

***Archaeosepta platierensis* Wernli, 1970 (Foraminiferida)
from the Middle Jurassic near Mt Boragine (north-eastern Latium)
and taxonomic position of the genus *Archaeosepta* Wernli, 1970**

Maurizio Chiocchini & Anna Mancinelli

Dipartimento Scienze della Terra, Università degli Studi di Camerino,

Via Gentile III da Varano, 62032 Camerino (MC) (Italy)

ABSTRACT - *Archaeosepta platierensis* Wernli 1970 (Foraminiferida) is for the first time found in the central Apennines; it occurs in the Middle Jurassic limestones of a pelagic-detrital section at Mt Caramano, near Mt Boragine (north-eastern Latium, central Italy).

At present, *Archaeosepta platierensis*, a valuable biostratigraphical and paleoenvironmental marker, is known in Italy only from the Middle Jurassic of north-eastern Sardinia and the Isle of Capri.

The taxonomic position of the genus *Archaeosepta* Wernli, 1970 is discussed and its attribution to the family Abriolinidae Zaninetti & Rettori, 1992 is proposed.

KEY WORDS: Foraminiferida, biostratigraphy, systematics, Jurassic.

INTRODUCTION

Archaeosepta platierensis Wernli, 1970, a small and uncommon benthic foraminifer, has been found in some pelagic-detrital Mesozoic sections outcropping in north-eastern Latium and in Abruzzo.

This foraminifer is an important biostratigraphical, paleogeographical and paleoenvironmental marker; it is the type species of the monotypic genus *Archaeosepta* described by Wernli (1970) from the Late Bajocian-Bathonian of the southern Swiss Jura Mountains.

Later, Septfontaine (1978 a) found *Archaeosepta platierensis* in the Jurassic of "Préalpes"; it occurs in a "typical association restricted to the edge (threshold facies) of a carbonate platform in an environment of high energy, very shallow water and normal salinity".

Moreover, according to the same author, *Archaeosepta platierensis* may occur, in the "domaine à *Cancellophycus interne*", but it is surely transported in the "domaine à *Cancellophycus externe*".

More recently *Archaeosepta platierensis* has been found also in the Early Bathonian of north-eastern Sardinia by Dieni & Massari (1985) and in the Bajocian-Bathonian of the Isle of Capri by Barattolo & Pugliese (1987).

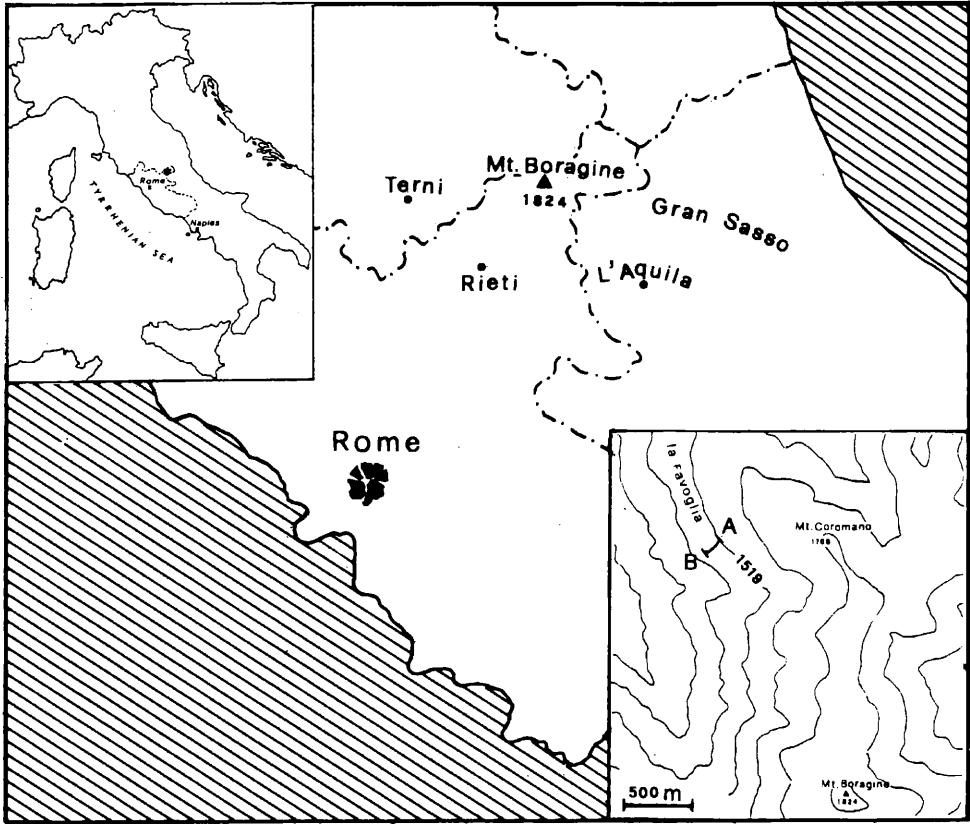


Fig. 1 - Location map and detail of the analysed stratigraphical section.

