

# Littoral Pliocene Molluscs dredged at the depth of 2,200 m in the Tyrrhenian Sea

by

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During the Tyrrhenian Sea cruise T70 of the Laboratorio di Geologia Marina in Bologna aboard the R/V *Bannock*, a conglomerate rock containing a mollusc fossil fauna of special interest was dredged off the east coast of Sardinia. The location was the south side of the Orosei canyon, between 2170 and 1982 meters of depth (coordinates of the starting and ending points of dredging: T70/48-40°12.9'; 10°15.0' and 40°12.3'; 10°14.4').

The sample collected consists not only of the fossiliferous conglomerate but also of a very compact gray-blue clay and a yellow mud collected by the dredge in this order. The conglomerate was the material first collected by the dredge and for this reason we believe that it outcrops at the maximum depth reached by the dredge, i.e. about 2,200 meters.

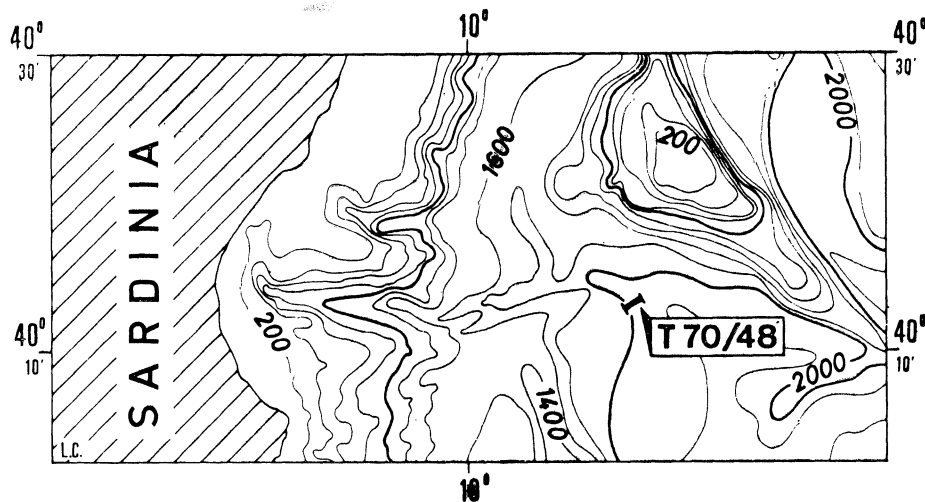


FIG. 1. — Dredging location.

The conglomerate consists of large stones, up to 25 cms or more across, made of black vesicular lava associated with smaller elements of coarse sandstone and black, greenish, grey, or dark yellow marls and sandy clay. Rounded quartz pebbles are also very common. The cement is arenaceous and usually not very hard. On the whole, molluscs are well preserved, even if they are broken or crumbled.

A list of the species encountered is shown in the following table.

Insofar as the age of fauna is concerned, it should be pointed out that the majority of the species determined is not of great stratigraphic importance. Nevertheless, all forms are present in the Pliocene of the Mediterranean basin. *Amyclina semistriata* f. *dertonensis* and *Flabellipecten flabelliformis* are the most significant. *A. semistriata*, in particular, is very frequent all through the Pliocene, whereas it is only rarely encountered in the Quaternary. SACCO [1897] already indicated *F. flabelliformis* as one of the most frequent species peculiar to the Middle and Upper Pliocene; this distribution is also confirmed by recent authors. Only GIGNOUX [1913] and ROGER [1939] believed that this form was also present in the Calabrian. *F. flabelliformis* is reported at the basis of the middle-pliocène transgression in Romagna [RUGGIERI, 1962], and in the most classical series in Italy. Therefore, it can be affirmed that the conglomerate is undoubtedly Pliocene and probably belongs to the Middle-Upper Pliocene. On the other hand, its age is confirmed by the microfaunas contained in the clays found above the conglomerate [FABBRI & SELLI 1973].

Regarding the environment in which the deposit developed one should refer to the habitat of the forms that also at present live in the Mediterranean Sea. All species are shallow water inhabitants and must be included in the populations of the infralittoral zone, that in the Mediterranean Sea is about 30-40 meters of depth at the most. *Gibbula adansoni* and *Polinices josephina* are characteristic of coastal waters, since they can reach only a few meters of depth: the former lives preferably on algae and the latter on the sand. *Glycymeris glycymeris* and *Dosinia exoleta*, though being able to reach greater depths, are typical of coarse-sand seafloor characterized by presence of strong currents. The other forms also confirm a limited depth suggested above. Therefore, the environment must be considered as coastal; it is characterized by remarkable current and wave dynamics which, on the other hand, is also confirmed by the granulometry of the deposit.

S P E C I E S	M A I N   D I S T R I B U T I O N				Vertical range in m
	M I O C E N E	P L I O C E N E	P L E I S T O C E N E	O L O C E N E	
<i>Bibbula adansoni</i> (Payraudeau)	—	—	—	—	0 - 1.5
<i>Polinices josephina</i> (Risse)	—	—	—	—	2.5 - 25
<i>Lunatia catena</i> (Da Costa) f. <i>helicina</i> (Brocchi)	—	—	—	—	5 - 50
<i>Amyclina semistriata</i> (Brocchi) f. <i>dertonensis</i> (Bell.)	—	—	—	—	10 - 400
<i>Vexillum</i> ( <i>Uromitra</i> ) <i>plicatula</i> (Brocchi)	—	—	—	—	5 - 70
<i>Ringicula auriculata</i> (Menard)	—	—	—	—	10 - 40
<i>Glycymeris glycymeris</i> (Linneo)	—	—	—	—	0 - 120
<i>Flabellipecten flabelliformis</i> (Brocchi)	—	—	—	—	?
<i>Divaricella divaricata</i> (Linneo)	—	—	—	—	3 - 40
<i>Cardium</i> ( <i>Acanthocardia</i> ) cfr. <i>echinatum</i> (Linneo)	—	—	—	—	3 - 400
<i>Chione ovata</i> (Pennant)	—	—	—	—	0 - 200
<i>Dosinia</i> cfr. <i>exoleta</i> (Linneo)	—	—	—	—	3 - 150
<i>Aloidis gibba</i> (Olivi)	—	—	—	—	2 - 150

Tab. 1. — Stratigraphical and bathimetric distribution of the identified species.

I conclude, therefore, that the conglomerate was formed at the base of the marine transgression at the Middle Pliocene. In this area of the Tyrrhenian a situation quite similar to that occurring in the Italian peninsula may arise, where the Middle Pliocene transgression is well-defined and well-known all along the Apennines, both in the Adriatic and in the Tyrrhenian sides. The tectonic lowering of land, which submerged the conglomerate to its present considerable depths, would therefore have to originate at the Middle-Upper Pliocene time [FABBRI & SELLI, 1973].

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