

An extension of the geographical and stratigraphical distribution of the European marine bivalve *Montacuta goudi* Van Aartsen, 1997 (Bivalvia, Galeommatoidea, Montacutidae)

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The range of the marine bivalve *Montacuta goudi* Van Aartsen, 1997 (Central Mediterranean to Canary Islands, eastern Atlantic coasts north to Basque coast) is extended with new records from the eastern Mediterranean (Turkey) and Brittany (western France). Also, fossils of this species are reported from Pleistocene, Pliocene and Miocene deposits of the North Sea Basin. The status of this species is discussed and the conclusion is that *M. goudi* is a valid taxon.

Key words: Bivalvia, Heterodonta, Veneroidea, Galeommatoidea, Montacutidae, *Montacuta*, systematics, morphology, distribution, Atlantic, Mediterranean, Recent, Pleistocene, Pliocene, Miocene.

INTRODUCTION

Only 13 years ago Van Aartsen (1997: 27-28) described *Montacuta goudi* Van Aartsen, 1997, a small, fragile, bivalve, at that time already known from a few localities, but apparently restricted to the Lusitanian area. Rueda et al. (2000: 111) reported *M. goudi* from the Straits of Gibraltar and Borja et al. (2001: 79) listed the species from the Basque coast, N Spain.

In 2004 Cachia et al. (2004: 82-83, 208-209) published the first Mediterranean record: they reported the finding of three left valves of this species off Gnejna Bay, Malta. One of these valves has been selected by Mrs T.P. Keukelaar-Van den Berge (Goes, The Netherlands); we studied this specimen and agree with the identification. Three years later Margelli et al. (2007: 96-97) demonstrated beyond doubt the presence of *M. goudi* off Antignano south of Livorno, Italy, in the northern Tyrrhenian Sea. Geuze et al. (2005: 34-35) reported a single valve from La Escala, NE Spain. Peñas et al. (2009: 29, 41-42, 44), describing a malacological fauna from El Maresme, Barcelona, NE Spain, confirmed the presence of *M. goudi* in this area with clear figures. Here we present further records of the species extending its range, geographically as well as stratigraphically.

The abbreviations DFH and ACJ are used for the authors.

NEW GEOGRAPHICAL RECORDS

Dr J.J. van Aartsen (Dieren, The Netherlands) wrote to us (in litt., 2008) that he had found *M. goudi* near Mersin, S Turkey. Thus the species also lives in the eastern Mediterranean Sea.

The Basque coast has been so far the northernmost limit

of the known distribution of the species. However, on 2.viii.2007 DFH took a sample of shell grit from the Porzic beach near Morgat, Crozon peninsula, Finistère dept., W France. Four fresh valves of *M. goudi* were found in that sample, extending its distribution northwards: 1 left and 1 right valve (in colln Mrs T.P. Keukelaar-Van den Berge), 1 left and 1 right valve (in colln DFH) (max. H 1.8 mm, max. L 2.6 mm). In addition Mr W. Segers (Aartselaar, Belgium) showed us a sample containing 4 left and 8 right fresh valves of *M. goudi* (max. H 1.8 mm, max. L 2.4 mm) collected at La Grande Plage, Penthièvre, Quiberon peninsula, Morbihan dept., W France in iv.1997.

Thus *M. goudi* is now known from localities in the entire Mediterranean Sea and along the eastern coasts of the Atlantic Ocean, from the Canary Islands in the south to western France in the north.

NEW FOSSIL RECORDS

More than 200 valves of *M. goudi* (Figs 1-2; max. H 3.6 mm, max. L 4.8 mm) were found by ACJ in samples from borehole Zuurland-2 near Brielle (Zuid-Holland prov., The Netherlands) executed by Mr L.W. Hordijk in 1988 (Janse, 2007, 2008). The valves derive from an interval between 101 and 107 meters below surface from the upper part of Gelasian (Early Pleistocene), Maassluis Formation.

A fossil fragment of *M. goudi* from Late Zanclean to Early Piacenzian Luchtbal Member (Pliocene), Lillo Formation from the Antwerp area, Belgium, was found by Mr P.W. Moerdijk (Middelburg, The Netherlands). It concerns the posterior half of a right valve (H 3.0 mm) found in excavation works of the Deurganckdok near Doel (Antwerpen prov., Belgium) on 13.xi.2000.

