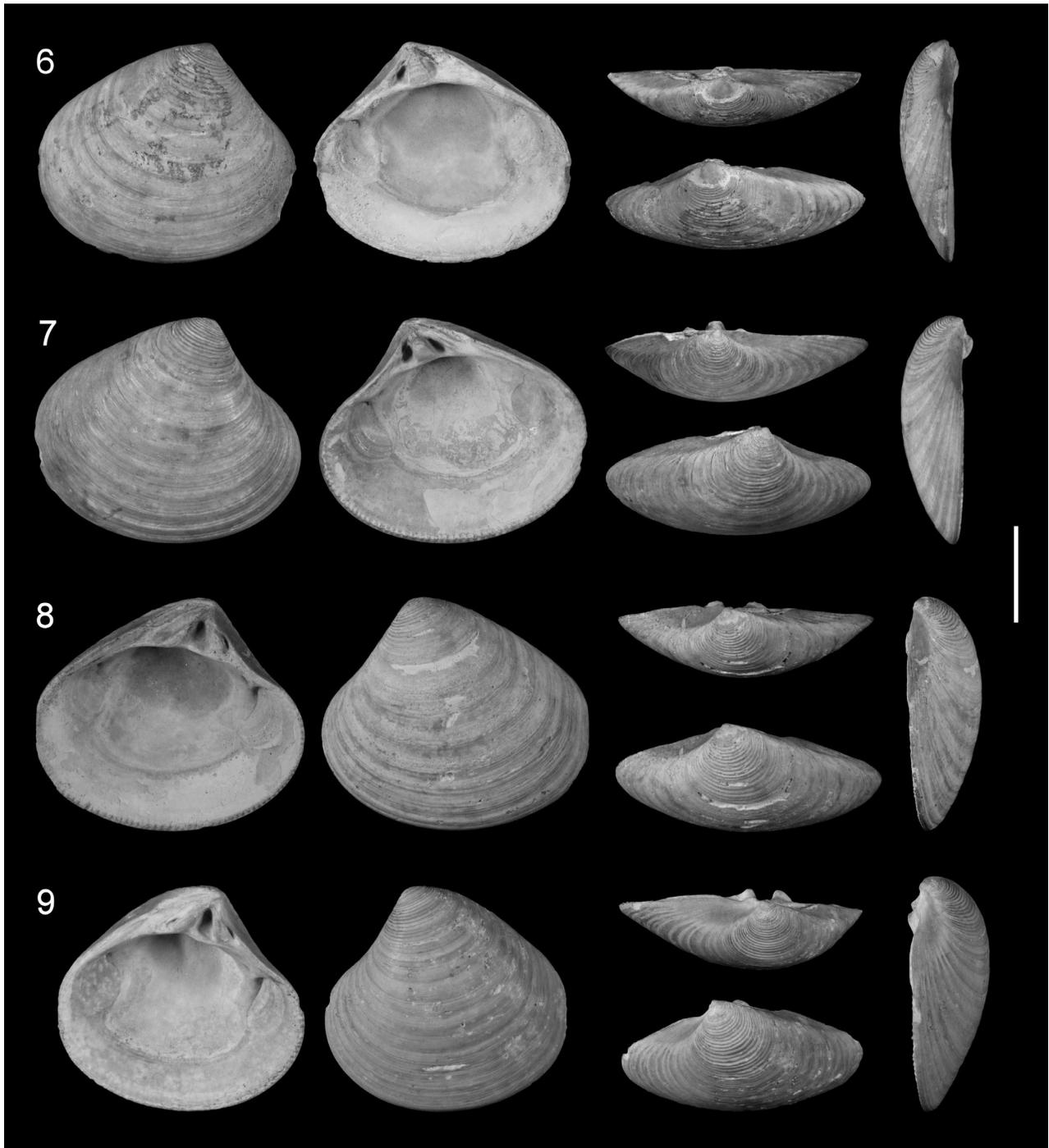
Species	Type status	Catalogue number	Figure
<i>Laevastarte omalii</i> (de la Jonkaire, 1823)	lectotype of <i>A. omalii</i>	MNHN.F.A58629	Fig. 3
<i>Laevastarte omalii</i> (de la Jonkaire, 1823)	paralectotype of <i>A. omalii</i>	MNHN.F.A58736	Fig. 4
<i>Laevastarte bipartita</i> (J.D.C. Sowerby, 1826)	paralectotype of <i>A. omalii</i>	MNHN.F.A58737	Fig. 5
<i>Laevastarte ariejansseni</i> (Marquet, 2005)	4 paralectotypes of <i>A. omalii</i>	MNHN.F.A58738	Figs 6-9

Table 1. Contents of the *Astarte omalii* type series.



