SOME REMARKS ON *APULITES GIGANTEUS* TAVANI, 1958

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Riassunto. Vengono discussi e ridescritti il genere *Apulites* Tavani, 1958 e la specie—tipo *A. giganteus* Tavani, 1958 ritrovati in una successione carbonatica affiorante nelle Murge occidentali e riferibile al Cretaceo superiore.

Lo stato di conservazione e l'abbondanza degli esemplari pugliesi ha permesso di ampliare le conoscenze tassonomiche e stratigrafiche di questi taxa. Il genere *Apulites* viene quindi tolto dalle sottofamiglie *Radiolitinae* (Tavani, 1958) e *Sauvagesiinae* (Dechaseaux & Coogan, 1969) e collocato nella sottofam. *Biradiolitinae* per la struttura del guscio a maglie quadrangolari e per l'assenza della cresta legamentare.

Abstract. Numerous specimens belonging to the *Apulites giganteus* Tavani, 1958 have been discovered in a carbonate sequence of Western Murge that belongs to the "Calcare di Altamura" unit (Upper Cretaceous). In this study both genus and type—species are reexamined and redescribed, since the discovery of the Apulian specimens has permitted new paleontological and stratigraphical observations.

The genus *Apulites* should more correctly be ascribed to the subfamily *Biradiolitinae* on the basis of following characteristics: its wall structure consisting of quadrangular prismatic cells, and the absence of a posterior ligament.

Introduction.

A rich assemblage of rudists was gathered during a geological survey of an area situated in Tav. 189 II SE «Mass.ia del Porto» (Western Murge) (Fig. 1). Together with other rudists which have not yet been determined, the assemblage contains numerous specimens of *Apulites giganteus* Tavani. This species was instituted by Tavani in 1958 as the type—species of his new genus *Apulites*, on the basis of examples from Senonian levels outcropping in the Murgia del Ceraso locality (Fig. 1). Until now there have not been any other discoveries concerning this species, with the exception of Sliskovic's researches in 1973 (in which a new species, *A. lublanensis*, is also described) and, those of Pleni-

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car in 1974. The Yugoslavian specimens coming from Bosnia and Herzegovina (Sliskovic, op. cit.) and Slovenia (Plenicar, op. cit.) have been referred by the Authors to the Maastrichtian age.

The fossils studied in this paper, from the Upper Cretaceous of the Western Murge, were found in very dense, randomly distributed, clusters. In these clusters the specimens are so crowded that morphology of younger individuals is conditioned to a great extent by that of the adults (Fig. 2).

The discovery of these numerous specimens has permitted new paleontological and stratigraphical observations, in the light also of Sliskovic's detailed study (op. cit.).

Geo–stratigraphical outline.

The specimens examined were found in a carbonate sequence 310 m thick outcropping near «La Casalina» locality (northern part of area mapped in Tav. 189 II SE Mass.ia del Porto) (Fig. 1). This succession is related to the high part of the «Calcare di Altamura» unit (Senonian–Maastrichtian) (Valduga, 1965; Ricchetti, 1975), on the basis of regional biostratigraphical considerations. Indeed in the lower part of the sequence calcarenitic levels with *Orbitoides* spp. can be observed, already noted by Ricchetti (1975) and Luperto Sinni and Ricchetti (1978) and referred to the Campanian–Santonian age.

Furthermore in the middle part, micritic and biomicritic levels with *Raadshovenia salentina* (Papetti & Tedeschi) and *Murciella cuvillieri* Fourcade

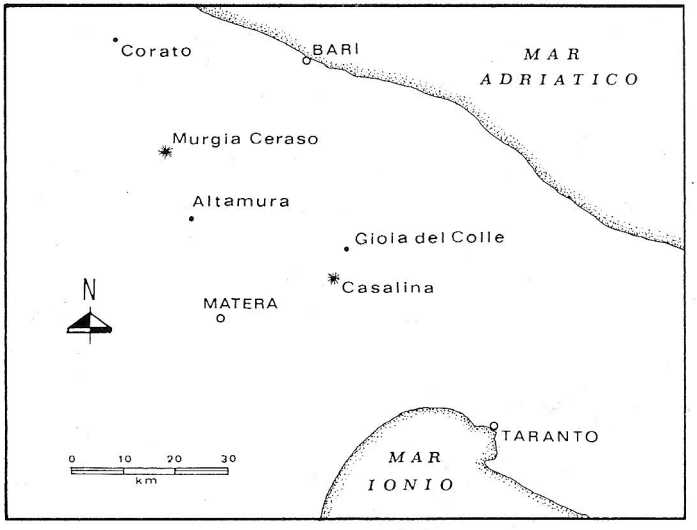

Fig. 1 – Geographical setting of Apulian fossil localities that are marked by an asterisk.

occur. These levels can be correlated with the same layers outcropping to the south of Gioia del Colle and dated lower Maastrichtian by Ricchetti and Luperto Sinni (1978).

