

**BARBATIA (*CUCULLAEARCA*) VINCENTI (COUFFON, 1905), CORRECT
NAME FOR THE SO-CALLED 'BARBATIA BOHEMICA' FROM THE
MIOCENE OF FRANCE**

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It is pointed out that the name *Barbatia (Cucullaearca) vincenti* (Couffon, 1905) should be used for the Miocene bivalve species from western France generally referred to as *Barbatia bohemica* (Reuss, 1860). *Arca bohemica* Reuss, 1860 is considered to be a junior synonym of *Acar clathrata* (Defrance, 1816).

Key words — Mollusca, Bivalvia, Arcidae, Miocene, Paratethys, France, taxonomy.

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INTRODUCTION

The Miocene deposits of the Loire Basin (western France) are characterised by the occurrence of highly fossiliferous crags, usually referred to as 'faluns de Touraine'. Two large-sized species of the arcid bivalve genus *Barbatia* Gray, 1842 are commonly found in these crags, one of them being the well-known species, *B. barbata* (Linné, 1758). The second species, recorded also from the Aquitaine Basin (Cossmann & Peyrot, 1912) and from deposits of Redonian age in Brittany and Normandy (Lauriat-Rage, 1981), is commonly referred to as *Bar-*

batia bohemica (Reuss, 1860) (see e.g. Dollfus & Dautzenberg, 1913).

Barbatia bohemica was first described from Miocene deposits in the central Paratethys; Studencka (1986, p. 19, pl. 3, fig. 1a-b) recorded it from the Miocene of Poland, noted the marked differences in size between Paratethyan specimens and those from France, and assigned her material to *Barbatia (Acar)*, a conclusion we concur with, judging from the illustration she provided. French specimens, however, have generally been placed in *Barbatia (Cucullaearca)* (see Glibert & van de Poel, 1965; Lauriat-Rage, 1981). It was this discrepancy that incited us to have a closer look into the previous use of the name *Barbatia bohemica*. The conclusion we reached is that this name should not be used for the French populations, as will be discussed below.

TAXONOMY

The first record of the French species of *Barbatia* discussed here is that of Deshayes (1829, p. 210, pl. 33), who described *Arca rudis* from the Eocene of the Paris Basin, and mentioned the following localities:

'Valmondois, G.M.S. faluns de la Touraine, Angers, Valognes'. Deshayes noted the fact that this was a long-ranging species, as follows, 'L'Arche rude est fort remarquable non-seulement par sa taille, qui la place au rang des plus grandes espèces du genre, mais encore par la manière dont elle est répandue dans diverses localités. Les analogies entre les espèces des différens bassins sont fort rares, surtout entre celles du bassin de Paris et de bassins plus modernes. Comme nous n'ignorons pas que ces analogies sont fort importantes quant au résultat géologique que l'on peut en tirer, ce n'est qu'après un examen très-scrupuleux que nous les admettons.'

From this citation it is obvious that Deshayes was quite astonished to find this species occurring in Eocene as well as in Miocene deposits, which indeed is a rare phenomenon. Still, Deshayes had examined his material 'très-scrupuleux'. In a paper describing fossils from Touraine Dujardin (1835, p. 266) also accepted *A. rudis* to be a long-ranging species. Subsequent authors, however, denied the conspecificity of the Eocene and Miocene material (Sandberger, 1863; Cossmann, 1887, 1892; see below).

Later, Nyst (1848, pp. 64, 65) assumed the name *Arca rudis* Deshayes, 1829 to be preoccupied by what he referred to as *Arca (Cucullaea) rudis* [= *Cucullaea rudis* J. de C. Sowerby, 1824 (p. 68, from the Jurassic 'limestone at Ancliff'); now referred to the genus *Parallellodon* Meek & Worthen, 1866] and therefore suggested the name *Arca scabrosa* to substitute *Arca rudis* Deshayes non J. de C. Sowerby. Nyst recorded the same localities for this species as did Deshayes and in doing so accepted its long range.

D'Orbigny (1850, p. 424) also noted the preoccupation of the name *Arca rudis* and, apparently unaware of Nyst's (1848) paper, substituted the name *Arca rudis* by *Arca subrudis*.