Figures 3-4. *Laevastarte omalii* (de la Jonkaire, 1823). 3. Lectotype MNHN.F.A58629 of *Astarte omalii* de la Jonkaire, 1823. 4. Paralectotype MNHN.F.A58736 of *Astarte omalii* de la Jonkaire, 1823.

Figure 5. *Laevastarte bipartita* (J.D.C. Sowerby, 1826), paralectotype MNHN.F.A58737 of *Astarte omalii* de la Jonkaire, 1823. Scale bar = 1 cm.



Figures 6-9. *Laevastarte ariejansseni* (Marquet, 2005), 4 paralectotypes MNHN.F.A58738 of *Astarte omalii* de la Jonkaire, 1823. Scale bar = 1 cm.

We herewith designate the specimen with catalogue number MNHN.F.A58629 as lectotype of *Astarte omalii* de la Jonkaire, 1823 (Figure 3). This very well preserved right valve has a length of 32.5 mm, a height of 28.5 mm and a semidiameter of 8.8 mm. The shell has a small perforation on the umbo, probably caused by an annelid. The right valve with number MNHN.F.A58736 becomes a paralectotype (Figure 4). This shell is also very well preserved, but has several perforations on the central part of the shell and on the umbo.

All other five specimens of the type series also become paralectotypes, although they belong to other species (Article 74.1.3 of ICZN, 1999). One specimen of *Laevastarte ariejansseni* (Figure 6) has a flatter shell than normally seen in that species. However, the characteristic fine sculpture on the umbo and the broad-based ridge bordering the lunule leave no doubt about its identification.

The syntype series of *Astarte basterotii* de la Jonkaire, 1823

There are eleven valves in the syntype series of *Astarte basterotii* de la Jonkaire, 1823. The sample was collected by B. de Basterot at Antwerp (Belgium), as indicated on the original label (Figure 10). The label does not give the figure number in de la Jonkaire’s publication (herein reproduced as Figure 11) but only mentions the journal in which it was published. The type series is composed of three currently recognised species: *Laevastarte basterotii* (de la Jonkaire, 1823), *L. ovatacostata* (Pouwer, 2010)

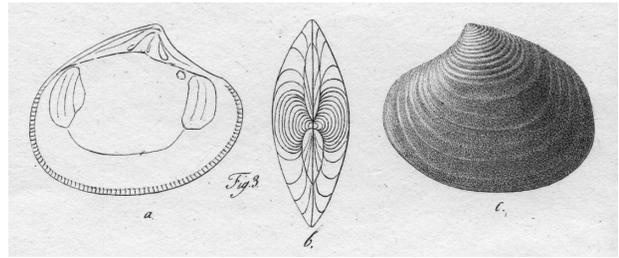


Figure 11. *Astarte basterotii*, after de la Jonkaire (1823, fig. 3).

