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REVISION OF THE OSTRACODE SUBGENUS *PALEOBLITACYTHEREIS* BENSON, 1977

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Riassunto. Il genere *Oblitacythereis* e i due sottogeneri inclusi, *Oblitacythereis* e *Paleoblitacythereis*, sono stati descritti da Benson (1977). Tuttavia, la diagnosi originale di *Paleoblitacythereis* e la designazione della sua specie tipo si basano su esemplari erroneamente attribuiti da Benson (1977) a *Carinocythereis ruggierii* Russo, 1966. Gli esemplari illustrati da Benson (1977) sono, in realtà, chiaramente riferibili ad un'altra specie segnalata in letteratura, *Oblitacythereis* sp. 3 Russo & Bossio, 1976, come già affermato da Bonaduce & Russo (1985). In conseguenza di questa erronea attribuzione il sottogenere *Paleoblitacythereis* risulta soggetto a potenziale instabilità. La sua specie tipo dovrebbe, pertanto, essere considerata come una nuova specie a sé stante e *Carinocythereis ruggierii* Russo (specie che realmente appartiene al sottogenere *Paleoblitacythereis*) dovrebbe essere rivista. Lo studio di esemplari ben conservati, provenienti da alcune formazioni mioceniche dell'Italia meridionale, ha permesso di realizzare un'analisi dei rappresentanti italiani del sottogenere *Paleoblitacythereis*. Come risultato di questo studio viene qui proposta una revisione tassonomica delle seguenti specie: *Oblitacythereis* (*Paleoblitacythereis*) *ruggierii* (Russo, 1966) e *Oblitacythereis* (*Paleoblitacythereis*) *bossioi* n. sp. (= *Oblitacythereis* sp. 3 Russo & Bossio, 1976), che viene qui proposta come nuova specie tipo del sottogenere *Paleoblitacythereis*. Una forma considerata nuova per la letteratura, *Oblitacythereis* (*Paleoblitacythereis*) *apula* n. sp., viene inoltre descritta ed illustrata. Per ciascuna specie sono fornite una sinonimia aggiornata, un attento confronto con le altre specie note, le segnalazioni precedenti e la distribuzione bio-cronostratigrafica nell'ambito delle sezioni esaminate. Vengono, infine, esposte alcune considerazioni sul significato paleoecologico di ciascuna specie.

Abstract. The genus *Oblitacythereis*, type species *Oblitacythereis* (*Oblitacythereis*) *mediterranea* Benson, 1977, and the subgenera *Oblitacythereis* and *Paleoblitacythereis* are well defined by Benson (1977), who designated *Carinocythereis ruggierii* Russo, 1966 as type species of *Paleoblitacythereis*. The specimens figured and described as *Carinocythereis ruggierii* by Benson (1977), however, clearly differ from Russo's species, and coincide well with *Oblitacythereis* sp. 3 Russo & Bossio, 1976, as stated by Bonaduce & Russo (1985). As a consequence of this misidentification the subgenus *Paleoblitacythereis* is subject to uncertainty and potential instability. The type species designated by Benson should be considered as a new nominal species and *Carinocythereis ruggierii* Russo, which actually belongs to *Paleoblitacythereis*, should be revised. The study of well-preserved specimens from some Miocene formations in southern Italy prompts the author to propose herein a systematic revision of the Italian representatives of the subgenus *Paleoblitacythereis*. Three species are discussed. These are: *Oblitacythereis* (*Paleoblitacythereis*) *ruggierii* (Russo, 1966), *Oblitacythereis* (*Paleoblitacythereis*) *bossioi* n. sp. (= *Oblitacythereis* sp. 3 Russo & Bossio, 1976), here proposed as the new nominal type species of *Paleoblitacythereis* and, finally, *Oblitacythereis* (*Paleoblitacythereis*) *apula* n. sp., described as new. The systematic notes of each species are given with the bio-chronostratigraphical distribution resulting from the present study together with some palaeoecological remarks.

Introduction.

The genus *Oblitacythereis*, type species *Oblitacythereis* (*Oblitacythereis*) *mediterranea* Benson, 1977, was erected by Benson (1977), who described its diagnostic features and drew attention to its stratigraphical and palaecological value. According to Benson (1976, 1977, 1978) *Oblitacythereis* is a typical inhabitant of the upper bathyal zone with water temperature ranging from 10°C and 16-20°C and estimated depth range of 300 to 1000 meters. Benson (1977) subdivided *Oblitacythereis* into two subgenera (*Oblitacythereis* Benson, 1977 and *Paleoblitacythereis* Benson, 1977), based on the structure of the anterior reticular system and the development of the three major longitudinal ridges. The original diagnosis of *Paleoblitacythereis* and the designation of its type species are based on Spanish and Sicilian specimens, which were incorrectly attributed by Benson (1977) to *Carinocythereis ruggierii* Russo, 1966 (see detailed discussion in the systematic section). This misidentification produces uncertainty and potential instability in the common usage of *Paleoblitacythereis* (ICZN Art.70) and the type species designated by Benson should be considered as a new nominal species (ICZN Art. 70, c).