In particular, the fossiliferous horizon with *Apulites giganteus* Tavani is observable in the middle–high part of the sequence corresponding to the Maastrichtian age.

Systematic description (1)

Tavani (1958) ascribed his genus *Apulites* to the subfamily *Radiolitinae*, because of the AV wall structure, composed of quadrangular cells. The Author, observing in the siphonal bands the presence of finely costulate folds, remarks: «nel complesso il nuovo genere *Apulites* presenta i caratteri delle *Sauvagesiinae* per quanto riguarda il tipo di zone sifonali, mentre per il carattere della struttura del guscio rientra piuttosto nel gruppo delle *Radiolitinae*, pur differendone notevolmente nel dettaglio»; the loose translation of which would be as follows: «on the whole the new genus *Apulites* has the *Sauvagesiinae's* characteristics as regards siphonal band conformations, while the wall structure would place it in the *Radiolitinae* group even though it differs considerably in its details».

Subsequently, Dechaseaux and Coogan (op. cit., p. 811) established within the subfamily *Sauvagesiinae* the genus *Apulites*, though they observed that «it may be a biradiolitine».

Sliskovic (op. cit.) and Plenicar (op. cit.) in their studies on some Yugoslavian specimens of *Apulites* have not considered the higher rank position of this genus.

The present study demonstrates that the genus *Apulites* must be referred to the subfamily *Biradiolitinae* because of the presence of a prismatic structure with subquadrangular cells in the AV wall and the absence of a posterior ligamental ridge.

Order **Hippuritoida** Newell, 1965

Superfamily *Hippuritacea* Gray, 1848

Family *Radiolitidae* Gray, 1848

Subfamily *Biradiolitinae* Douvillé, 1902

Genus *Apulites* Tavani, 1958

In 1958, Tavani proposed this genus, due to the presence in AV of the following characteristics: longitudinal, very strong costae, siphonal bands E

(1) The Dechaseaux and Coogan (1969) classification and general terminology, and the Milovanovic (1935) wall structure terminology were followed.

and S ornated by fine ribs, the lack of a ligamental ridge and a particular type of wall structure consisting of subquadrangular cells observable in the AV inner layer. The Author, also, observes the presence of an outer layer with a lamellar wall structure.

Dechaseaux and Coogan (1969) in the description of this genus report the features given by Tavani but they consider the quadrangular cells structure as a feature of the outer wall.

Sliskovic (1973), in a detailed study on some *Apulites* collected in Yugoslavia, observes that the external ornamentation and the fine ribs on the bands are not present. As regards the wall structure the Author notes the presence of two layers: the innermost of which is very thin and not always observable, and the outer very thick and consisting of a principal part with a prismatic structure with subquadrangular cells edged with a very thin lamellar zone.

Plenicar (1974), in agreement with Sliskovic, notes the absence both of external ornamentation and of the fine ribs on siphonal bands also in his specimens from Slovenia. As regards the wall structure he observes the presence of three layers: an inner thin with a feebly distinguishable structure; a middle prismatic consisting of subquadrangular cells; an external layer of lamellar structure.

Examination of more material from Apulia indicates some inconsistencies which serve to amend Tavani's original diagnosis. The comparison with the specimens studied by Tavani has been carried out only on the photographic material and on the data described by the Author. It has not been possible to examine the holotype and the paratype since they form part of substantial material held in sealed cases and destined for the soon–to–be–built, Calci Museum of Natural History (1); besides keep in mind that «Murgia del Ceraso» locality (Tav. 189, IV NW «Murgia del Ceraso») is equal to a very extensive area; unfortunately the Author does not provide more precise data, whereby the research of topotypes is rendered very difficult.

Type–species: *Apulites giganteus* Tavani, 1958

Other species: *A. lublanensis* Sliskovic, 1973

Diagnosis. FV unknown. AV cylindrical or subcylindrical in shape. The shell may be ornamented with clearly – marked longitudinal ribs or also completely smooth. Ligamental ridge absent. The shell wall structure consists of two layers: the inner one thin and lamellar and the outer one prismatic, with subquadrangular cells edged with a very thin lamellar zone.

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(1) Personal communication by Prof.ssa Elena Menesini (University of Pisa), whom 1 whish to thank.

Apulites giganteus Tavani, 1958

Text–fig. 2–5

1958 *Apulites giganteus* Tavani p. 170, pl. 25, fig. 1a–c; pl. 27, fig. 1a,b; pl. 28, fig. 2a–c.
1973 *Apulites giganteus* Sliskovic – p. 14, fig. 1–3; pl. 1, fig. 1–6.
1974 *Apulites giganteus Plenicar* – p. 178, fig. 67–70.