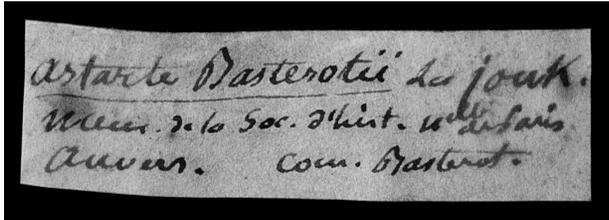
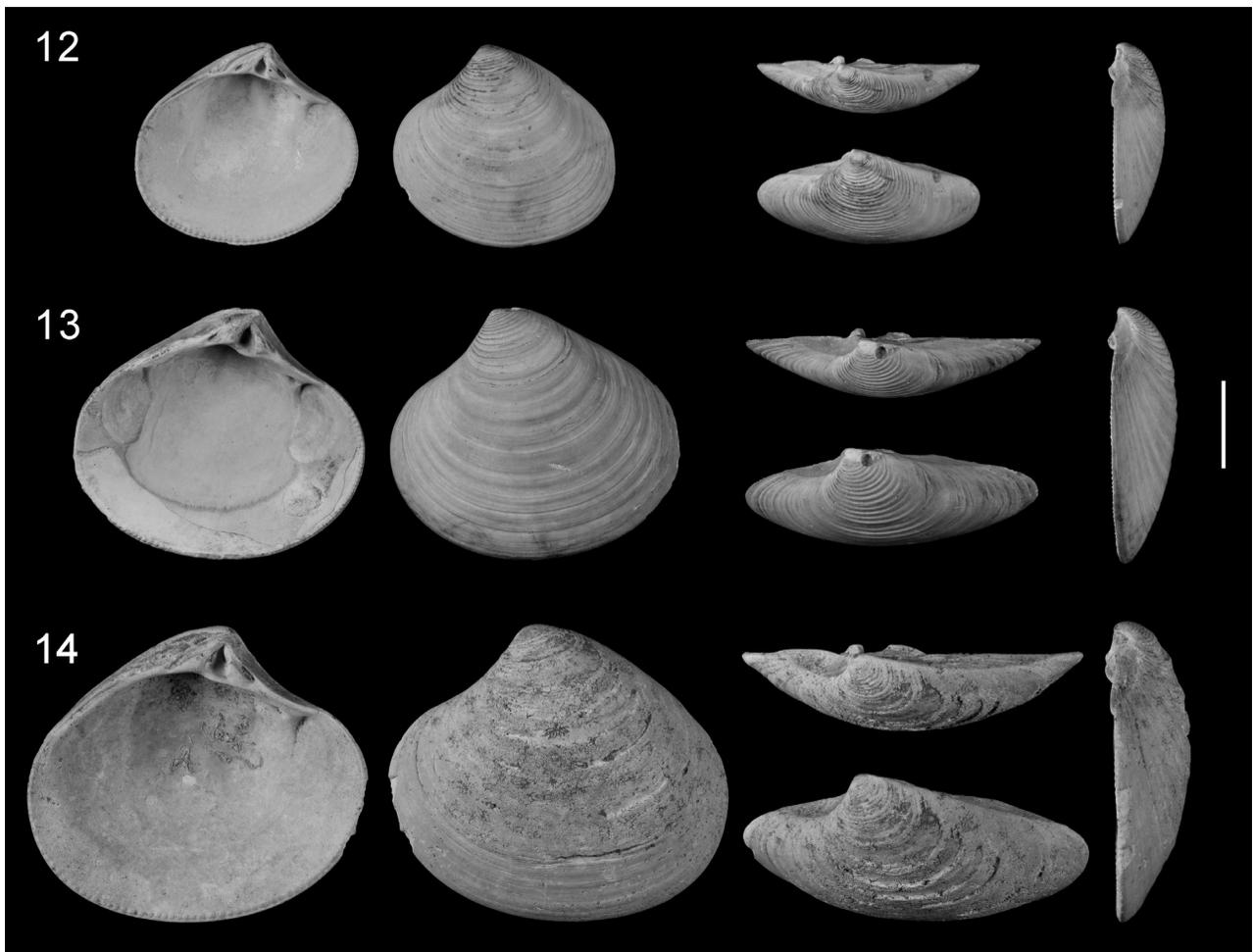


Figure 10. Original label accompanying the syntype series of *Astarte basterotii* de la Jonkaire, 1823.

and *L. ariejansseni* (Marquet, 2005) (Table 2; Figures 12-22). There are only three specimens of *L. basterotii* present in the type series, matching the original description: shell wider and flatter than *L. omalii*, often reaching larger dimensions. The specimens also correspond very well with fig. 3a-c of de la Jonkaire (Figure 11). See Pouwer (2010) for a detailed description of *L. basterotii*. We here point to the fact that the spelling of *basterotii* (with ‘ii’) is correct according to Article 33.4 of ICZN (1999). This contrary to the spelling by most previous authors who frequently used ‘basteroti’.



Figures 12-14. *Laevastarte basterotii* (de la Jonkaire, 1823). **12.** Lectotype MNHN.F.A58630 of *Astarte basterotii* de la Jonkaire, 1823. **13-14.** Two paralectotypes MNHN.F.A58742 of *Astarte basterotii* de la Jonkaire, 1823. Scale bar = 1 cm.