Since *Paleoblitacythereis* is of considerable palaeoecological and stratigraphical significance for the Mediterranean Miocene, a critical taxonomic revision of its Italian representatives is herein presented. Three species are discussed, of which two are proposed as new. For each species an updated synonymy, detailed comparison with allied species, the bio-chronostratigraphical

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distribution in the examined sections, and the previous records are given. Their palaeoecological significance is also briefly discussed.

Material.

The present study is based on some Miocene sections from the Tremiti Islands (Northern Margin of the Apulian Platform) and the Hyblean Plateau (South-Eastern Sicily). The material used in this paper was dated by both planktonic Foraminifera and calcareous nannoplancton. The planktonic foraminiferal zonal scheme followed herein is that of Iaccarino & Salvatorini (1982) and Iaccarino (1985), recently emended for the Middle Miocene by Foresi et al. (1998).

Ten sections from the Miocene sedimentary sequence of the Tremiti Islands, comprising the Cretaccio Formation (Selli, 1971) and the Calcari di S. Nicola Formation (Selli, 1971), have been examined for the present study. They are those studied and described by Iaccarino et al. (in progress), to whom the present author refers for a detailed description of lithology and chrono-biostratigraphy. The investigated sequence ranges from lower Langhian (*Praeorbulina glomerosa* s. l. Zone) to Messinian (*non-distinctive* Zone).

The Sicilian material comes from four Miocene sections comprising the Irminio Member of the Ragusa Formation (Rigo & Barbieri, 1959) and the lower part of the Tellaro Formation (Rigo & Barbieri, 1959). The examined sections are entirely of Langhian age and extend from the *Praeorbulina glomerosa sicana* Subzone to the base of the *Orbulina universa* Subzone (Dall'Antonia et al., in progress).

In addition, some material previously collected by A. Bossio as well as samples from the Langhian stratotype have also been examined.

Systematic descriptions.

All the illustrated specimens are housed in the Ostracoda Collection of Prof. A. Bossio (C.O.B. 15-24), Department of Earth Sciences, University of Pisa, Italy. The taxonomic classification and the terminology of the external carapace features followed herein (Fig. 1) are those proposed by Benson (1977). The author refers to Benson (cited op.) for diagnosis and detailed descriptions of the genus *Oblitacythereis* and the subgenera *Oblitacythereis* and *Paleoblitacythereis*.

As a consequence of the above mentioned misidentification by Benson, all the forms reported but not figured as *Oblitacythereis ruggierii* (Russo) by Benson (1976, 1978), Benson et al. (1991) and Berggren et al. (1976), are considered of doubtful attribution and are not dealt with in the present paper.

Family Trachyleberididae Silvester-Bradley, 1948

Subfamily Trachyleberidinae Silvester-Bradley, 1948

Genus *Oblitacythereis* Benson, 1977

Subgenus *Paleoblitacythereis* Benson, 1977

Oblitacythereis (Paleoblitacythereis) apula n. sp.

(Fig. 1a; Pl. 1, fig. 3, 4, 7)

1976 *Oblitacythereis* sp. 1 - Russo & Bossio, p. 220, pl. 1, fig. 7, 7a

Material. More then 70 valves and 10 carapaces.

Etymology. From Latin *apulus/apula* = inhabitant of Apulia.

Holotype. A left valve (C.O.B. 15) figured in Fig. 1a and in Pl. 1, fig. 3, 7.

Type-level. Serravallian (*Neogloboquadrina continuosa* Subzone) of the Cretaccio Formation.

Type-locality. North-eastern area of S. Nicola Island (Tremiti Islands); Section 8 (sample n. 177) in Iaccarino et al. (in progress).

Paratypes. 4 valves and 1 carapace (C.O.B. 16-20), of these a right valve (C.O.B. 16) is figured in Pl. 1., fig. 4.

Diagnosis. A species characterized by strong ornament with a marked coalescence of the *fossae* in the posterior region; the *muri* in the anterior area are poorly developed and a simple transverse rib extends from the position of the absent eye tubercle to the median longitudinal rib, anterior to the position of the frontal scar.

Description. In lateral view the left valve is sub-rectangular, thick-shelled and strongly ornamented. The regularly rounded anterior margin is denticulate, especially in the anteroventral region. The dorsal margin is straight but overhung by the dorsal rib. The ventral margin has a distinct antero-ventral keel. The ventral and dorsal lines slightly converge backward. The posterior extremity is sub-acuminate, with apex at mid height. The posteroventral margin is denticulate. The three typical longitudinal ribs are well-defined. In the posterior region, the *fossae* tend to align horizontally and to join vertically and two subdued, longitudinal secondary ribs are present; a lower one, which divides the *fossae* of N-O series from the *fossae* of the P-V series and an upper one, which separates the *fossae* of K series from the *fossae* of the L-M series. In the anterior area, there are some vestigial parts of the primitive anterior marginal ridge. Nevertheless, a poorly organised system of nodes and short *muri*, which might represent an initial stage on the way toward the formation of the *interoconcentricum* (Benson, 1977, p. 30) is present (Fig. 1). This consists of the following structures: 1) a simple transverse ridge, which joins *pore-conulus Scorpio* to the blind ocular tubercle passing through *pore-conulus Capricornus*; 2) a short oblique and arched rib, separating *fossa* C1-C2 from *fossae* B1 and B2 and connecting *pore-conulus Alfa* to the former transverse rib; 3) a short rib, joining *pore-conulus Alpha* and *pore-conulus Beta* and reaching the median rib.