Finally, a Middle Miocene species reported by Janssen (1984: 70-71, pl. 4 figs 11-12; our Figs 3-4) from Miste (Gelderland prov., The Netherlands) as '*Tellimya* sp.1' also turned out to be indistinguishable from *M. goudi*. The species was found in Burdigalian Miste Bed, Breda Formation. Study of the material on which Janssen based his description (6 valves, max. L 3.2 mm; samples RGM 225.433 and 225.434 in the collections of the Netherlands Centre for Biodiversity Naturalis, Leiden, The Netherlands) confirmed

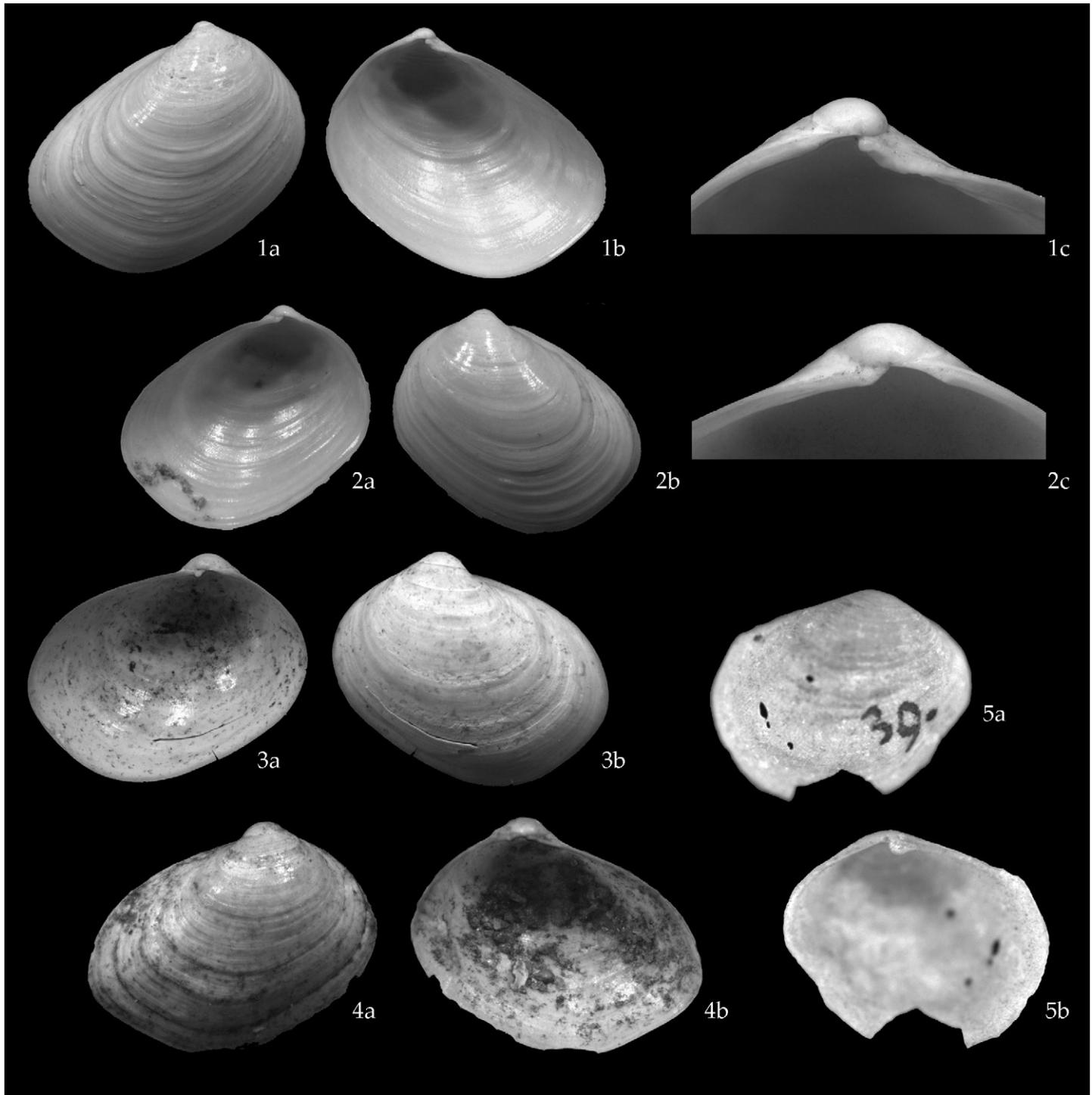
the attribution to *M. goudi*. The umbones and prodissoconchs of the Miste specimens are somewhat larger than those of typical *M. goudi* (compare Figs 3-4 with figs 1-2 of Van Aartsen, 1997: 28), but we consider these small differences insignificant. Janssen's record extends the stratigraphical range of *M. goudi* to about 16 Ma.