Species	Type status	Catalogue number	Figure
<i>Laevastarte basterotii</i> (de la Jonkaire, 1823)	lectotype of <i>A. basterotii</i>	MNHN.F.A58630	Fig. 12
<i>Laevastarte basterotii</i> (de la Jonkaire, 1823)	2 paralectotypes of <i>A. basterotii</i>	MNHN.F.A58742	Figs 13-14
<i>Laevastarte ovatacostata</i> Pouwer, 2010	2 paralectotypes of <i>A. basterotii</i>	MNHN.F.A58741	Figs 15-16
<i>Laevastarte cf. ovatacostata</i> Pouwer, 2010	paralectotype of <i>A. basterotii</i>	MNHN.F.A58740	Fig. 17
<i>Laevastarte ariejansseni</i> (Marquet, 2005)	paralectotype of <i>A. basterotii</i>	MNHN.F.A58739	Fig. 18
<i>Laevastarte ariejansseni</i> (Marquet, 2005)	4 paralectotypes of <i>A. basterotii</i>	MNHN.F.A58743	Figs 19-22

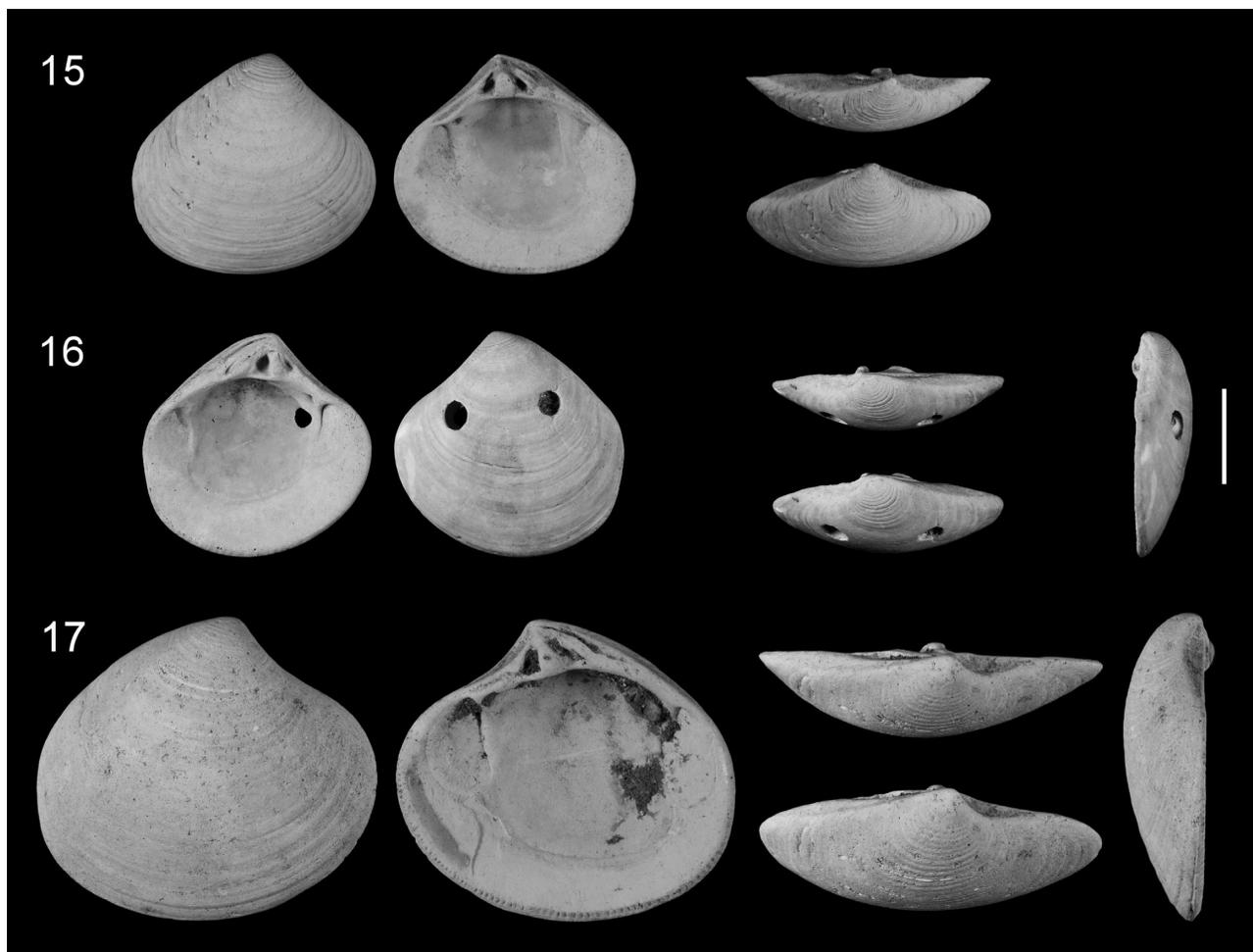
Table 2. Contents of the *Astarte basterotii* type series.