Deshayes (1860, p. 874), however, maintained the genera *Arca* Linné, 1758 and *Cucullaea* Lamarck, 1801, and thus rejected the names *Arca scabrosa* Nyst, 1848 and *Arca subrudis* d'Orbigny, 1850, as in his opinion there was no case of preoccupation.

Sandberger (1863, pp. 352, 353) denied the conspecificity of Eocene and Miocene populations, pointing out differences in surface ornament. He maintained Deshayes's name *A. rudis* and introduced a variety for his Oligocene material, *A. (Barbatia) rudis* var. *postera*. Although he referred to Miocene material from 'Cabannes' (= St. Paul-lès-Dax, Aquitaine Basin) he did not put a name to those specimens.

Mayer (1868, p. 80), however, considered *Arca rudis* Deshayes and *Cucullaea rudis* J. de C. Sowerby to be homonyms, and therefore accepted the name *A. scabrosa* Nyst for Eocene as well as Miocene specimens.

Oddly enough, Cossmann (1887, p. 127) accepted the name *A. subrudis* d'Orbigny for the Eocene species, considering Miocene forms to represent a separate taxon, but without naming it. Nyst's paper must have been known to him, since it was mentioned in Mayer's work, which d'Orbigny referred to !

Vincent (1889, pp. clxvii, clxviii) discussed these taxonomic problems and pointed out that the name *Arca scabrosa* Nyst had been introduced as a substitute name for the Eocene species. Subsequently, Cossmann (1892, p. 39) considered the Miocene Touraine species to differ from the Eocene taxon of the Paris Basin and proposed the new name *Arca Vincenti* for the former. Unfortunately, he did not describe nor give an illustration of this species, nor did he refer to a previous description. The name *vincenti*, chosen in recognition of É. Vincent, is thus a nomen nudum.

The name *Arca (Acar) Vincenti* Cossmann, 1892 was accepted by Dollfus & Dautzenberg (1901, p. 264), who did not describe it either, but who stated that in their opinion *A. bohémica*, originally recorded from the Miocene of Bohemia, is but a smaller variety of *A. vincenti*. They did not, however, conclude that, if so, *A. bohémica* Reuss, 1860 had priority over *A. vincenti* Cossmann, 1892.

Couffon (1905, p. 175, pl. 1, fig. 8) provided the first description and illustration of the Miocene species. His illustration depicts a distinctly recognisable specimen, but the magnification factor ('grossie 3 fois') appears to be incorrect. Couffon referred to this species as *Arca (Acar) Vincenti*. In view of the fact that Cossmann's name is invalid, Couffon is to be considered the author of this taxon.

The observations of Dollfus & Dautzenberg (1901) made Dollfus (1909, p. 373, pl. 3, fig. 5) conclude that the large species from the Miocene of the Aquitaine and Touraine should be indicated as *Arca bohémica* Reuss, 1860. The name *bohémica* was used by all subsequent authors, who, however, assigned the species to different genera, e.g.

Dollfus & Dautzenberg (1913)	<i>Arca (Acar) bohémica</i>
Cossmann & Peyrot (1912)	<i>Barbatia bohémica</i>
Glibert & van de Poel (1965)	<i>Barbatia (Cucullaearca) bohémica</i>
Saint Martin (1975)	<i>Acar (acar) [sic] bohémica</i>
Lauriat-Rage (1981)	<i>Barbatia (Cucullaearca) bohémica</i>

CONCLUSIONS

From the above account it is clear that the correct name for the Eocene species of the Paris Basin is *Arca rudis* Deshayes, 1824, at present assigned to the subgenus *Cucullaearca* Conrad, 1865 (type species: *Bysoarca lima* Conrad, 1847) of the genus *Barbatia*. The names *Arca scabrosa* Nyst, 1848 and *Arca subrudis* d'Orbigny, 1850 are junior synonyms.

For the Touraine material two names have previously been used, viz. *Arca bohémica* Reuss, 1860 and *Arca vincenti* Couffon, 1905. Whether or not these names are synonymous is discussed below.