Diagnosis. *Apulites* ornamented with clearly–marked longitudinal costae. The shape of the shell is cylindrical. Siphonal band E flat and protruding under than S, which generally protrudes less and is sometimes slightly concave. Interband always concave.

Description. Small and medium–sized incomplete specimens, the largest specimens having a diameter of about 20 mm with a shell wall thickness of about 4.5 mm. Cylindrical and subcylindrical shape; external ornamentation consisting of large, strong costae (Fig. 3) nearly always rounded with concave intercostal zones. Ligamental ridge lacking. The band E is flat, protruding and wider than the S, that appears as a rounded rib. The interband is represented by a concave longitudinal groove which is narrower than the E.

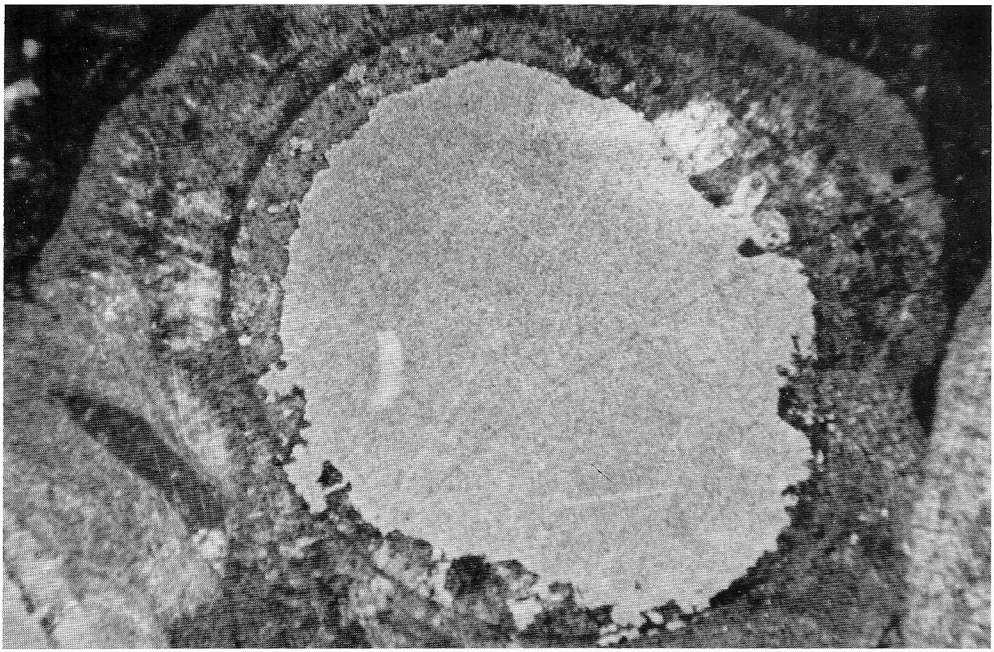

Fig. 2 – *Apulites giganteus* Tavani. Transversal section of AV in which is partially visible the inner layer of the shell wall, while that prismatic one is completely recrystallized. Furthermore it is possible to see the specimens in contact with each other.

