

A NEW SPECIES OF BIVALVE, *LIMATULA GRAVINAE* (PLEISTOCENE, SOUTHERN ITALY)

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Riassunto. È qui descritta una nuova specie di *Limatula* trovata nei silt argillosi pleistocenici affioranti nei dintorni di Gravina in Puglia (Bari). Il deposito rappresenta il termine regressivo della Formazione delle "Argille di Gravina".

Abstract. A new species of *Limatula* is erected. The material derives from clayey silt cropping out near Gravina in Puglia that represents the regressive final phase of the Pleistocene "Gravina Clay" Formation.

Introduction.

The specimens described in this note as *Limatula gravinae* n. sp. were discovered in three bulk samples collected in Pleistocene bluish-grey clayey silt. The deposit crops out at the Spinalva locality, along a small valley (Fig. 1) on the western margin of the *Murgia* Highland and it is mapped as *Argille di Gravina* (Gravina Clay) on the official geological map-sheet (F.°188 "Gravina in Puglia", 2nd ed.). In the area under consideration, the clayey silt corresponds to the upper part of this lithostratigraphic unit which, together with the overlying silty sand and conglomerate, referable to *Sabbie di Monte Marano* and *Conglomerato di Irsina* formations respectively, represents the regressive sequence of the "Fossa Bradanica" (Bradanic Graben) sedimentary cycle. Detailed descriptions of the sequence and the evolution of the depositional environment as inferred by palaeoecological and sedimentological analyses, are given by Caldara, D'Alessandro and Loiacono (1989).

Limatula gravinae has been found in three fossil assemblages interpreted by the authors mentioned as residual fossil communities that inhabited muddy bottoms located in the transitional zone between the infralittoral and the circalittoral, as well as in the

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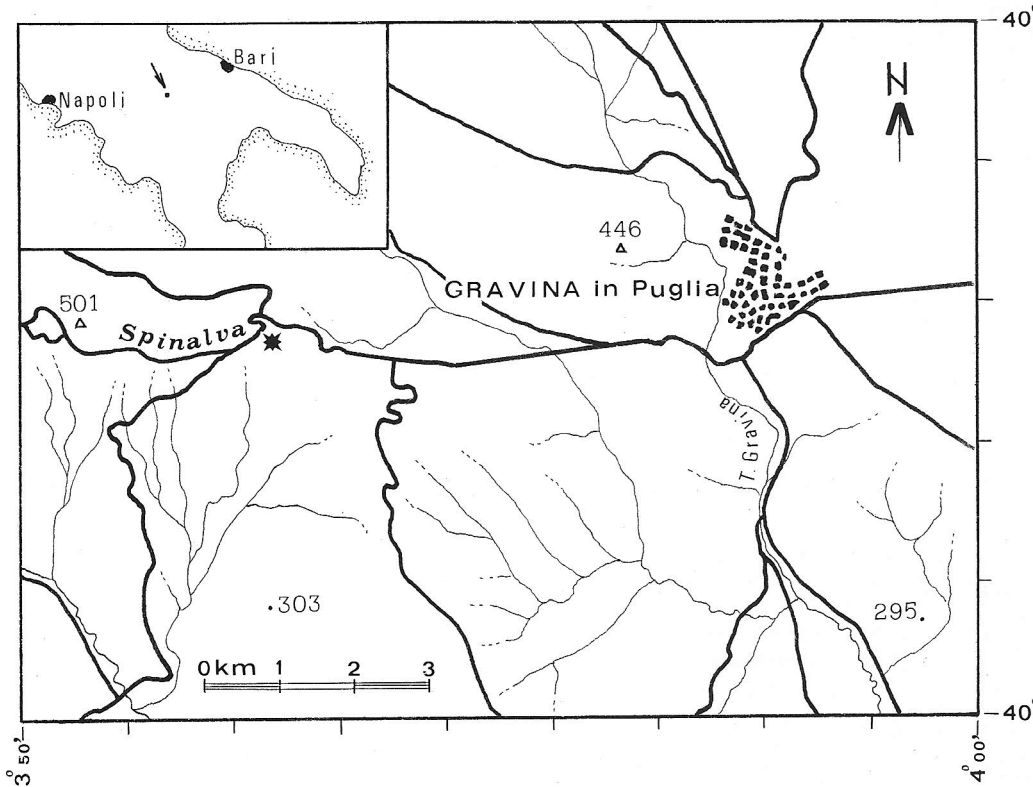


Fig. 1 - Location of the type-locality, Spinalva.

lower part of the infralittoral zone. *Limatula gravinae* shells, although usually rare, are somewhat more frequent (dominance of phylum 0.03%) in one of these palaeocommunities that Caldara et al. (1989) compared to a "heterogeneous community" (Pérès, 1967) in its initial stage (Di Geronimo, 1984) in which the influence of the "fine well sorted sand" (SFBC in Pérès & Picard, 1964) biocoenosis is clearly recognizable.