STATUS OF *Arca bohémica* REUSS, 1860

Material from various French localities was available for study, and in order to decide whether or not the two taxa mentioned above are synonymous, we examined the type material of *Arca bohémica* Reuss, 1860, housed in the collection of the Naturhistorisches Museum at Vienna (Austria). Through the courtesy of Dr O. Schultz we were able to study the type lot of *bohémica*, consisting of a single, complete left valve and a fragment from Rudelsdorf in Bohemia (Czechoslovakia).

This left valve is designated lectotype herein, and illustrated in Pl. 1, Fig. 1a-c. Evidently, this is the same specimen Reuss (1860, pl. 3, fig. 13a-d) illustrated. On account of its outline, the elevated adductor scars, the presence of a marked posterior ridge and a regular surface sculpture, consisting of relatively coarse radial and concentric elements, this species is placed in the genus *Acar* Gray, 1857 (type species: *A. gradata* Broderip & Sowerby, 1829).

Acar bohémica closely resembles *A. clathrata* (Defrance, 1816), the typical form of which has a different sculpture and a more elongate outline (see Pl. 1, Fig. 5a-c). *A. clathrata* was first described (Defrance, 1816) from the Miocene of St Clément-de-la-Place, Anjou (France). It is widely distributed throughout Europe, being recorded also from various Paratethys localities (e.g. Reuss, 1860; Hoernes, 1870; Kautsky, 1932; Friedberg, 1936; Studencka, 1986). *A. bohémica*, however, was recorded from the Paratethys only by Reuss (1860), Kautsky (1932) and Studencka (1986). We are of the opinion that, in view of the well-known wide range of variation of many Arcidae and especially of *Acar* (see e.g. Rost, 1955, p. 188), *A. clathrata* and *A. bohémica* are conspecific, *bohémica* Reuss, 1860 being a junior synonym of *clathrata* Defrance, 1816.

Having reached this conclusion it is interesting to note that Reuss (1860, p. 240) recorded exclusively small specimens of *A. clathrata* from the type locality of *A. bohémica*, Rudelsdorf. Apparently he thought the larger specimens to represent a separate species.

Acar clathrata AND *Arca vincenti* COMPARED

Unfortunately the type material of *A. vincenti* was not available for study. Our observations are based on specimens from various localities in the Loire Basin Miocene (Touraine). These individuals differ from *A. clathrata* s. lat. in being much larger (more than twice the length in adults), in having a considerably higher ligamental area with a well-developed set of V-shaped grooves (in adults), non-thickened adductor scars and a weaker posterior ridge, which, however, commonly has relatively strong spines.

This combination of features does not agree with the genus *Acar*, but corresponds very well with *Cucullaearca* (compare Reinhart, 1935, p. 27). The correct name for *Arca vincenti* would therefore be *Barbatia (Cucullaearca) vincenti* (Couffon, 1905). Some well-preserved specimens from Paulmy (Touraine) are illustrated here in Pl. 1, Figs 3-4.

From a comparison with the Eocene *B. (C.) rudis* (see Pl. 1, Fig. 2), it must indeed be concluded that the two are closely related and certainly are members of the same lineage. Still, the Eocene form has a coarser radial sculpture, the ribs being more widely spaced, which results in heavier knobs on the ribs. Sandberger (1863) was right when he observed differences in the radial sculpture behind the posterior ridge (3 ribs in *rudis*, 4-5 ribs in *vincenti*). The Oligocene form, described by him as *A. rudis* var. *postera* seems to be intermediate in various respects, thus completing the lineage.

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REFERENCES

- Cossmann, M., 1887. Catalogue illustré des coquilles fossiles de l'Éocène des environs de Paris, 2. — Annales de la Société royale Malacologique de Belgique, 22: 1-214, 3 pls.