Internal features typical of the genus.

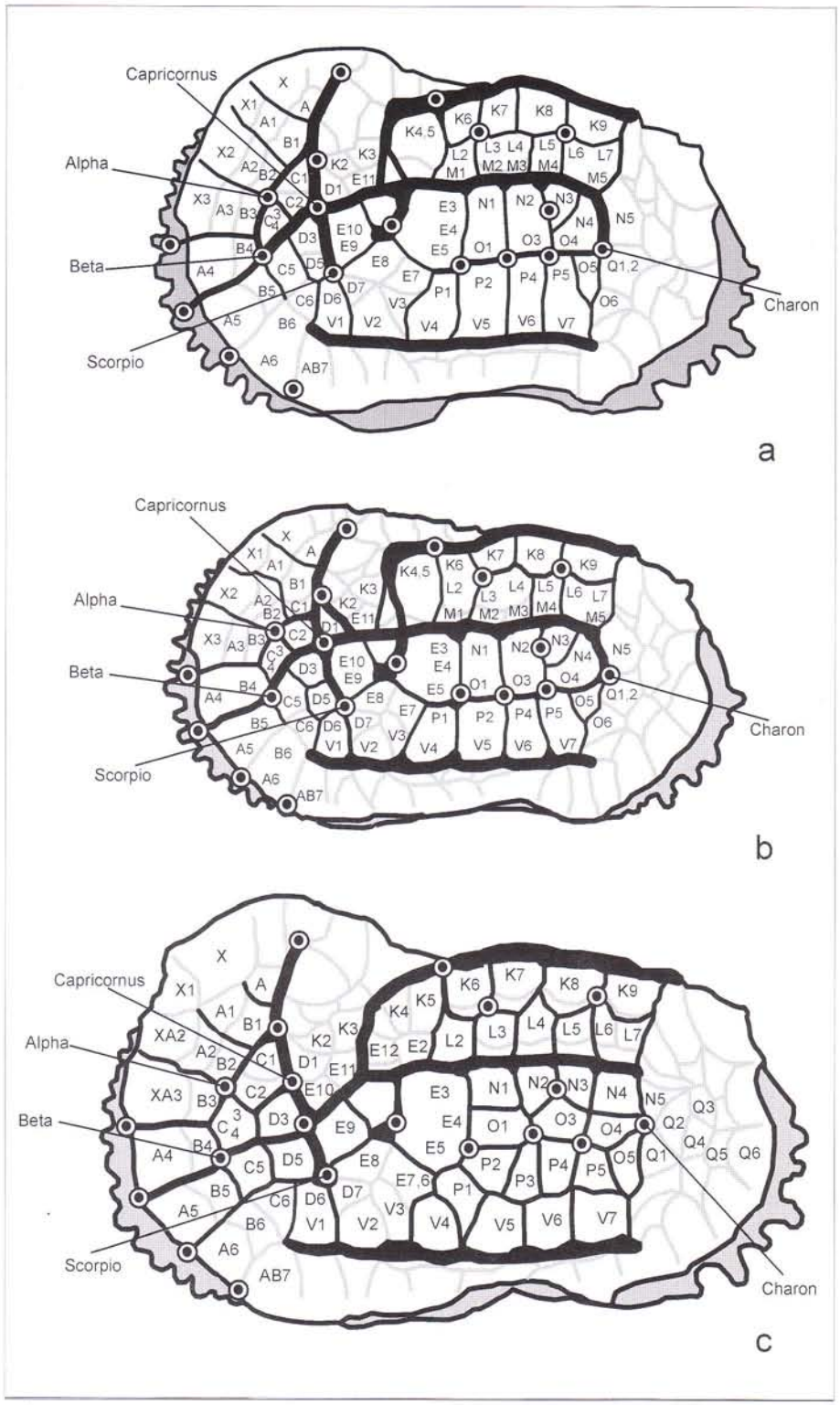


Fig. 1 - Reticular silhouettes and ridge patterns of (a) *Oblitacythereis* (*Paleoblitacythereis*) *apula* n. sp.; (b) *Oblitacythereis* (*Paleoblitacythereis*) *bossioi* n. sp.; (c) *Oblitacythereis* (*Paleoblitacythereis*) *ruggierii* (Russo). The fossal patterns and the positions of some of the main pore-conuli are indicated according to Benson (1972, 1977).

strong ornament and in the tendency of the *fossae* to coalesce. The two species differ in the lateral outline, the former being higher with a prominent antero-ventral keel. They also differ in some details of morphology and distribution of *fossae* postero-dorsally, but mainly in the different arrangement of the ribs and *muri* in the anterior area. In *Oblitacythereis* (*Paleoblitacythereis*) *apula* n. sp. *fossae* D1, K2 and E11 are very depressed and tend to coalesce and a simple transverse rib joins the blind ocular tubercle to *pore-conulus Capricornus*. In *Oblitacythereis* (*Paleoblitacythereis*) *bossioi* n. sp., however, the structure separating *fossa* D1 from *fossae* K2 and E11 is an important feature of the anterior area and the same transverse rib bifurcates before reaching the median rib. Moreover, the two species clearly differ in the morphology of *fossae* C1 and C2 and in the development of the *muri* which define them.

