REVISIO THE OSTRACODE
SUBGENUS PALEOBLITACYTHEREIS BENSON, 1977

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Taxonomy, Miocene, Southern Italy.

Introduction.

The genus Oblitacythereis, type species Oblitacythereis (Obliti-
cythereis) mediterranea Benson, 1977, was erected by Benson (1977),
who described its diagnostic features and drew attention to its stratigraphical
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, 1987), based on the
structure of the anterior reticular system and the development of the 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 ruggerii 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 palaeo-
cological 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
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 nannoplankton. The planktonic foraminiferal zonal scheme followed herein is that of Iaccarino & Salvatorini (1982) and Iaccarino (1985), recently emended for the Middle Miocene by Forresi et al. (1998).

Ten sections from the Miocene sedimentary sequence of the Tremiti Islands, comprising the Creataceous Formation (Selli, 1971) and the Calcaro 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 chronostratigraphy. The investigated sequence ranges from lower Langhian (Praeorbula glomerosa s.l. Zone) to Messinian (non-distinctive Zone).

The Sicilian material comes from four Miocene sections comprising the Irimino 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 Praeorbula glomerosa sicana Subzone to the base of the Orbignina univenter 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 Oblityacythereis and the subgenera Oblityacythereis and Paleoblityacythereis.

As a consequence of the above mentioned misidentification by Benson, all the forms reported but not figured as Oblityacythereis ruggerieri (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 Silvestri-Bradley, 1948
Subfamily Trachyleberidinae Silvestri-Bradley, 1948
Genus Oblityacythereis Benson, 1977
Subgenus Paleoblityacythereis Benson, 1977

Oblityacythereis (Paleoblityacythereis) apula n. sp.

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

1976 Oblityacythereis sp. 1 - Russo & Bossio, p. 226, pl. 1, fig. 7, 7a

Material. More than 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. Neogloboquadrina contusina Subzone of the Cretaceous Formation.

Type-locality. North-eastern area of S. Nicola Island (Tremiti Islands); Section 8 (sample no. 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.
The proposed new species is very similar to *Oblitacythereis (Paleoblitacythereis) bossioi* n. sp. in its 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 postero-dorsal 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).

<table>
<thead>
<tr>
<th>Description</th>
<th>Length</th>
<th>Height</th>
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<tbody>
<tr>
<td>Holotype (LV)</td>
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<td>0.50</td>
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<tr>
<td>Figured Paratype (RV)</td>
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<td>0.50</td>
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<tr>
<td>Range of observed specimens</td>
<td>0.76-0.84</td>
<td>0.48-0.52</td>
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**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 *Capricornus*, 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.**


**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 psychospheric 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 psychosphere.

**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) ruggerii* - Benson, p. 34, fig. 4e-8, 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, 1982) - 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 synonymized above is regarded as sufficient to erect the new taxon.

**Size (in mm).**

<table>
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<th>Range of observed specimens</th>
<th>Length</th>
<th>Height</th>
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<tbody>
<tr>
<td>0.76-0.78</td>
<td>0.43-0.45</td>
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</table>

**Etymology.** In honor of Prof. Alessandro Bossio.

**Holotype.** The right valve (usnm 190875) figured by Benson (1977, pl. 1, fig. 6).

**Type-level and Type-locality.** Early Langhian of the north-western 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 (1977, 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 ruggerii* 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. ruggerii* 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 ruggerii* Russo and *Oblitacythereis* sp. 3 Russo & Bossio are quite different in their reticular silhouettes and fossa 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.
The ostracod *Paleoblithycintheris*
As there is no doubt as to the identity of the form designated by Benson (1977) as type species of the subgenus Paleoblitacybereis, the present author proposes Oblitacybereis (Paleoblitacybereis) bossioi n. sp. (= Oblitacybereis sp. 3 Russo & Bossio) as the new nominal type species of Paleoblitacybereis.

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).


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

Paleoecological notes. In the Hyblean Plateau Oblitacybereis (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 Agencycythebe. In the literature it is mainly reported from thermospheric associations. The available data, although not highly significant and its strong affinity with Oblitacybereis (P.) apula n. sp. support the suggestion that this species might have lived in a wider bathymetric and thermal range than that typical of the lower thermosphere.

Oblitacybereis (Paleoblitacybereis) ruggieri (Russo, 1966)
(Fig. 1c; Pl. 1, fig. 1, 2, 9)

1961 Bradley sp. - Oerli, p. 28, pl. 5, fig. 47
1966 Carinocythereis ruggieri - Russo, p. 242, pl. 44, fig. 4; pl. 45, fig. 1, 2a-b
? 1969 Bradley sp. - Russo, p. 23, pl. 2, fig. 7a-b
1976 Oblitacybereis ruggerii - Berggren, Benson, Hag, Riedel, Santillips, Schrader & Tissina, p. 224, pl. 5, fig. 2
1976 Oblitacybereis ruggerii - Russo & Bossio, p. 225, pl. 1, fig. 4
1977 Oblitacybereis (Paleoblitacybereis) ruggerii - Benson, p. 34, fig. 4c-c, 6a-c, pl. 1, fig. 5, 6, 8; pl. 2, fig. 7-b, pl. 3, fig. 2, 3, 8
1985 Paleoblitacybereis ruggerii - Bonaduce & Russo, p. 432, pl. 3, fig. 4a-c

Material. More than 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).

<table>
<thead>
<tr>
<th>Range of observed specimens</th>
<th>Length</th>
<th>Height</th>
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<tbody>
<tr>
<td>0.86-0.94</td>
<td>0.50-0.58</td>
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Remarks. Carinocythereis ruggieri 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 Oblitacybereis (Oblitacybereis) 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 ruggieri Russo must truly be assigned to Oblitacybereis, as suggested by Bonaduce & Russo (1985), due to the following features: 1) the basic pattern of the interconcentricum 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 interconcentricum 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 in any Oblitacybereis (O.) mediterranea and there is very little difference in height between them and the underlying mural network.

Russo's species differs from Oblitacybereis (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 Oblitacybereis (Paleoblitacybereis) ruggerii 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 Oblitacybereis (Paleoblitacybereis) ruggerii (Russo) is not conspecific with Russo’s species and is herein described as Oblitacybereis (Paleoblitacybereis) bossioi n. sp. The right valve illustrated by Berggren et al. (1976) as Oblitacybereis ruggerii (Russo), from the El Cuervo Section belongs neither to Oblitacybereis (Paleoblitacybereis) bossioi n. sp. nor Oblitacybereis (Paleoblitacybereis) ruggerii (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 Oblitacybereis (Paleoblitacybereis) 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 Oblitacybereis (Paleoblitacybereis) ruggerii (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 possibly be referable to Oblitacythereis (P.) ruggerii, nevertheless the available illustrations do not allow a firm attribution.

Previous records.

Aquitanian-Burdigalian (from NN1 to NN4 nanofossil Zone sensu Martini, 1971) of Sardinia (Bonaduce & Russo, 1983).


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 praemenuardii-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 psychospheric genus Agrenocythere. In the literature Oblitacythereis (O.) ruggerii has never been reported with certainty (see introduction to systematic descriptions) associated with psychospheric 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.

Acknowledgements.

The Author is grateful to Prof. A. Russo and Prof. G. Bonaduce for their useful suggestions and critical reading. I am deeply indebted to Prof. A. Bossio for provision of the material and for his invaluable support. Special thanks are expressed to Prof. R. C. Whalley and Prof. G. Ciampo for their constructive reviews of the manuscript.

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