In accordance with Article 75.8 of ICZN (1999), the rediscovered name-bearing type series automatically invalidates the neotype designation of specimen RGM.184950 by Pouwer (2010).

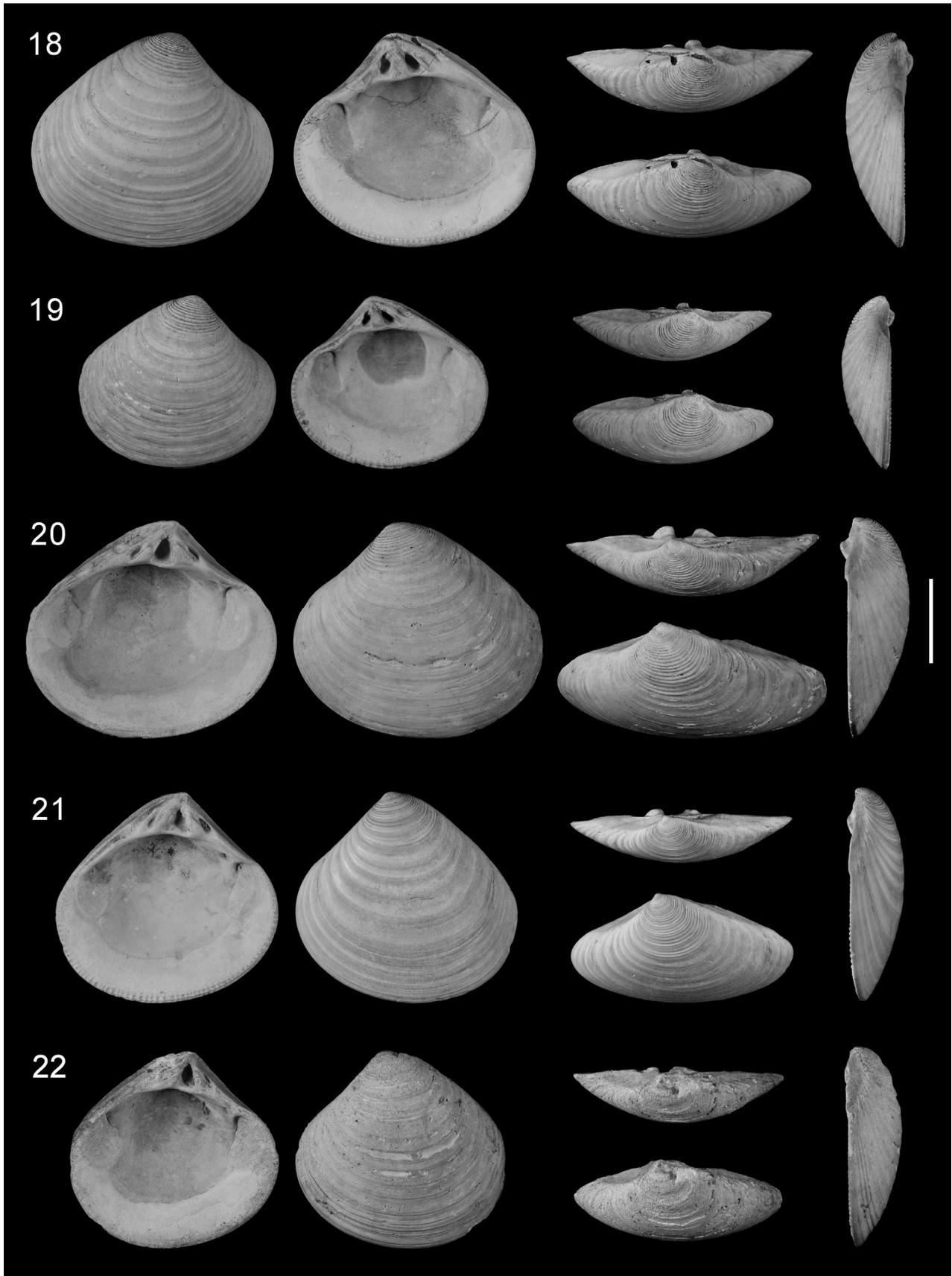
We herewith designate specimen MNHN.F.A58630 lectotype of *Astarte basterotii* de la Jonkaire, 1823 (Figure 12). It is a very well preserved sub-adult left valve with a length of 27.2 mm, a height of 25.0 mm and a semidiameter of 5.5 mm. Among the ten paralectotypes are two further specimens of *L. basterotii* (MNHN.F.A58742)