THE MT. CARAMANO SECTION

Archaeosepta platierensis was found in a pelagic-detrital stratigraphical section cropping out along the western slope of Caramano Mountain, in north-eastern Latium (fig. 1).

The section, about 40 m thick (fig. 2), is characterized by an alternation of finely biotrital, sometimes laminated biomicrites 0. 20-0. 40 m thick, and detrital and biotrital packstones 0. 30-1. 50 m thick; near the top the biotrital packstones prevail and chert nodules appear.

These sediments were deposited in the outer talus of the Apennine Platform (*sensu* Mostardini & Merlini, 1986) of the Latium-Abruzzo area, where during the Jurassic and Cretaceous a lot of clastic and bioclastic material derived from the marginal areas of the same platform was accumulated. Allochthonous skeletal grains can be considered synchronous because derived from unconsolidated carbonates; therefore they are coeval with the associated pelagic fossils (Chiocchini & Mancinelli, 1978; Chiocchini *et al.*, 1995). In the Caramano section, the detrital grains are mostly ooids or micritic peloids with arenitic or less frequently ruditic size.

In the assemblage there are also many kinds of “filaments” (sometimes densely packed and bedding-parallel) Nodosariidae, *Globochaete alpina* Lombard, *Spirillina* sp., ostracodes, rare radiolarians and sponge spicules.

The allochthonous microfossils, derived from the edge of the platform, sometimes forming nuclei of ooids, are: fragments of echinoids, molluscs and reef builders, *Siphovalvulina variabilis* Septfontaine, *Nubecularia reicheli* Rat, Miliolidae, Ophthalmidiidae, *Neotrocholina* sp., Algae aff. *Girvanella*. In addition *Protopenneroplis striata* Weinschenk, *Archaeosepta platierensis* Wernli, ?*Conicospirillina basiliensis* Mohler, *Trocholina palastiniensis* Henson, *Trocholina sagittaria* Arnaud-Vanneau, Boisseau & Darsac, *Trocholina gigantea* Pelissié & Peybernés, *Gaudryina* sp., *Valvulina* sp. cf. *V. lugeoni*, *Patellina* sp., *Ammobaculites* sp. appear in the upper portion of the section.

Because of the lack of index fossils the age of the examined section cannot be precisely established; nevertheless the abundance of “filaments” and the scarcity of radiolarians allow us to correlate the above described section with the upper portion of the “Calcare marne a Posidonia” pelagic unit of the Late Bajocian-Bathonian (Centamore *et al.*, 1970; Boumgartner, 1984, 1987; Cecca *et al.*, 1990).

The presence of biotrital limestones with abundant beds and chert nodules, which discontinuously crops out over the top of the examined section, confirms such age; in fact these limestones containing rich Radiolarians assemblages, can be correlated with the “Calcare diasprini” pelagic unit of the Callovian-Kimmeridgian (Centamore *et al.*, 1970; Boumgartner, 1984, 1987; Cresta *et al.*, 1989; Cecca *et al.*, 1990).

The presence of *Protopenneroplis striata* Weinschenk, ?*Conicospirillina basiliensis* Mohler, *Trocholina gigantea* Pelissié & Peybernés and *Nubecularia reicheli* Rat among the allochthonous fossils, also confirms this age. These benthic fossils in fact appear, not transported, in the marginal areas of the Apennine Platform during the same interval (Chiocchini & Mancinelli, 1977; 1978; 1979; Chiocchini *et al.*, 1995).

This would confirm the age indicated by Wernli (1970) for *Archaeosepta platierensis* in the type locality and by Septfontaine (1978, 1980) in the “Préalpes”.

Further researches to find *Archaeosepta platierensis* not resedimented in the central Apennines, are carrying out on some marginal carbonate sections in the Mt. Giano area, about 15 km south of Mt. Boragine. This area is the most probable source of the biotrital Jurassic resedimented material.

PALAEONTOLOGY

The first occurrence of *Archaeosepta platierensis* in the central Apennines allows us to compare this genus with the similar genus *Abriolina* Luperto, 1963 from the Triassic.

This has been possible because L. Zaninetti and R. Rettori have kindly provided us same samples of similar lithology from the “Monte Facito Formation” (Potenza, southern Italy), which contain *Abriolina mediterranea* Luperto, 1963, the type species and only known species of the genus *Abriolina*.

This genus was originally found in the Permian and attributed to the family Nodosariidae by Luperto (1963, 1965).

In Loeblich & Tappan (1988), *Abriolina* is included in the “Foraminiferal Genera of Uncertain Status”, although it might belong to the Biseriamminidae.

