

Sansonia italica n. sp.: first evidence of *Sansonia*
JOUSSEAUME 1892 from the Mediterranean Pliocene
(Gastropoda: Prosobranchia).

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With 3 figures.

Abstract: The genus *Sansonia* JOUSSEAUME 1892 is recorded for the first time from the Mediterranean Pliocene. A new species, *Sansonia italica* n. sp., is described after three shells collected in a bathyal Piacenzian sequence at Campore (Parma, Italy).

Kurzfassung: Die Gattung *Sansonia* JOUSSEAUME 1892 wird zum ersten Mal aus dem mediterranen Pliozän nachgewiesen. Eine neue Art, *Sansonia italica* n. sp., wird nach drei Gehäusen aus einer Tiefwasserfazies des Piacenziums von Campore (Parma, Italien) beschrieben.

Introduction.

During our research on the mollusk faunas of the Italian Pliocene, we found a few shells attributable to a new species of the genus *Sansonia* never before recorded for the Mediterranean Pliocene. This genus was described by JOUSSEAUME (1892) who considered as type the species described and figured by WATSON 1886 as *Iphitus tuberculatus*.

Sansonia is a cosmopolitan pantropical taxon already present in the mid Miocene of Banat, Rumania (TAVIANI & SABELLI 1982a).

Iphitus tuberculatus was described by WATSON (1886) on the basis of a single specimen dredged by the R/V Challenger northeast of Culebra Island, eastern Atlantic, at a water depth of 713 m. Later, the species was recognized by BAVAY (1922) in the shelly sands of Colon (Caribbean sea) at shallow depth. A further record of two specimens, one from a shallow water Pleistocene formation of Cuba (*Mecoliotia bermudezi* CLENCH & AGUAYO 1936: synonym of *tuberculata* according to MOORE 1963) and another off the Florida coast at about 100-110 m of depth (*Mecoliotia tuberculata*; MOORE 1963) suggests either a possible resedimentation of

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the specimen dredged by the Challenger or that this species is eurybathic. Most findings however have been reported from shallow waters (TAVIANI & SABELLI 1982a, with references therein).

IREDALE (1917) described the new genus *Pickworthia*, younger synonym of *Sansonia* according to BAVAY (1921), for two new species from the Christmas Islands (Indian Ocean) found at a depth of 100 fathoms. This author however admitted a possible resedimentation of this material. Moreover his new species, *P. kirkpatricki* and *P. andrewsi*, are synonyms (BAVAY 1921) of *Sansonia andrei* JOUSSEAUME 1921 and *S. sansonia* JOUSSEAUME 1921 from shallow environments near Jeddah (Red Sea) respectively.

Pickworthia IREDALE 1917, *Mecoliotia* HEDLEY 1899 and *Microliotia* O. BOETTGER 1902, have been considered as genuine synonyms of *Sansonia* (TAVIANI & SABELLI 1982a). However, in the light of studies in progress by an international team of specialists, this too schematic supraspecific arrangement will be surely updated especially because of the excessive conchological variability of this "genus", only known from empty shells. In this preliminary work, we shall continue to use only the genus *Sansonia* lato sensu.