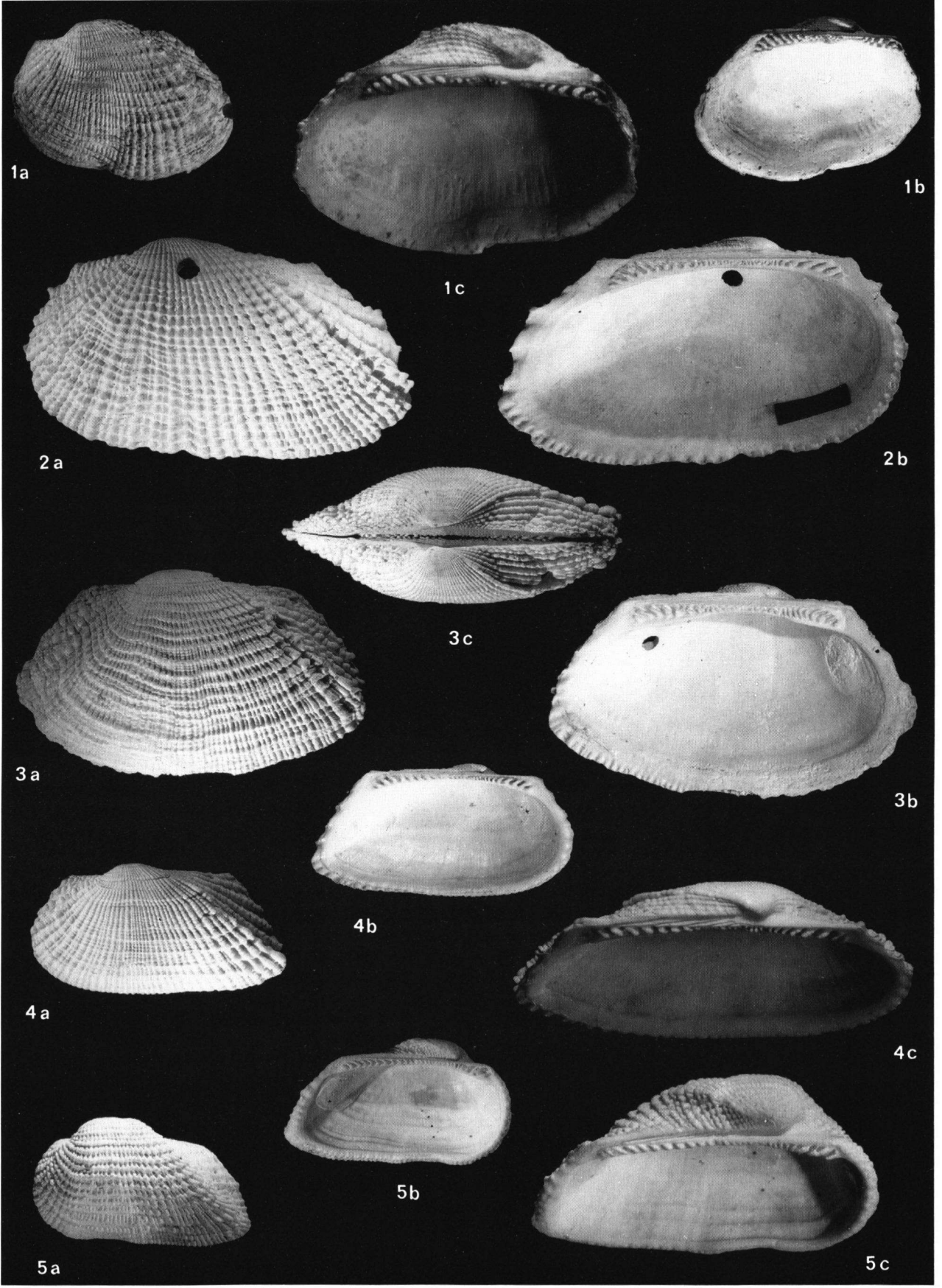
- Cossmann, M., 1892. Catalogue illustré des coquilles fossiles de l'Éocène des environs de Paris, cinquième fascicule et supplément. — Annales de la Société royale Malacologique de Belgique, 26: 1-263, 3 pls.
- Cossmann, M., & A. Peyrot, 1912. Conchologie néogénique de l'Aquitaine, 2. — Actes de la Société linnéenne de Bordeaux, 66(2): 121-168; (3): 168-232; (4): 233-324, pls 1-10.
- Couffon, O., 1905. Étude critique sur les faluns de Chalonnnes (gisement des Pierres-Blanches). — Bulletin de la Société d'Études scientifiques d'Angers, 34: 135-222, 1 pl.
- Defrance, M., 1816. Arche (Foss.). — Dictionnaire des Sciences naturelles, 2 (suppl.). Strasbourg/Paris (Levrault, Le Normant), pp. 113-116.
- Deshayes, G.P., 1824-1837. Description des coquilles fossiles des environs de Paris, 1. Conchifères. Paris (L'auteur, Béchot Jeune, Baudouin Frères, Treuttel & Wurtz), pp. 1-80 (1824); 81-170 (1825); 171-238 (1829); 239-322 (1830); 324-392 (1832); atlas, 28 pp., 65 pls (1837).
- Deshayes, G.P., 1856-1860. Description des animaux sans vertèbres découverts dans le Bassin de Paris, pour servir de supplément à la description des coquilles des environs de Paris, comprenant une revue générale de toutes les espèces actuellement connues, 1. Mollusques acéphales dimyaires. Paris (Baillièrre), 912 pp., 89 pls (atlas).
- Dollfus, G.F., 1909. Étude critique sur quelques coquilles fossiles du Bordelais. — Actes de la Société linnéenne de Bordeaux, 62: 355-380, 5 pls.
- Dollfus, G.F., & P. Dautzenberg, 1901. Nouvelle liste des pélecypodes et des brachiopodes fossiles du Miocène moyen du Nord-Ouest de la France. — Journal de Conchyliologie, 49: 229-280.
- Dollfus, G.F., & P. Dautzenberg, 1913. Conchyliologie du Miocène moyen du Bassin de la Loire, 1(5). — Mémoires de la Société géologique de France, Paléontologie, 27: 297-378, pls 23-33.
- Dujardin, F., 1835. Mémoire sur les couches du sol en Touraine et descriptions des coquilles de la craye et des faluns. — Mémoires de la Société géologique de France, (1)9(2)1: 211-311, pls 15-20 (A-F).
