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New *Gari (Psammodonax)* species (Mollusca, Bivalvia) from the Lutetian (Eocene) of Belgium

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Two *Gari* species found in Middle Eocene (Lutetian) deposits from Belgium could not be attributed to any *Gari* species previously described from northwest Europe. Here we describe the species as *Gari wesselinghi* nov. spec and *G. dickmoli* nov. spec.

KEY WORDS: Eocene, Lutetian, Psammobiidae, *Gari, Psammodonax*, Belgium, new species.

Introduction

Lutetian deposits of Belgium have yielded diverse, but often poorly preserved (decalcified) mollusc faunas (Glibert, 1933, 1936; Vervoenen, 1995). Recently, alternative collecting methods have been deployed in such deposits, by collecting whole blocks of sediment and making subsequent preparations from them (Vervoenen, 1995). As a result, tens of fragile species hitherto unknown from the Belgian Eocene have been discovered, which are the subject of ongoing study. Among these were two *Gari* species that we could not match with Eocene species from NW Europe, and that we describe here.

Abbreviations —

FN Collection Freddy van Nieulande, Nieuw en St. Joosland, the Netherlands
MV (former) Collection Marcel Vervoenen, Aalst, Belgium
RGM Collection Geology Department, Naturalis, Leiden, The Netherlands

Systematic Palaeontology

Family Psammobiidae Fleming, 1828
Subfamily Psammobiinae Fleming, 1828
Genus *Gari* Schumacher, 1817
Subgenus *Psammodonax* Cossmann, 1887

***Gari (Psammodonax) dickmoli* spec. nov.**
Fig. 1a-c.

Holotype — RGM 456 478 (ex MV F3197), left valve in matrix. Balegem (Oost Vlaanderen, Belgium), Quarry 'Verlee'. Lede Formation, second shell bed (Vervoenen, 1995), Eocene, middle Lutetian. Leg. M. Vervoenen, 1996.

Diagnosis — Ovate, very small, thin and flat donaciform *Gari* with produced anterior margin; posterior margin rounded, ornamented with circa 25 fine, regularly spaced radial riblets.

Description — The single available shell is thin and flat. The umbo is located at circa one third from the anterior margin. The anterior margin is broadly rounded and grades into the posterior margin; the ventral margin is broadly rounded. The maximum height of the shell is located at about half of the shell length. The posterior margin is rounded and the posterodorsal margin is slightly concave. The posterior flank is lined with circa 25, regularly spaced, fine, rounded, radial riblets that are developed as very low rows of poorly defined tubercles where they cross growth lines. The remainder of the shell is smooth, apart for fine growth lines. The hinge contains two strong, bifid cardinal teeth. Cardinal 1 is large and rather broad, orthocline, and runs along the entire hinge plate. Cardinal 3a is more slender than cardinal 1 and slightly bent backwards. The two teeth make an angle of approximately 50 degrees. Cardinal 3b is obscure and low, possibly as a result of corrosion. A triangular nymph is protruding from the umbo.

Dimensions — H 8.8 mm, L 14.4 mm (holotype).

Differentiation — *Gari (P.) obtusalis* (Deshayes, 1824) from the late Lutetian Wemmel Sands (Glibert, 1936: p. 151) is shorter and higher than *Gari (P.) dickmoli*.