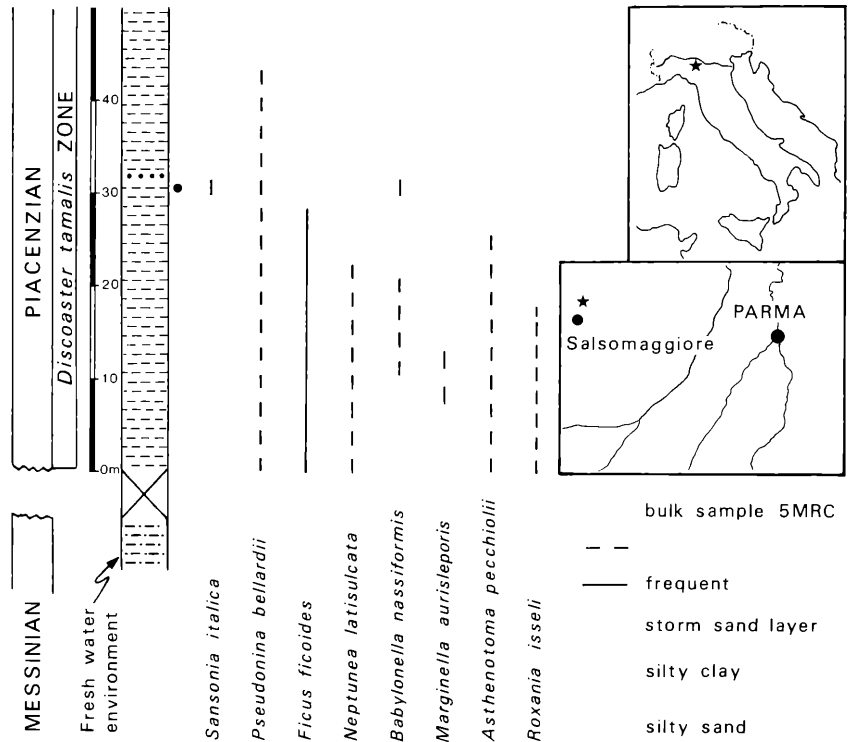


Fig. 1. Stratigraphic distribution of some selected mollusk species in the Piacenzian section of Campore quarry (Salsomaggiore, Parma, Italy).

The genus *Iphitus* JEFFREYS 1883 (= *Iphitella* THIELE 1925) that WATSON (1886) assigned to his species, is a well distinct and still valid taxon (TAVIANI & SABELLI 1982b).

Sansonia italica n. sp.

Fig. 2-3.

Description of the holotype: shell minute, solid, slightly higher than broad. Whorls 3, the last being half the size of the whole shell. Mouth subcircular, peristome double and thickened. Base unperforated, flattened, with 5 radiating smooth cords, the uppermost three very prominent and subparallel. Sculpture given by broad spiral ribs forming evident nodules at the crossings with thinner axial costae. There are three spiral ribs on the body whorl, the central one being more prominent, the upper two whorls present only two spiral ribs, of which the abapical is stronger. The axial costae are 15 on the body whorl. The outline is somewhat scalariform. Suture deep and canaliculate. Protoconch mamillate-stiliform, deviated from the axis of about 6°. Three nuclear whorls, the first one very small and smooth. The second whorl shows two very attenuated and obsolete spiral threads just above the suture, the resulting profile being subrounded. The third whorl shows a prominent central cord with two upper and two or three lower spiral threads, the resulting profile being somewhat angulate.

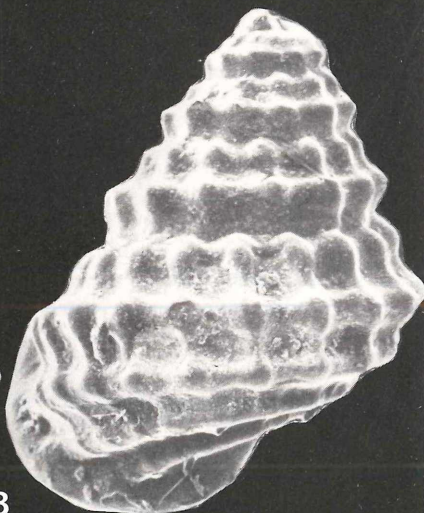
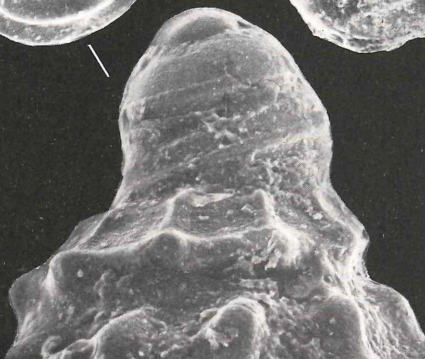
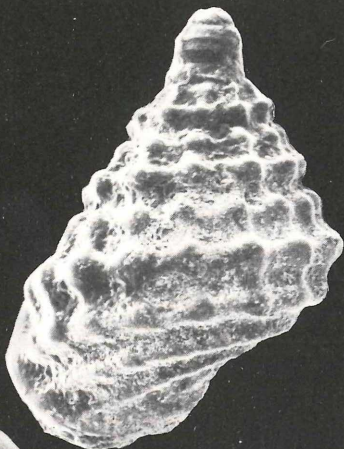
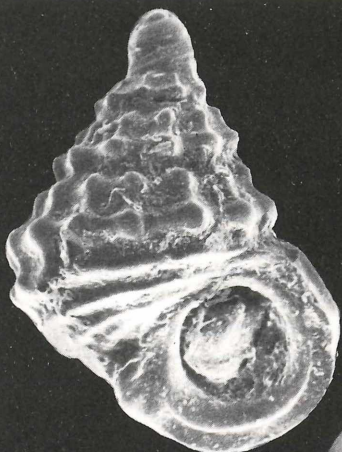
Material and dimensions: height 1.15 mm, breadth 0.98 mm (holotype: no. 003492A, Malacological Laboratory of the Museo Zoologico, University of Bologna); height 1.35 mm, breadth 1.20 mm (paratype: no. 003492B, as above); height 1.30 mm, breadth 1.15 mm (paratype: no. 256632, Natur-Museum Senckenberg, Frankfurt). — Remarks: among the collected specimens we have selected as holotype the only complete shell even if slightly younger. The two paratypes, which have 4 whorls in the teleoconch instead of 3 as in the holotype, lack the apexes.