- Friedberg, W., 1934-1936. Mieczaki miocenskie ziem Polskich (Mollusca miocaenica Poloniae), 2. Malze (Lamellibranchiata). Kraków (Polskie Towarzystwo Geologiczne), pp. 1-158, pls 1-24 (1934); 159-274, pls 25, 26 (1936).
- Glibert, M., & L. van de Poel, 1965. Les Bivalvia fossiles du Cénozoïque étranger des collections de l'Institut royal des Sciences naturelles de Belgique, 1. Palaeotaxodontida et Eutaxodontida. — Mémoires de l'Institut royal des Sciences naturelles de Belgique, (2)77: 1-112.
- Hoernes, M., 1870. Die fossilen Mollusken des Tertiärbeckens von Wien, 2. — Abhandlungen der kaiserlich-königlichen geologischen Reichsanstalt zu Wien, 4: 479 pp., 85 pls.
- Kautsky, F., 1932. Die Bivalven des niederösterreichischen Miocäns (Taxodonta und Veneridae). Mit einem Beitrag zur Frage der Entstehung der Arten. — Verhandlungen der geologischen Bundesanstalt, 1932(9-10): 131-137.
- Lauriat-Rage, A., 1981. Les bivalves du Redonien (Pliocène atlantique de France). Signification stratigraphique et paléogéographique. — Mémoires du Musée national d'Histoire naturelle, (C)45: 1-173, 16 pls.
- Mayer, C., 1868. Catalogue systématique et descriptif des fossiles des terrains tertiaires qui se trouvent au Musée Fédéral de Zurich, 3. Arcidae. — Journal trimestriel de la Société des Sciences naturelles de Zurich, 1868: 1-124.
- Nyst, P.H., 1848. Tableau synoptique et synonymique des espèces vivantes et fossiles de la famille des Arcacées avec l'indication des dépôts dans lesquels elles ont été recueillies, 1. Genre Arca. — Mémoire de l'Académie royal des Sciences, Lettres et Beaux-Arts de Belgique, 22: 3-79.
- Orbigny, A. d', 1850. Prodrome de paléontologie stratigraphique universelle des animaux mollusques et rayonnées, faisant suite au cours élémentaire de paléontologie et de géologie stratigraphiques, 2. Paris (Masson), 428 pp.
- Reinhart, P.W., 1935. Classification of the pelecypod family Arcidae. — Bulletin de l'Institut royal des Sciences naturelles de Belgique, 11(13): 1-68, 5 pls.
- Reuss, A.E., 1860. Die marinen Tertiärschichten Böhmens und ihre Versteinerungen. — Sitzungsberichte der mathematisch-naturwissenschaftlichen Classe der Königlichen Akademie der Wissenschaften zu Wien, 39: 207-285, 8 pls.
- Rost, H., 1955. A report on the family Arcidae (Pelecypoda). —