The species figured by Russo & Bossio (1976) as *Oblitacythereis* sp. 1 clearly resembles *Oblitacythereis* (P.) *apula* n. sp. in presence of a completely depressed area just posterodorsal to *pore-conulus Capricornus*. *Oblitacythereis* sp. 1 slightly differs from the present new species, however, only in having *fossae* C1 and C2 not completely coalescent, but distinctly separated. Even though the illustrations given by Russo & Bossio (1976) are not very clear, due to the preservational quality of the figured specimens, a direct examination of the Maltese collection leaves no doubt that the material is conspecific.

Size (in mm).

	Length	Height
Holotype (LV)	0.81	0.50
Figured Paratype (RV)	0.80	0.50
Range of observed specimens	0.76-0.84	0.48-0.52

Remarks. The proposed new species is very similar to *Oblitacythereis* (*Paleoblitacythereis*) *bossioi* n. sp. in its

The present author is conscious that the main differences between *Oblitacythereis* (P.) *apula* n. sp. and *Oblitacythereis* (*P.*) *bossioi* n. sp. are confined to the region around *pore-conulus Capriconus*, adjoining *fossae* D3 and E10. Nevertheless, it must be emphasized that according to Benson (1977, p. 13), this is one of the regions where the major changes in the structural evolution of *Oblitacythereis* seems to be focused. Furthermore, in all the specimens the present author encountered, no gradual passage from one species to the other could be detected.

Previous records.

Aquitanian ("2 th Interval" of Giannelli & Salvatorini, 1972) of the Maltese Archipelago (Russo & Bossio, 1976).

Occurrence in the examined sections. The proposed new species is quite common in the Tremiti Islands, where it occurs rather constantly from the lower Langhian (*Praeorbulina glomerosa sicana* Subzone) to the uppermost Serravallian (top of *Globorotalia menardii* Subzone). It has also been recovered in the lower Langhian (*Praeorbulina glomerosa sicana* Subzone) of the Hyblean Plateau.

Palaeoecological remarks. The species has been reported for the first time from deep thermospheric assemblages of the Maltese Archipelago (Russo & Bossio, 1976). In the sections from the Tremiti Islands the species is well represented in deep associations referable to the Langhian-Serravallian interval. It is present, even if with low values of abundance, also in assemblages characterized by the occurrence of the psychrospheric genus *Agrenocythere* Benson, 1972. According to these data the species seems to have been able to extend down towards the deeper and cooler environments of the psychrosphere.

Oblitacythereis (Paleoblitacythereis) bossioi n. sp.

(Fig. 1b; Pl. 1, fig. 5, 6, 8)

1976 *Oblitacythereis* sp. 3 - Russo & Bossio, p. 221, pl. 2, fig. 1, 2
1977 *Oblitacythereis* (*Paleoblitacythereis*) *ruggierii* - Benson, p. 34, fig. 4c-e, 6a-c; pl. 1, fig. 5, 6, 8; pl. 2, fig. 5-7; pl. 3, fig. 2, 3, 8
1980 *Oblitacythereis* sp. (= *Oblitacythereis* sp. 3 in Russo & Bossio, 1976) - Ciampo, p. 10, pl. 1, fig. 10
1981 *Oblitacythereis* sp. (= *Oblitacythereis* sp. in Ciampo, 1980) - Ciampo, p. 56, 62.

Material. 3 valves and 6 carapaces; of these a left valve (C.O.B. 21) and a right valve (C.O.B. 22) are figured. This material, added to that synonomized above is regarded as sufficient to erect the new taxon.

Size (in mm).

	Length	Height
Range of observed specimens	0.76-0.78	0.43-0.45

Etymology. In honor of Prof. Alessandro Bossio.

Holotype. The right valve (usnm 190878) figured by Benson (1977, pl. 1, fig. 6).

Type-level and Type-locality. Early Langhian of the northwestern area of Sutera (Agrigento, Sicily).

Paratypes. The disarticulated valves figured by Benson (1977, pl. 1, fig. 5, 8; pl. 2, fig. 5-7; pl. 3, fig. 2, 3, 8) from the Miocene of Spain and Sicily.

Diagnosis. As for Benson (1977, p. 34).

Description. As for Benson (197, p. 34).