Locus typicus: the type material was collected in a clay quarry near Campore (Salsomaggiore, Parma, northern Italy) about 4 km from the Tabianian stratotype.

Stratum typicum: the type material was obtained from a bulk sample (5 MRC) taken at 31 m within the Piacenzian sequence, 1 m below a sandy storm level (fig. 1).

Relationships.

This new species shows strong affinity with a recent Indo-Pacific species, *S. iredalei*, described by BAVAY (1921). Our specimens differ from this species mainly by having a lower height/breadth ratio (less than 1.2, while *S. iredalei* averages 1.5); furthermore the peristome of the Pliocene specimens is wider and thicker and its apex is bent and proportionally larger. Another species close to our morphotype is *Alvania kenneyi* LADD (1966) (not KAY 1979: fig 28 E, which is probably *S. iredalei*) recovered from Miocene beds drilled at Eniwetok Atoll (western Pacific), attributable, from its conchological characteristics, to *Sansonia* l. s. However, this species presents a very different apical morphology and stronger basal cords; also the peristome outline appears less thickened than the one in our species. All other species of *Sansonia* l. s. described in the literature (WATSON 1886; JOUSSEAUME 1892, 1921; HEDLEY 1899, 1902; O. BOETTGER 1902; IREDALE 1917; THIELE 1925; CLENCH & AGUAYO 1936 and SELLI 1973) are very distant from *S. italica* n. sp.



Stratigraphic and paleoecological setting.

In the whole of the area (as in most of the Po basin) the Pliocene is transgressive upon the lacustrine-fluvial sediments of the uppermost part of the Messinian (late Miocene).

In the Campore area, Tabianian sediments are not exposed and only a Piacenzian silty-clayey section crops out (Campore quarry). Biostratigraphically the entire section belongs to the *Discoaster tamalis* biozone (RIO et al. 1982).

At least 170 species of mollusks were collected in this section (RAFFI & MARASTI in progress). The mollusk collection was made through bulk samples of 36 dm³ and by direct field sampling. The mollusk fauna is characterized by the absolute dominance (in number of species) of carnivorous gastropods (prevalently turrids), followed by protobranch and filibranch bivalves; the eulammellibranchs are present with only 5 species. Such a faunistic stock is typical of an epibathyal environment (MARASTI & RAFFI 1977; GLEMAREC 1978), such as that of the Piacenzian of Maiatico and Quattro Castella recently described by MARASTI & RAFFI 1976 and 1977.

In the same sample (5 MRC) from which were found the three specimens of *S. italica* we have specifically determined the following species:

Tharsiella romettensis SEGUENZA, *Cyclostrema serpuloides* (MONTAGU), *Profundialvania perraricincta* (SACCO), *Actonia testae* (ARADAS & MAGGIORE), *Tornus excalliferus* (SACCO), *Archimediella spirata* (BROCCHI), *Epitonium frondiculoides* (BOURY), *Leiostraca subulata* (DONOVAN), *Lunatia helicina* (BROCCHI), *Naticarius epiglottinus pseudoepiglottinus* SIMONDA, *Amyclina italica* MAYER, *Amyclina pseudocostulata* (VENZO & PELOSIO), *Hinia turbinellus* (BROCCHI), *Bonellitia bonellii* (BELLARDI), *Babylonella nassiformis* (SEGUENZA), *Turricula dimidiata* (BROCCHI), *Clavus sigmoides* (BRONN), *Gemmula rotata* (BROCCHI), *Pleurotomoides elegantissima* (FORESTI), *Pleurotomoides scalarium* (JAN), *Nucula sulcata* BRONN, *Malletia caterinii* (APPELLIUS), *Nuculana hoernesii* (BELLARDI), *Nuculana concava* (BRONN), *Anadara diluvii* (LAMARCK), *Limopsis aurita* (BROCCHI), *Korobkovia oblonga* (PHILIPPI), *Chlamys angelonii* (DE STEFANI & PANTANELLI), *Limea strigillata* (BROCCHI), *Abra longicallus* (SCACCHI), *Kelliella abyssicola* (FORBES), *Pecchiolia argentea* (MARITI), *Cadulus ventricosus* (BRONN), *Dentalium sexangulum* GMELIN, *Fustiaria triquetra* (BROCCHI), *Entalina tetragona* (BROCCHI).