Genus *Limatula* Wood, 1839

Limatula gravinae n. sp.

Pl. 43, fig. 1, 2, 5, 7, 8; Pl. 44, fig. 1-3, 5, 7

Origin of name. From Gravina in Puglia.

Type-series. Holotype: left valve no. DGGB 159 (Pl. 43, fig. 2). Paratypes: right valve no. DGGB 164 (Pl. 44, fig. 1); right valve no. DGGB 165 (Pl. 44, fig. 2); left valve no. DGGB 166 (Pl. 44, fig. 3); unfigured left valve no. DGGB 171.

Horizon. Gravina Clay, Lower Pleistocene.

Type-locality. Spinalva near Gravina in Puglia (BA).

Collocation. DGGB 158, 159, 161-166, 168, 169, 171 stored in the Department of Geology and Geophysics, University of Bari, Italy.

Material. 23 valves including the type-series, plus numerous fragments.

Diagnosis. Small, slightly opisthoclinal, moderately convex, higher than long limatulid shell. External surface covered by prominent, radial ribs (16-22), subtriangular in cross section, intersected by faint cross-ridges or lamellae. Ribs gradually broadening toward both the anterior and posterior margins. Hinge edentulous.

Description. Shell equivalve, slightly inequilateral, small sized, moderately inflated shell (Pl. 44, fig. 7); regularly oval in outline, margins not gaping, auricles small, subequal. The umbo-pallial diameter of large specimens is over 4 mm; in most shells collected the height ranges from 2.5 to 0.5 mm and the length from 1.7 to less than 0.5 mm.

Umbones straight or faintly bent and protruding somewhat over the straight hinge margin. Wide, triangular, cardinal area with a relatively large, shallow ligament pit and rather obscure longitudinal grooves (Pl. 43, fig. 8 and Pl. 44, fig. 7); hinge edentulous (Pl. 43, fig. 8).

The sculpture is made up of prominent, radial ribs, triangular in cross section, covering the entire surface of the shell, except for the umbonal area and separated by wide grooves; toward both the lateral margins the ribs are relatively thinner but remain prominent, the interspaces being wider. Commonly the number of ribs is 18-19 in the mature stage; intercalated riblets are absent (Pl. 44, fig. 2). Numerous lamellar growth rugae cross the radiating elements, some of the stronger ones rising as short lamellae or cross-ridges (Pl. 43, fig. 7) giving the ribs a somewhat jagged appearance (Pl. 44, fig. 3).

Internal surface smooth, except the ventral margin that is crenated by the external radial ornament (Pl. 43, fig. 1). Adductor and pallial scars obscure.

Remarks. This new species of limid has been referred to the genus *Limatula* Wood, 1839 mainly because the shells do not gape and the hinge is edentulous. This last feature prevents attribution to *Limea* Bronn, 1831 as defined in the Treatise (Cox & Hertlein, 1969, p. 389), even if the oval shape of valves and the prominent, distinct ribs regularly distributed over the entire external surface are reminiscent of its subgenus *Notolimea* Iredale, 1924.

The general shape of *Limatula gravinae* n. sp. strikingly resembles that of the species named by Forbes (1843) *Lima* (*Limatula*) *crassa* (= *Limea crassa*) as usually interpreted by Authors (compare in Pl. 44, fig. 4 to fig. 5). The species was erected on recent material dredged in the Aegean Sea. Unfortunately the Forbes' original diagnosis (1843,

p. 193) is incomplete and unsatisfactory (Jeffreys, 1879, p. 573), in particular no detail was given for the hinge-plate features, furthermore the type material was not illustrated and it is apparently lost. It was suggested early (i.e. Monterosato, 1872, 1874) that Forbes' poorly defined taxon could correspond to Loven's *Limea sarsi* (1846). Few subsequent Authors retained both the specific names (Cerulli Irelli, 1909; Lucas, 1980); others judged the two forms distinguishable at subspecies rank (i.e. Nordsieck, 1969), most accept the suggested synonymy (i.e. Di Geronimo & Panetta, 1973), but refer the two discussed forms to the taxon *Notolimea* Iredale (Di Geronimo, 1974) also on the basis of the hinge feature of the better described *Limea sarsi* (Pl. 43, fig. 6).