MORPHOLOGY

The shell of *M. goudi* is fragile, swollen, equivalve and very inequilateral. The outline of the valves varies from rounded rectangular to oval, with more or less convex margins. The valves are glassy transparent to whitish opaque, somewhat glossy on the inside and the outside. The umbones are prosogyrate and situated at the posterior part of the valves. The prodissoconch is smooth and clearly circumscribed; the dissoconch is sculptured with concentric lines and ridges. At the inside a small resilifer is situated below and behind each beak. There is a small tooth-like tubercle anterior to the resilifer in both valves (Figs 1c, 2c). The Pleistocene adult shells from Brielle (Figs 1-2) are relatively large (max H 3.6 mm, max L 4.8 mm) compared with Recent adults (max H 2.5 mm and max L 3.5 mm according to Van Aartsen, 1997: 28).

Van Aartsen's (1997: 27) statement "the valves are of a subcylindrical form when young and more oval when full-grown" does not hold (compare figs 1-2, fig. 3 k-l of

Figs 1-4. *Montacuta goudi* Van Aartsen, 1997. **1-2**, Borehole Zuurland-2, from 102-103 m b.s., Gelasian (Maassluis Formation), Brielle, Zuid-Holland prov., The Netherlands; (RGM 607.306 [fig. 1] and 607.307 [fig. 2], colln NCB Naturalis, Leiden, The Netherlands; L.W. Hordijk leg., 1988). **1**, left valve, H 3.6 mm, L 4.8 mm; **2**, right valve, H 3.5 mm, L 4.4 mm. **3-4**, Burdigalian (Miste Bed, Breda Formation), Miste, Gelderland prov., The Netherlands (RGM 225.434 [fig. 3] and 225.433 [fig. 4], colln NCB Naturalis, Leiden, The Netherlands). **3**, right valve, H 2.5 mm, L 3.0 mm (Janssen, 1984: pl. 4 fig. 12); **4**, left valve, H 2.6 mm, L 3.2 mm (Janssen, 1984: pl. 4 fig. 11). Photographs by Dr. Frank Wesselingh. **Fig. 5**. *Anatina ? pusilla* Philippi, 1836. Tertiary deposits, Palermo, Sicily, Italy (MB.M.6242, Paleontological dept., Museum für Naturkunde der Humboldt-Universität, Berlin, Germany); left valve, lower margin severely damaged, L 8.8 mm. Photographs by Dr Peter Barry.



Margelli et al., 2007: 96 and figs 54-57 of Peñas et al., 2009: 41). Previously, elongate specimens have been misidentified as *Devonia perrieri* (Malard, 1904), e.g. by Rolan Mosquera et al. (1990: 130). *Devonia perrieri* differs from *M. goudi* in being not swollen, in having smaller umbones, in being edentulous and in having a more or less concave anterior upper margin (Van Aartsen, 1997: 29; Tebble, 1976: 82, 88-89).

SYSTEMATICS

The formal description of *Montacuta goudi* was published in 1997 (La Conchiglia 28: 2-3) and not in 1996 as is incorrectly recorded in the Check List of European Marine Mollusca (clemam) <http://www.somali.asso.fr/clemam/index.clemam.html>, consulted by the authors in May 2010.

The shells of *M. goudi* show a great variability. Van Aartsen (1997: 28) already noted the resemblance with *Kellia cycladea* Sowerby, 1844 (illustrated with only the name by Sowerby, 1844: pl. 637 fig. 6; described in 1846: 63-64) (publication data according to Cleavelly, 1974). *Kellia cycladea* is synonymous with *K. cycladia* Wood, 1851 (published as a nomen nudum by Wood, 1840: 247; compare Sowerby, 1844, 1846, and Wood, 1851: 122-123, pl. 11 fig. 4). For unknown reasons, Sowerby and Wood consistently used different spellings, although they knew their mutual publications (compare Sowerby, 1846: 63 and Wood, 1851: 122). Dr Martin Munt kindly tried to trace type material of these taxa in the Wood and Sowerby collections in the Natural History Museum, London, but no specimens could be found.