Of particular significance in this stock is the presence of *P. perraricincta*, *A. testae*, *E. tetragona*, *F. triquetra*, *K. oblonga*, *C. angelonii*, *A. longicallus* and *K. abyssicola* typically characterizing the upper epibathyal of the Mediterranean Pliocene.

The sampling method applied at Campore ensures that our *Sansonia* effectively originate from the level indicated, that is our bulk sample was not contaminated by faunas from upper levels (such as the storm level immediately above). However *Sansonia* is generally regarded as living in shallow water (TAVIANI & SABELLI 1982a): as reported above some species (i. e. *S. tuberculata*, *kirkpatricki* and *andrewsi*) found by their authors in relatively deep waters, were later discovered to be synonyms of shallow water species. In the light of such evidence, it would be logical to suppose that our specimens also had been resedimented from shallower environ-

◀ Fig. 2-3. *Sansonia italica* n. sp. — 2) holotype [LMB 003492A], 3) paratype [LMB 003492B]; SEM pictures; front and back views $\times 2.5$, apex $\times 10$.

ments. This possibility is not to be completely discarded since sandy veneers and thin layers (such as the storm level) are present throughout the section. However our specimens do not show any evident trace of reworking. On the contrary, they appear quite fresh as do the rest of the epibathyal found therein. Moreover, the lack of evidence of this species within the well known littoral deposits of the Mediterranean Pliocene from which our specimens would have had to be removed renders a resedimentation even less probable. It seems more logical therefore to admit that *Sansonia* has probably a bathymetric range larger than that previously supposed.

Our bulk sample lies about 4 m above a point in the section which marks the disappearance of a particular stock of species e.g.: *Pseudonina bellardii* (MICHELOTTI), *Ficus ficoides* (BROCCHI), *Neptunea latisulcata* BELLARDI, *Babylonella nassiformis* (SEGUENZA), *Marginella aurisleporis* (BROCCHI), *Asthenotoma pecchiolii* (BELLARDI) and *Roxania isseli* (BELLARDI). These species belong to a larger group of mollusks (RAFFI & MARASTI 1976, 1977) whose disappearance from the Po basin approximates the Mammoth paleomagnetic event (see RAFFI & MARASTI 1982; SPROVIERI & RAFFI in prep.). This fact represents the first important extinction during the Pliocene and marks the transition from a period (Tabianian and lower Piacenzian) of elevated taxonomic stability to another (from middle Piacenzian to Recent) characterized by a progressive increase of the taxonomic diversity. No evidence either contradicting such a model or indicating local differences has been reported for the Mediterranean basin. The recent analysis of SPROVIERI (pers. com.) on the extinctions of the foraminifer fauna of Monte Narbone (Sicily) Pliocene section, calibrated by biochronological data, fully confirms what has already been observed in the Po basin through the study of the mollusk fauna; this fact renders more probable the hypothesis that the trend may be valid in the whole Mediterranean basin. On the other hand it has to be stressed that this trend is the same in all the known Pliocene basins of the Atlantic dominion (Atlantic coasts of U. S. A., Iceland, England, Belgium, Holland; see references in RAFFI & MARASTI 1982) and represents an evident response to the Pliocene climatic evolution characterized by a progressive cooling.

Conclusions.

The genus *Sansonia* represents an excellent example of a pantropical cosmopolitan taxon. If we consider its present geographic range (Australia, Red Sea, Caribbean, Philippines etc.), which is diffused but typically limited to tropical areas, we must admit that the distribution of the genus took place in a completely different paleogeographic situation more favorable for a cosmopolitanism of the tropical mollusk faunas. Thus, we can suppose that the main migratory events of this genus began at least before the closure of the marine gateway between the Indian and the Atlantic oceans, about 18 m. y. b. p. (BERGGREN & HOLLISTER 1974; BERGGREN 1981). It is evident that migratory events between the Atlantic and Pacific oceans could well have continued, through the central American gateways until the middle Pliocene (4.3 m. y. b. p.). However, an old phyletic age of *Sansonia* appears to be the most probable hypothesis especially considering the Miocene records of this genus in the Parathetys of central Europe (as *Microliotia brandenburgi*) and at Eniwetok Atoll (as *Alvania kenneyi*). Clearly the available data, regarding in particular the paleontological record, are still insufficient to fully understand the

problem of the origin (i. e. the speciation center) and radiation of *Sansonia* l. s. We would like to point out that, with respect to other taxonomic groups, the well defined generic characteristics of *Sansonia* l. s. , as well as its restricted number of species, make it a potentially excellent paleobiogeographic tracer whose full importance will be wholly appreciated only after the completion of the taxonomic and paleobiogeographic studies presently in progress.

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