Even if we cannot be sure that Forbes' type material possessed a dentate hinge, however it is clear that recent specimens externally resembling Forbes' *Limea crassa* have been dredged in the Adriatic Sea near the dalmatian coast (Pl. 44, fig. 4, courtesy N. Melone) and in the Mediterranean near Palermo (Pl. 43, fig. 4, RSMNH 1961.61; courtesy of Heppell). These specimens bear numerous, transverse teeth along the whole hinge margin.

To sum up, in spite of the superficial resemblance to the questionable Forbes' species, the Pleistocene specimens from the Gravina Clay must be treated as a distinct taxon.

From the palaeoecological point of view specimens reported in literature under the name *Limea crassa* (Forbes), or *Limea sarsi* (Loven), have been found in Pleistocene sediments of Grammichele (Di Geronimo et al., 1984) and Mineo (Amore et al., 1985) in Sicily, of Gallipoli (Caldara et al., 1980) in Puglia and of Rhodes (unpublished data) interpreted as deposited in deep-circalittoral settings. Furthermore thousands of specimens displaying a lamellar, concentric ornamentation (Di Geronimo's private collection, Pl. 44, fig. 6) have been collected in deep circalittoral and bathyal zones of the Mediterranean Sea (Ligurian Sea, Lyon Gulf, Corsica, Sardinia, Sicily and Greek offshore, Sicily Strait, Ionian Sea). In contrast *L. gravinae* apparently preferred shallower fine-sandy mud biotopes.

Limatula gravinae also resembles *Limatula gwyni* (Sykes, 1903) and *Limatula ovata* (Wood, 1848) but the sculpture of *L. gwyni* is characterized by intercalated riblets (Pl. 43, fig. 3) and in *L. ovata*, the ribs became obsolete or disappear on both sides of the valve.

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PLATE 43

- Fig. 1 - *Limatula gravinae* n. sp. Internal view of the right valve, no. DGGB 158; x 45.
 Fig. 2 - *Limatula gravinae* n. sp. External view of the left valve. Holotype no. DGGB 159; x 58.
 Fig. 3 - *Limatula gwyni* (Sykes). External view of a right valve. The intercalated riblets are clearly visible; no. DGGB 160; x 28.
 Fig. 4 - *Limea crassa* (Forbes). Specimens dredged near Palermo. Notes the differences in ornamentation between this valve and that in Pl. 44, fig. 6; no. RSMNH 1961.61; x 12.5.
 Fig. 5 - *Limatula gravinae* n. sp. External view of the right valve, no. DGGB 161; x 45.
 Fig. 6 - *Limea sarsi* (Loven). From Rockall Bank, no. RSMNH 1979.038.32102; x 20.
 Fig. 7 - *Limatula gravinae* n. sp. Detail of the sculpture; no. DGGB 162; x 75.
 Fig. 8 - *Limatula gravinae* n. sp. Hinge-plate area showing the edentulous hinge, the large shallow legament pit and the longitudinal grooves; no. DGGB 163; x 100.

PLATE 44

- Fig. 1 - *Limatula gravinae* n. sp. External view of the right valve. Paratype no. DGGB 164; x 45.
 Fig. 2 - *Limatula gravinae* n. sp. External view of the right valve. Paratype no. DGGB 165; x 64.
 Fig. 3 - *Limatula gravinae* n. sp. External view of the left valve, note the jagged sculpture on the left side of the shell. Paratype no. DGGB 166; x 45.
 Fig. 4 - *Limea crassa* (Forbes). External view of a left valve from the Eastern coast of the Adriatic Sea, no. DGGB 167; x 8.7.
 Fig. 5 - *Limatula gravinae* n. sp. External view of the right valve, no. DGGB 168; x 17.
 Fig. 6 - *Limea crassa* (Forbes). External view of a right valve from the Thyrrhenian Sea, showing a lamellar sculpture. Di Geronimo's collection; x 73.
 Fig. 7,8 - Compare the moderate convexity of the shell in *L. gravinae* (fig. 7, DGGB 169; x 75) to that of the type-species *L. subauriculata* (Montagu) (fig. 8, DGGB 170; x 47.5).