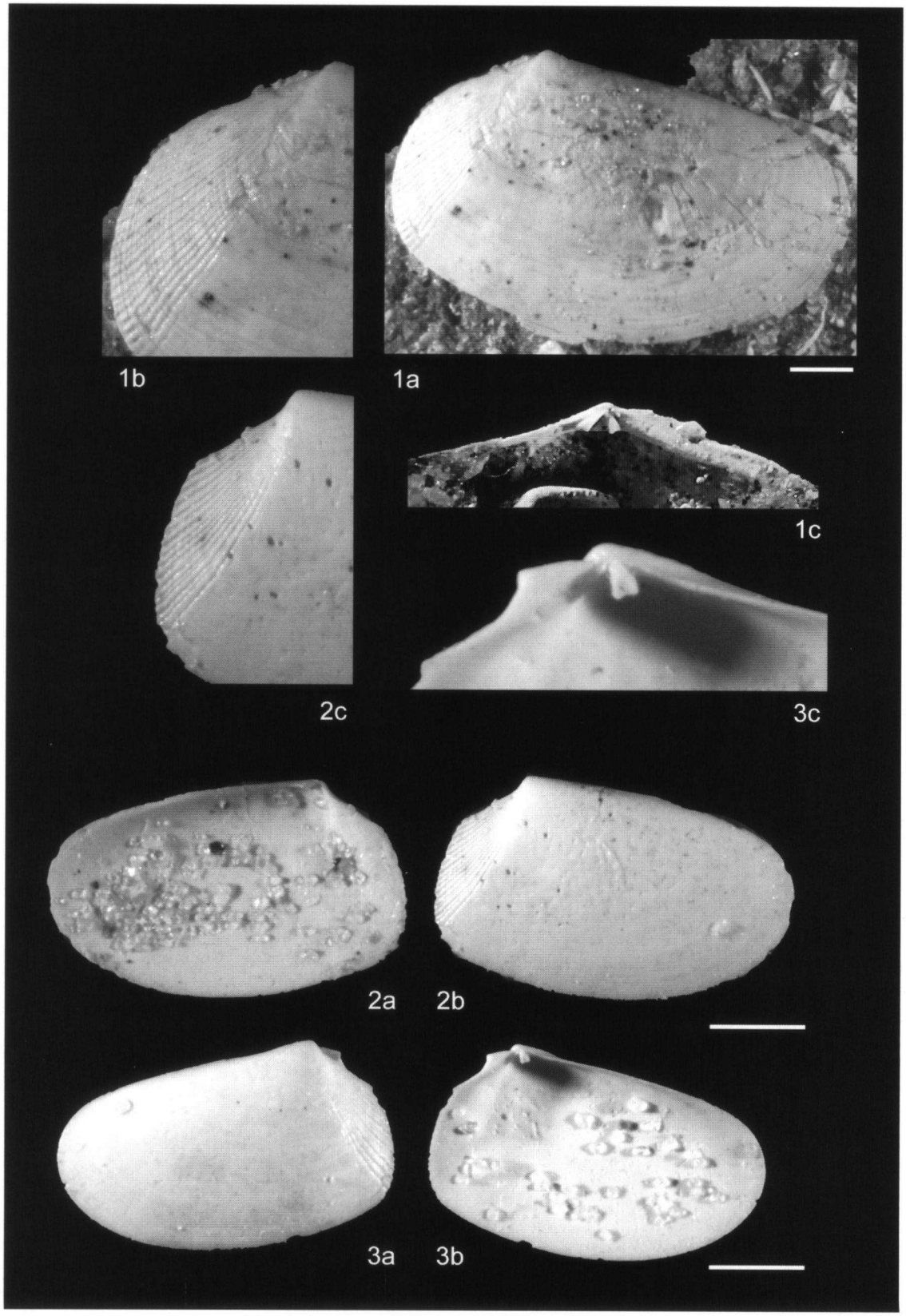

Figure 1, 2 & 3.

Figure 1. *Gari (Psammodonax) dickmoli* spec. nov. RGM 456 478 (left valve, holotype). Balegem (Oost Vlaanderen, Belgium), Quarry 'Verlee'. Lede Formation (Eocene, Lutetian); 1a. exterior view; 1b. detail of anterior margin; 1c. detail of hinge. Scale bar represents 2 mm.

Figures 2-3. *Gari (Psammodonax) wesselinghi* spec. nov.; 2a. RGM 456 479 (left valve, holotype). Berg/Nederokkerzeel (Brabant, Belgium), Quarry 'Imbrechts'. Brussel Formation (Eocene, Lutetian). Interior view; 2b. exterior view; 2c. detail of anterior margin; 3a. RGM 456 480 (right valve, paratype), same locality, exterior view; 3b. interior view; 3c. detail of hinge. Scale bar represents 2 mm.

Gari (P.) vaudini (Deshayes, 1857, from the Cuisian (Ypresian) of the Paris Basin (France), is more tumid, and its posterior slope has larger ribs than *Gari (P.) dickmoli.*

Derivatio nominis — named after Dick Mol, Hoofddorp, The Netherlands, for his admirable worldwide research on Quaternary mammals.