Plate 1

- Fig. 1a-c. *Acar clathrata* (Defrance, 1816).
Lectotype of *Arca bohemica* Reuss, 1860, left valve. Rudelsdorf, Bohemia, Czechoslovakia. Coll. Naturhistorisches Museum, Vienna (Reuss Collection); 1a-b: x 2.5; 1c: x 4.
- Fig. 2a-b. *Barbatia (Cucullaearca) rudis* (Deshayes, 1824)
Left valve; Chaussy, dept. Seine-et-Oise, France; RGM 230 000 (ex collection Instituut voor Mijnbouwkunde Technische Hogeschool, Delft), x 1.4.
- Fig. 3a-c. *Barbatia (Cucullaearca) vincenti* (Couffon, 1905)
Paulmy, dept. Indre-et-Loire, France; RGM 229 999 (leg. M. van den Bosch); 3a-b, left valve, x 1.4; 3c: dorsal view of articulated specimen, x 1.4.
- Fig. 4a-c. *Barbatia (Cucullaearca) vincenti* (Couffon, 1905)
Juvenile specimen, left valve; Paulmy, dept. Indre-et-Loire, France; RGM 229 998 (leg. M. van den Bosch); 4a-b: x 2.5; 4c: x 4.
- Fig. 5a-c. *Acar clathrata* (Defrance, 1816)
Left valve; Amberre, near Mirebeau, dept. Vienne, France; RGM 229 997 (leg. M. van den Bosch); 5a-b: x 2.5, 5c: x 4.

RGM registration numbers refer to the collection of the National Museum of Natural History (Department of Palaeontology, Cainozoic Mollusca) at Leiden, The Netherlands (formerly Rijksmuseum van Geologie en Mineralogie).

PLATE 1



- Allan Hancock Pacific Expeditions, 20(2): 177-249, figs 79-95, pls 11-16.
- Saint Martin, J.P., 1975. Les arcidés des Faluns de la Loire. Étude de populations d'*Arca turonica*. — Travaux du Laboratoire de Paléontologie, Université de Paris, Faculté des Sciences d'Orsay, 1975: 81-169, 52 figs, 2 pls.
- Sandberger, F., 1858-1863. Die Conchylien des Mainzer Tertiärbeckens, 1-8. Wiesbaden (Kreidel), 1: 1-40, pls 1-5 (1858); 2: 41-72, pls 6-10 (1858); 3: 73-112, pls 11-15 (1859); 4: 113-152, pls 16-20 (1860); 5/6: 153-232, pls 21-30 (1861); 7: 233-270, pls 31-35 (1862); 8: 271-468 (1863).
- Sowerby, J. de C., 1823-1825. The mineral conchology of Great Britain; or coloured figures and descriptions of those remains of testaceous animals or shells, which have been preserved at various times and depths in the earth, 5 (71-86). London (The author), pp. 1-171, pls 408-503.
- Studencka, B., 1986. Bivalves from the Badenian (Middle Miocene) marine sandy facies of southern Poland. — *Palaeontologica Polonica*, 47: 3-128, 6 figs, 3 tabs, 18 pls.
- Vincent, É., 1889. *Arca scabrosa* Nyst. — *Annales de la Société royale Malacologique de Belgique*, 24: clxvii-clxix.
- Manuscript received 15 August 1992, revised version accepted 27 October 1992.