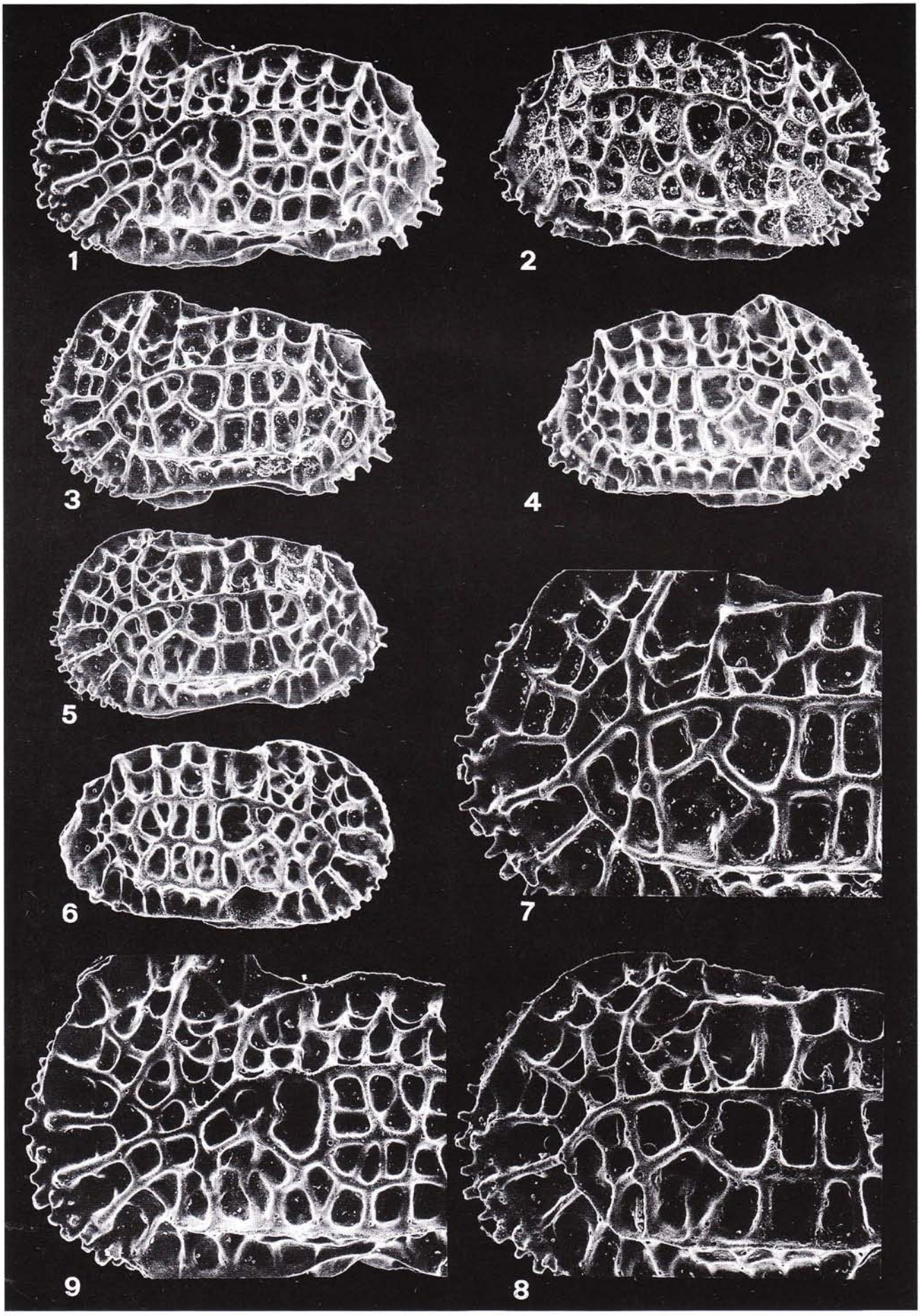
Remarks. The species has been illustrated but not described as *Oblitacythereis* sp. 3 Russo & Bossio (1976), from the upper Langhian-Serravallian of the Maltese Archipelago. Benson (1977) described and figured it as type species of the subgenus *Paleoblitacythereis* but erroneously referred it to *Carinocythereis ruggierii* Russo, 1966. According to Benson, his attribution was based on a previous identification by Ruggieri (cited in Benson, 1977, p. 34, as personal comm.), who misapplied Russo's (1966) nominal species. Later, Ciampo (1980) figured it from the Tortonian of the Hyblean Plateau and mentioned Benson's incorrect attribution. Finally, Bonaduce & Russo (1985) confirmed Ciampo's affirmation and stated that "The specimens described by Benson as *P. ruggierii* are identical to those illustrated by Russo & Bossio (1976) and by Ciampo (1980) as *Oblitacythereis* (*Paleoblitacythereis*) sp. 3, that probably are a new species". As Ciampo (1980) noted, *Carinocythereis* ruggierii Russo and *Oblitacythereis* sp. 3 Russo & Bossio are quite different in their reticular silhouettes and fossal patterns. The latter is, in fact, more massive and characterized by a simpler reticular pattern with a marked fusion of the *fossae* in the posterior region. Moreover, the anterior structure of *Oblitacythereis* sp. 3 is more disordered and primitive, almost completely lacking the interoconcentricum (Fig. 1). For detailed comparison with *Oblitacythereis* (*Paleoblitacythereis*) *apula* n. sp. (this paper) see under that species.