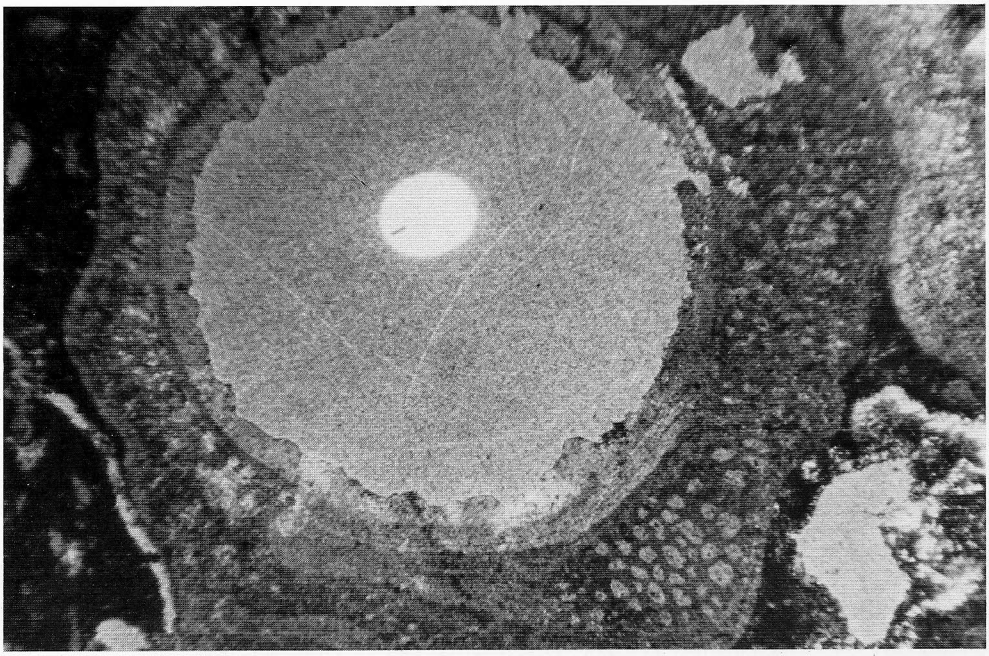

Fig. 3 – *Apulites giganteus* Tavani. Transversal section of a specimen partially recrystallized and showing the two layers of the shell wall: the innermost thin and with lamellar structure and the outer thick and with prismatic structure. Also, is visible the ornamentation consisting in well developed longitudinal costae.

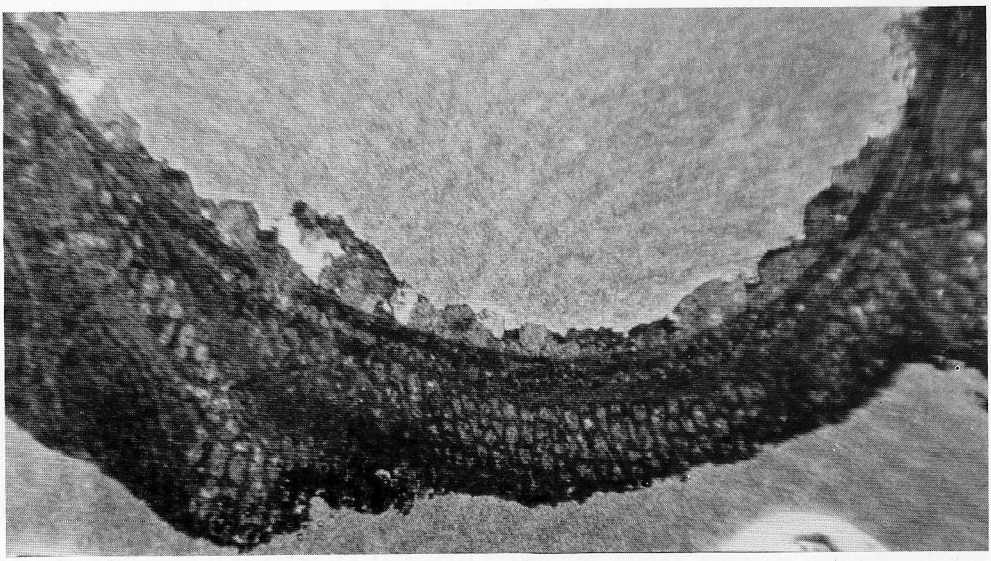

Fig. 4 – *Apulites giganteus* Tavani. Transversal section of a part of AV in which is clearly visible the characteristic structure of the outer layer of the shell wall.

In agreement with Sliskovic (op. cit.), the shell structure consists of two layers: 1) a thin, lamellar, inner layer (Fig. 3); 2) an outer layer of prismatic structure with quadrangular cells arranged in several circles (Fig. 4), which are not always visible due to the effect of recrystallization; the peripheral part of this layer is thin and of lamellar structure (Fig. 5).

Material. Numerous AV embedded in the limestone and one closed to the other in vertical living position (Fig. 2). The specimens, generally, are not greatly recrystallized.

Age and regional occurrence. Whereas Tavani attributes the Apulian species to a generic Senonian, at present on the basis of new knowledge it can be said that *Apulites giganteus* is referable to the Maastrichtian age. Sliskovic (op. cit.) and Plenicar (op. cit.) find it in the Maastrichtian of Koricani (north–west slope of the Vlasic mountain, Bosnia) and of Slovenia, respectively.

Fig. 5 – *Apulites giganteus* Tavani. Transversal section of AV in which is sometimes visible the thin lamellar zone of the outer layer of the shell wall.

Conclusions.

This paper attempts to make a contribution to the systematics of the genus *Apulites* and the type–species *A. giganteus*; on the basis of these studies the *Apulites* genus is assigned to the *Biradiolitinae* subfamily.

Also, the observations carried out on Tavani's specimens and on those from «La Casalina» locality, have pointed out that all are ornamentated with clearly marked longitudinal costae; therefore, as previously illustrated by Sliskovic (op. cit.), we can than believe that the smooth Yugoslavian specimens could be a subspecies. This conclusion can be verified only by the discovery of specimens with intermediate features.

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