***Gari (Psammodonax) wesselinghi* spec. nov.**
Fig. 2-3.

Type material — Holotype: RGM 456 479 (ex MV F3383), left valve, Berg/Nederokkerzeel (Brabant, Belgium), (abandoned) quarry 'Imbrechts' (Herman *et al.*, 2000). Top Brussel Formation (Eocene, lower Lutetian) from a channel fill. Leg. M. Vervoenen, 1994; Paratypes: RGM 456 480 (ex MV F3383), right valve and RGM 456 481 (ex coll. FN), 2 left valves, 3 right valves, 2 fragments, same locality.

Diagnosis — Small, thin-shelled and flat donaciform *Gari*; anterior margin truncate, lined with circa 18 low and slightly irregularly spaced radial riblets; right valve cardinal tooth bifid; anterior nymph short, erect.

Description — The shell is small and thin. The outline resembles a scalpel blade. The anterodorsal margin is short, concave, and fuses into the very slightly subrounded anterior margin through a rounded angle. The boundary between the anterior and the ventral margin is a narrow bend. The ventral margin is evenly rounded, merging into the rounded posterior margin. The shell reaches its greatest height just behind the middle. The umbo is small. The anterior margin contains circa 18 low and rounded radial riblets that are curved slightly towards the posterior through growth. The width of the riblets and the interspaces is slightly variable within the shells. During growth interspaces grow wider and new ribs develop in-between. The remainder of the shell is, apart for fine growth lines, smooth. The hinge of left valves (LV) is invariably damaged, only showing the elongate, strongly oblique posterior cardinal tooth. In RGM 456 480 (a right valve, (RV)) the hinge is well preserved. The hinge platform is very narrow. A hooked, bifid cardinal tooth 1, that is strongly pointing backwards, dominates the hinge. An obtuse resilifer is located behind. The cardinal 3a is probably broken; cardinal 3b is extremely small, located higher up below the umbo. The RV paratype has fused, rather long cardinals 2a and 2b that bifurcate only near their lower end. Just below the umbo of the RV an obtuse or broken, very short cardinal 4b is present. A short, but prominently upstanding posterior nymph, protrudes from the dorsal margin (figure 3c). The interior of the studied material is corroded, and therefore lacks any trace of the adductor scars and the pallial line.

Dimensions — RGM 456 479 (holotype): H 4.5 mm; L 7.6 mm; RGM 456 480 (paratype): H 4.2 mm, L 6.6 mm.

Differentiation — In general outline and posterior shell sculpture *G. (P.) wesselinghi* resembles *G. (P.) vaudini* (Deshayes, 1857: Ypresian ('Cuisian'), Paris Basin, France), but the former has a flatter shell. The posterior slope of *G. (P.) spathula* (Deshayes, 1857) from the French Lutetien is shorter than that of *G. (P.) wesselinghi.* The posterior slope of the former is more globose (tumid) and is rounded (compared to the flat, rectangular posterior slope of *G. (P.) wesselinghi*). The general shell outline of *G. (P.) donacilla* (Deshayes, 1857) from the Lutetian, France is more elongated and more prominently pointed on the anterior side. *Gari (P.) vaudini* (Deshayes, 1857) from the Ypresian ('Cuisian') of France has a much larger and rounded posterior slope, with larger radial ribs and its posterodorsal margin is straight (it is slightly concave on *G. (P.) wesselinghi). Gari (P.) dickmoli* differs from *Gari (P.) wesselinghi* by the straight posterodorsal margin (nearer the posterior margin in *G. wesselinghi)*, the location of the maximum height of the shell, and the more rounded anterior shell margin. Cardinal 3a on *G. (P.) wesselinghi* is much more slender than cardinal 3a on *G. (P.) dickmoli.* Cardinal 3b on *G. (P.) wesselinghi* is short, but clearly present; but cardinal 3b on *G. (P.) dickmoli* is obscure. *Gari dickmoli* is about twice the size of *G. wesselinghi*, however, the morphological differences (including shape) of subadult growth stages (as reconstructed from growth lines) in *G. dickmoli* are consistently different from those of *G. wesselinghi.*

Derivatio nominis — named after Drs. Frank P. Wesselingh, National Museum of Natural History Museum (Naturalis), Leiden, The Netherlands.

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