PLATE 1

Fig. 1, 2, 9 - *Oblitacythereis* (*Paleoblitacythereis*) *ruggierii* (Russo); Tremiti Islands, Serravallian. 1: Left valve, C.O.B. 23, x 80. 2: Right valve, C.O.B. 24, x 80. 9: Detail of the anterior area, same specimen of Fig. 1 C.O.B. 23, x 110.

Fig. 3, 4, 7 - *Oblitacythereis* (*Paleoblitacythereis*) *apula* n. sp.; Tremiti Islands, Serravallian. 3: Left valve, Holotype C.O.B. 15, x 80. 4: Right valve, Paratype C.O.B. 16, x 80. 7: Detail of the anterior area, same specimen of Fig. 3 C.O.B. 15, x 150.

Fig. 5, 6, 8 - *Oblitacythereis* (*Paleoblitacythereis*) *bossioi* n. sp.; Hyblean Plateau, Langhian. 5: Left valve, C.O.B. 21, x 80. 6: Right valve, C.O.B. 22, x 80. 8: Detail of the anterior area, same specimen of Fig. 5 C.O.B. 21, x 150.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As there is no doubt as to the identity of the form designated by Benson (1977) as type species of the subgenus *Paleoblitacythereis*, the present author proposes *Oblitacythereis* (*Paleoblitacythereis*) *bossioi* n. sp. (= *Oblitacythereis* sp. 3 Russo & Bossio) as the new nominal type species of *Paleoblitacythereis*.

Previous records.

Upper Langhian-Serravallian ("middle-upper part of the 6th Interval and 7th-8th Intervals" of Giannelli & Salvatorini, 1975) of the Maltese Archipelago (Russo & Bossio, 1976).

Lower Langhian-Tortonian of Sicily and Tortonian-Messinian of Andalusia (Benson, 1977).

Serravallian and Tortonian (*Globorotalia acostaensis acostaensis* Zone sensu D'Onofrio et al., 1975) of the Ragusa Area, Hyblean Plateau (Ciampo, 1980, 1981).

Occurrence in the examined sections. This species occurs in scattered samples only in the lower Langhian (*Praeorbulina glomerosa* s. l. Zone) of the Hyblean Plateau.

Palaeoecological notes. In the Hyblean Plateau *Oblitacythereis* (*P.*) *bossioi* n. sp. occurs in typical deep thermospheric associations and also, although always represented by few specimens, in assemblages characterized by the presence of the psychrospheric genus *Agrenocythere*. In the literature it is mainly reported from thermospheric associations. The available data, although not highly significant and its strong affinity with *Oblitacythereis* (*P.*) *apula* n. sp. support the supposition that this species might have lived in a wider bathymetric and thermal range then that typical of the lower thermosphere.

Oblitacythereis (Paleoblitacythereis) ruggierii

(Russo, 1966)

(Fig. 1c; Pl. 1, fig. 1, 2, 9)

1961 *Bradleya* sp. - Oertli, p. 28, pl. 5, fig. 47
1966 *Carinocythereis ruggierii* - Russo, p. 242, pl. 44, fig. 4; pl. 45, fig. 1, 2a-b
? 1969 *Bradleya* (?) sp. - Russo, p. 23, pl. 2, fig. 7a-b
non 1976 *Oblitacythereis ruggierii* - Berggren, Benson, Hag, Riedel, Sanfilippo, Schrader & Tjaslsma, p. 224, pl. 6, fig. 5
1976 *Oblitacythereis ruggierii* - Russo & Bossio, p. 220, pl. 1, fig. 4
non 1977 *Oblitacythereis* (*Paleoblitacythereis*) *ruggierii* - Benson, p. 34, fig. 4c-e, 6a-c; pl. 1, fig. 5, 6, 8; pl. 2, fig. 5-7; pl. 3, fig. 2, 3, 8
1985 *Paleoblitacythereis ruggierii* - Bonaduce & Russo, p. 430, pl. 3, fig. 4a-c

Material. More then 50 valves and 8 carapaces, of these a left valve (C.O.B. 23) and a right valve (C.O.B. 24) are figured.

Size (in mm).

	Length	Height
Range of observed specimens	0.86-0.94	0.50-0.58

Remarks. *Carinocythereis ruggierii* Russo, 1966 has been reported from the Middle Miocene of various Italian localities. However, it has never been either clearly illustrated by previous authors (owing to the poor state of preservation of the material at their disposal) or compared with the other representatives of the genus.

The examination of well preserved material allowed the present author to reveal a surprising affinity between Russo's species and *Oblitacythereis* (*Oblitacythereis*) *mediterranea* Benson (1977, p. 33, fig. 3, 4a, 5b; pl. 1, fig. 1-4; pl. 3, fig. 1). They are very close in terms of their general slender aspect and the organization of the *reticulum* (Fig. 1). Despite this similarity, *Carinocythereis ruggierii* Russo must truly be assigned to *Paleoblitacythereis*, as suggested by Bonaduce & Russo (1985), due to the following features: 1) the basic pattern of the *interoconcentricum* is present, but it is discontinuous and does not form a separate structure from the rest of the reticular *muri*; the three small ribs extending distally from the *interoconcentricum* to the anterior outer margin are poorly developed and the whole reticulum of the anterior area is rather depressed; 2) the three longitudinal major ribs are not ponticulate as in *Oblitacythereis* (*O.*) *mediterranea* and there is very little difference in height between them and the underlying *mural* network.