(Figures 13-14), both of them also left valves. One of them (Figure 13) is very well preserved whereas the other one (Figure 14) has a worn outer surface and a reasonably well preserved interior. The visible sculpture on the umbo, the shape of the shell and lunule are sufficiently characteristic to be certain about the identification of the latter.

Among the remaining eight paralectotypes the ribs of specimen MNHN.F.A58740 (Figure 17) seem to follow a regular oval line without bending posteriorly, as typical



Figures 15-17. *Laevastarte ovatacostata* Pouwer, 2010. **15-16.** Two paralectotypes MNHN.F.A58741 of *Astarte basterotii* de la Jonkaire, 1823. **17.** *Laevastarte cf. ovatacostata* Pouwer, 2010, paralectotype MNHN.F.A58740 of *Astarte basterotii* de la Jonkaire, 1823. Scale bar = 1 cm.



Figures 18-22. *Laevastarte ariejansseni* (Marquet, 2005). **18.** Paralectotype MNHN.F.A58739 of *Astarte basterotii* de la Jonkaire, 1823. **19-22.** Four paralectotypes MNHN.F.A58743 of *Astarte basterotii* de la Jonkaire, 1823. Scale bar = 1 cm.

for *L. ovatacostata*. However, the preservation of the shell is insufficient to be certain about its identification. One specimen of *L. ariejansseni* (sample MNHN.F.A58743, fig. 21) has a flatter shell than normally seen in this species, but other characters clearly point to this species. Another specimen from the same sample (Figure 22) is very poorly preserved. It can be identified as *L. ariejansseni* on the basis of its shape and the broad-based ridge bordering the lunule.

Stratigraphic origin

According to de la Jonkaiere (1823) the stratigraphic origin of both lots discussed above is the '*partie inférieure du calcaire grossier*'. The original labels of the lots give no additional information. In 1823 the stratigraphy of the Neogene deposits near Antwerp was largely unknown (Laga *et al.*, 2006) and at that time the sandy, clayey and calcareous deposits of northern Belgium, the London Basin, the Paris Basin and the northwestern part of Italy were still considered to belong to the same '*formation*' and indicated as '*calcaire grossier*'. De la Jonkaiere expresses his doubts about the correlation between the Paris Basin deposits and the other areas, remarking differences in sediment and molluscan fauna: calcareous with cerithiids in the first, sandy and clayey with astartids in the latter. As we now know these doubts were correct, considering the wide range of deposits present in these basins. But for that moment, without more detailed stratigraphy and correlation possibilities available, de la Jonkaiere still considered the crags of Antwerp to belong to the '*partie inférieure du calcaire grossier*', a term which later in the nineteenth century was restricted to Lutetian (Eocene) deposits in the Paris Basin.

Pouwer (2010), following Marquet (2005), and without realising the aforementioned state of early nineteenth century knowledge, wrote that de la Jonkaiere most likely used the '*partie inférieure du calcaire grossier*' for the lower part of the Pliocene near Antwerp, *viz.* the Kattendijk Formation. This was an incorrect assumption, because all Miocene and Pliocene deposits occurring around Antwerp were included into it.

The stratigraphic origin of each sample could be assumed on the basis of co-occurring species in the samples. But it is unknown if the material was collected at the same site and from the same level. It is even not known if this is the original composition of the two type series. At best the stratigraphic origin is equal to the known stratigraphic range in Belgium of *L. omalii* and *L. basterotii*. The former is very common in the Kattendijk Sand Member (Zanclean; Kattendijk Formation) and the Luchtbal Sand Member (Zanclean; Lillo Formation) while it is scarce

(and reworked) in the basal crag of the Oorderen Sand Member (Piacenzian; Lillo Formation) (Marquet, 2005). *Laevastarte basterotii* is scarce in the upper part of the Kattendijk Sand Member, common in the Luchtbal Sand Member and occurs abundantly in the Oorderen Sand Member (Marquet, 2005).

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