In his Addendum, Wood (1874: 189; addendum plate fig. 25) introduced another species resembling *M. goudi*, namely *Scacchia lata* Wood, 1874. However, Wood's (1874) figure 25 shows a right valve of *S. lata* with a relatively strongly developed hinge plate, a feature unknown in *M. goudi*. Material of *S. lata* could also not be located by Dr Munt.

We also asked Dr Tony Irwin from the Norwich Castle Museum at Norfolk, Great Britain, to check their type material of Sowerby and Wood, but the taxa we were looking for could not be found. Most likely the type material of *K. cycladea*, *K. cycladia* and *S. lata* must be considered lost, so that it is impossible to establish the identity of these taxa.

In his first Supplement to the Crag Mollusca Wood (1874: 124) suggested that *Scacchia cycladia*, in 1851 described by him as *Kellia cycladia*, may possibly be conspecific with *Anatina ? pusilla* Philippi, 1836 [question mark by Philippi] from the Neogene, Sicily, Italy. Drs Peter Barry and Thomas von Rintelen kindly sent us pictures of a left valve (Fig. 5; type specimen?) of *A. pusilla* from the paleontological department of the Museum für Naturkunde der Humboldt-Universität, Berlin, Germany. At the outer surface the valve shows the number "39."; according to Dr Barry the box is labelled "MB.M.6242". The striking similarity of this picture and Philippi's description and figure (Philippi, 1836: 9; tab. 2 fig. 5; Philippi, 1844: 7), considering the strong cardinal tooth and the extended lower margin, makes clear that *A. pusilla* and *M. goudi* refer to different species.

Our investigations thus make us conclude that *Montacuta goudi* is a valid taxon.

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BOOK REVIEW

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HELLER, J., 2009: Land snails of the Land of Israel. Natural history and a field guide: 1-360, 198 figures, many colour drawings. ISBN 978-954-642-510-2 (HB), ISBN 978-954-642-511-9 (e-book). Published by: Pensoft Publishers, Geo Milev Str. 13a, Sofia 1111, Bulgaria; www.pensoft.net; hardcover, € 70.

This book on the land snails of the Land of Israel consists of two parts, with the first part covering aspects of the natural history of land snails, and a second part being a field guide to the molluscan biodiversity of Israel. Parts of this book are based on an earlier version in Hebrew. Next to a general introduction to land snails, the natural history section is subdivided in chapters dealing with the shell, the body, activity patterns, resistance to desiccation and heat, predation, defence strategies, biogeographical aspects, and confrontations with man. Two supplements give information on the freshwater snails of the region and their biogeography, and finally a short sketch on the history of land snail research and an extensive list of references complete the first section. In the second part, the field guide lists all the species of recent land snails considered as being native to region. Each species is characterised by a short description, a colour drawing and a map illustrating its distribution.

It has to be noted that this book is unique, as there is no modern comprehensive work of such a high scientific standard available for the area. In the natural history section, the author finds quite a successful balance between introducing laymen to general characteristics and habits of land snails

and focussing to the special ecological requirements of snails living under steppe- to desert-like conditions. The first chapters contain information on gastropod taxonomy, shell morphology, life styles and similar topics, but even here, the direct relationship to the area is always stressed. Exemplary are the chapters on activity and resistance to desiccation, where the autecology of particular species is summarised displaying the adaptation strategies used by snails to withstand uncomfortable environmental conditions. The chapters on freshwater snails (quite unusual in a book on land snails) represent a beneficial trip owing to the author's proper field of investigation, the freshwater fauna of the Middle East. The final chapter on the history of land snail research is thought to serve readers not really acquainted with malacology in general and remains at the surface; for those with a deeper interest in this subject, other sources are certainly more relevant.

Last but not least, the field guide is more a kind of appendix if compared to the attentive style in the first part. Recalling the complicated nomenclatural history of dozens of the species treated, presentation of more nomenclatural details would certainly have raised the quality of this section. The species-level taxonomy may be debatable in several cases, but the relativeness of the system presented is only seldom mentioned as for example in the question whether *Oxychilus camelinus* and *Oxychilus renanianus* in fact represent two distinct species! In the current shape, the field guide suggests a stability of taxonomy which clearly is not yet reached in the Eastmediterranean region.

Concluding it can be said that this book is a must for all students of malacology in the area, but also for those who want to learn about the fascinating adaptation strategies of land snails in an arid environment. It should also be read as a plea for more effective conservation efforts in an area, which will be considerably affected by the global Climate Change. It is hoped that this book will not soon be an illustration of a past malacobiobiodiversity.