Russo's species differs from *Oblitacythereis* (*O.*) *mediterranea* Benson also in its different lateral outline, the former being less elongate with a more arched longitudinal dorsal rib, a less sinuous ventral margin and a tendency to expansion of the anterior cardinal area. Moreover, in *Oblitacythereis* (*Paleoblitacythereis*) *ruggierii fossae* C1-C2 are not completely coalescent, being separated by a low, but well-defined structure.

As previously discussed, the form described and illustrated by Benson (1977) as *Oblitacythereis* (*Paleoblitacythereis*) *ruggierii* (Russo) is not conspecific with Russo's species and is herein described as *Oblitacythereis* (*Paleoblitacythereis*) *bossioi* n. sp.. The right valve illustrated by Berggren et al. (1976) as *Oblitacythereis ruggierii* (Russo), from the El Cuervo Section belongs neither to *Oblitacythereis* (*Paleoblitacythereis*) *bossioi* n. sp. nor *Oblitacythereis* (*Paleoblitacythereis*) *ruggierii* (Russo). In 1977 Benson himself figured a left valve from the El Cuervo Section and assigned it to another species which he left in open nomenclature. Although Benson (1977) did not mention any relationship between this form and the one previously figured from the same section, they clearly belong to the same species. The El Cuervo form differs from *Oblitacythereis* (*Paleoblitacythereis*) *bossioi* n. sp. in its different lateral outline, the former being stockier with a higher height/length ratio, and also in the clearly different distribution of the anterior *fossae* and *muri*. From *Oblitacythereis* (*Paleoblitacythereis*) *ruggierii* (Russo) it differs

in its more massive appearance and the more obvious fusion of the posteromedian *fossae*. In the present author's opinion the form figured and described by Russo (1969) as *Bradleya (?)* sp. may possible be referable to *Oblitacythereis (P.) ruggierii*, nevertheless the available illustrations do not allow a firm attribution.

Previous records.

Aquitanian-Burdigalian (from NN1 to NN4 nannofossil Zone *sensu* Martini, 1971) of Sardinia (Bonaduce & Russo, 1985).

Burdigalian ("3th Interval" of Giannelli & Salvatorini, 1972) of the Maltese Archipelago (Russo & Bossio, 1976).

Langhian of the Langhian stratotype (Oertli, 1961) and the Northern Apennines (Russo, 1966).

Tortonian of the Northern Apennines (Russo, 1969, questionable presence).

Occurrence in the examined sections. The species occurs in the Tremiti Islands from the lower Langhian (*Praeorbulina glomerosa sicana* Subzone) to the Tortonian (*Globigerinoides extremus- Globigerinoides obliquus* Subzone), with a wide gap in its distribution from the upper part of *Praeorbulina glomerosa sicana* Subzone to the lower part of *Globorotalia praemenardii-Globorotalia peripheroronda* Subzone.

Palaeoecological notes. On the basis of the studied sections the species is common in deep thermospheric assemblages, while it is poorly represented or absent in associations characterized by the occurrence of the psychrospheric genus *Agrenocythere*. In the literature *Oblitacythereis (O.) ruggierii* has never been reported with certainty (see introduction to systematic descriptions) associated with psychrospheric ostracods. This evidence supports the supposition that this species was a typical inhabitant of thermospheric waters and was probably not able to survive in colder and deeper environments.

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REFERENCES

Benson H. R. (1972) - The *Bradleya* Problem, with Description of Two New Psychrospheric Ostracode Genera, *Agrenocythere* and *Poseidonamicus* (Ostracoda: Crustacea). *Smithsonian Contr. Paleobiol.*, v. 12, 138 pp., Washington.

Benson H. R. (1976) - Miocene deep-sea Ostracodes of the Iberian Portal and the Balearic Basin. *Mar. Micropal.*, v. 1, pp. 249-262, Amsterdam.

Benson H. R. (1977) - Evolution of *Oblitacythereis* from *Paleocosta* (Ostracoda: Trachyleberididae) during the Cenozoic in the Mediterranean and Atlantic. *Smithsonian Contr. Paleobiol.*, v. 33, 47 pp., Washington.

Benson H. R. (1978) - The paleoecology of the Ostracodes of DSDP Leg 42 A. *Initial Reports. DSDP*, v. 42, n. 1, pp. 777-787, (U. S. Governement Printing Office) Washington.

Benson R. H., Rakic El Bied K. & Bonaduce G. (1991) - An important current reversal (influx) in the Rifian Corridor (Morocco) at the Tortonian-Messinian boundary: the end of the Tethys. *Ocean. Paleocean.*, v. 6, n. 1, pp. 164-192, Washington.

Berggren W. A., Benson R. H., Hag B. U., Riedel W. R., Sanfilippo A., Schrader H. J. & Tjaslsma R. C. (1976) - The El Cuervo section (Andalusia, Spain): Micropaleontologic anatomy of an Early Late Miocene lower bathyal deposit. *Marine Micropal.*, v. 1, pp. 195-218, Amsterdam.

Bonaduce G. & Russo A. (1985) - The Miocene Ostracodes of Sardinia. *Boll. Soc. Paleont. Ital.*, v. 23, pp. 421-437, Modena.

Ciampo G. (1980) - Ostracodi miocenici (Tortoniano-Messiniano) della regione di Ragusa (Sicilia). *Boll. Soc. Paleont. Ital.*, v. 19, pp. 5-20, Modena.

Ciampo G. (1981) - Ostracodi fossili (Oligocene superiore-Serravalliano) del Monte Cammarata (Sicilia centro-occidentale) & del Ragusano (Sicilia sud-orientale). *Boll. Soc. Paleont. Ital.*, v. 20, pp. 53-72, Modena.

Dall'Antonia B., Di Stefano A., Foresi L. M. (in progress) - Integrated micropalaeontological study (ostracods and calcareous plankton) of the Langhian western Hyblean successions.

D'Onofrio S., Giannelli L., Iaccarino S., Morlotti E., Romeo M., Salvatorini G., Sampò M. & Sprovieri R. (1975) – Planktonic Foraminifera of the Upper Miocene from some Italian sections and the problem of the lower boundary of the Messinian. *Boll. Soc. Paleont. Ital.*, v. 14, pp. 177-196, Modena.

Foresi L.M., Iaccarino S., Mazzei R. & Salvatorini G. (1998) - New data on Middle to Late Miocene calcareous plankton biostratigraphy in the mediterranean area. *Riv. Ital. Paleont. Strat.*, v. 104, pp. 95-114, Milano.

Giannelli L. & Salvatorini G. (1972) - I foraminiferi planctonici dei sedimenti terziari dell'Arcipelago Maltese. I. Biostratigrafia del "Globigerina Limestone". *Atti Soc. Tosc. Sc. Nat., Mem.*, Ser. A, v. 79, pp. 49-74, Pisa.

Giannelli L. & Salvatorini G. (1975) - I foraminiferi planctonici dei sedimenti terziari dell'Arcipelago Maltese. II. Biostratigrafia di "Blue Clay", "Greensands" e "Upper Coralline Limestone". *Atti Soc. Tosc. Sc. Nat., Mem.*, Ser. A, v. 82, pp. 1-24, Pisa.

Iaccarino S. (1985) - Mediterranean Miocene and Pliocene planktic foraminifera. In Bolli, H. M., Saunders, J. B. & Perch-Nielsen, K. (Eds.) - Plankton Stratigraphy, pp. 283-314, Cambridge University Press.

Iaccarino S., Foresi L. M., Mazzei R. & Salvatorini G. (in progress) - Calcareus plankton biostratigraphy of the Miocene sediments of the Tremiti Islands.

Iaccarino S. & Salvatorini G. (1982) - A framework of planktonic foraminiferal biostratigraphy for Early Miocene to Late Pliocene Mediterranean area. *Paleont. Stratigr. Evol.*, v. 2, pp. 115-125, Roma

International Commission on Zoological Nomenclature (1985) - International Code of Zoological Nomenclature. *International Trust for Zoological Nomenclature*, pp. 1-338, London.

Martini E. (1971) - Standard and Tertiary and Quaternary calcareous nannoplankton zonation. *Proc. 2th Plankt. Confer.*, v. 2, pp. 739-785, Roma.

Oertli H. J. (1961) - Ostracodes du Langhien-type. *Riv. Ital. Paleont. Strat.*, v. 67, pp. 17-44, Milano.

Rigo M. & Barbieri F. (1959) - Stratigrafia pratica applicata in Sicilia. *Boll. Serv. Geol. It.*, v. 80, pp. 351-441, Roma.

Russo A. (1966) - Ostracodi langhiani del Pescale (Appennino settentrionale modenese). *Boll. Soc. Paleont. It.*, v. 3, pp. 227-251, Modena.

Russo A. (1969) - Ostracodi Tortoniani di Montebaranzone (Appennino settentrionale modenese). *Boll. Soc. Paleont. It.*, v. 7, pp. 6-56, Modena.

Russo A. & Bossio A. (1976) - Prima utilizzazione degli Ostracodi per la biostratigrafia e la paleoecologia del Miocene dell'Arcipelago Maltese. *Boll. Soc. Paleont. It.*, v. 15, pp. 215-227, Modena.

Selli R. (1971) - Isole Tremiti e Pianosa. Note illustrative della Carta Geologica d'Italia alla scala 1:100.000. Foglio 156 "S. Marco in Lamis". *Serv. Geol. Ital.* Roma.

Sylvester-Bradley P. C. (1948) - The ostracod genus *Cythereis*. *Journ. Paleont.*, v. 22, pp. 792-797, Tulsa.