Abriolina was a poorly known genus until 1992, then Zaninetti & Rettori (in: Zaninetti

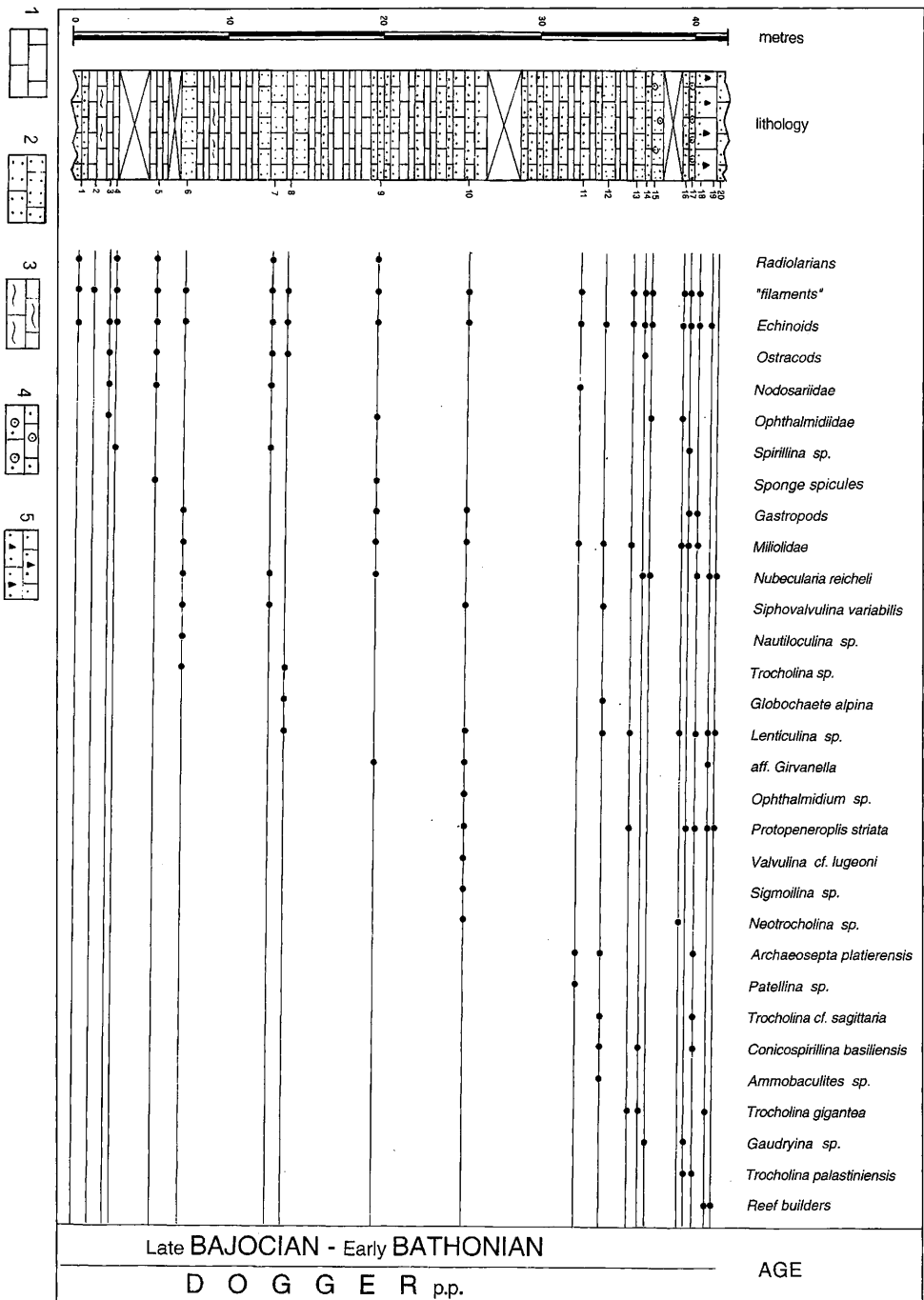


Fig. 2 - The Mt. Caramano stratigraphical section: lithology and distribution chart of fossils. 1) mudstones; 2) detrital grainstones; 3) laminated mudstones; 4) detrital grainstones with ooids; 5) detrital grainstones with chert nodules.

et al., 1992) described it again in Triassic sediments, showing better illustrations. The same authors considered it the type genus of the new family Abriolinidae.

As *Archaeosepta*, this genus has not been originally included in any family by Wernli (1970).

Septfontaine (1978 a), found *Archaeosepta platierensis* in different facies of the southern Jura and "Préalpes" and suggested that the genus *Archaeosepta* could be attributed to the superfamily Endothyracea Brady, 1884, together with other Mesozoic Foraminifera structurally wall complex. According to the same author, these genera could represent the descendants of the Late Paleozoic Foraminifera with double wall.

Concerning the family attribution of *Archaeosepta*, Septfontaine (1978 b) thinks a new family has to be erected for each of these Mesozoic genera, morphologically very isolated. It appears artificial to group all the Mesozoic genera with a double wall in the same family Archaeoseptidae.

In Loeblich & Tappan (1988), the genus *Archaeosepta*, though with a nonlamellar wall, is included in the family Ventrolaminidae Weynschenk (1950), together with *Protopenneroplis* Weynschenk which shows a typical lamellar wall (Farinacci, 1964; Septfontaine, 1974).

The comparison between *Archaeosepta* and *Abriolina* (fig. 3) shows that these genera share the following characters:

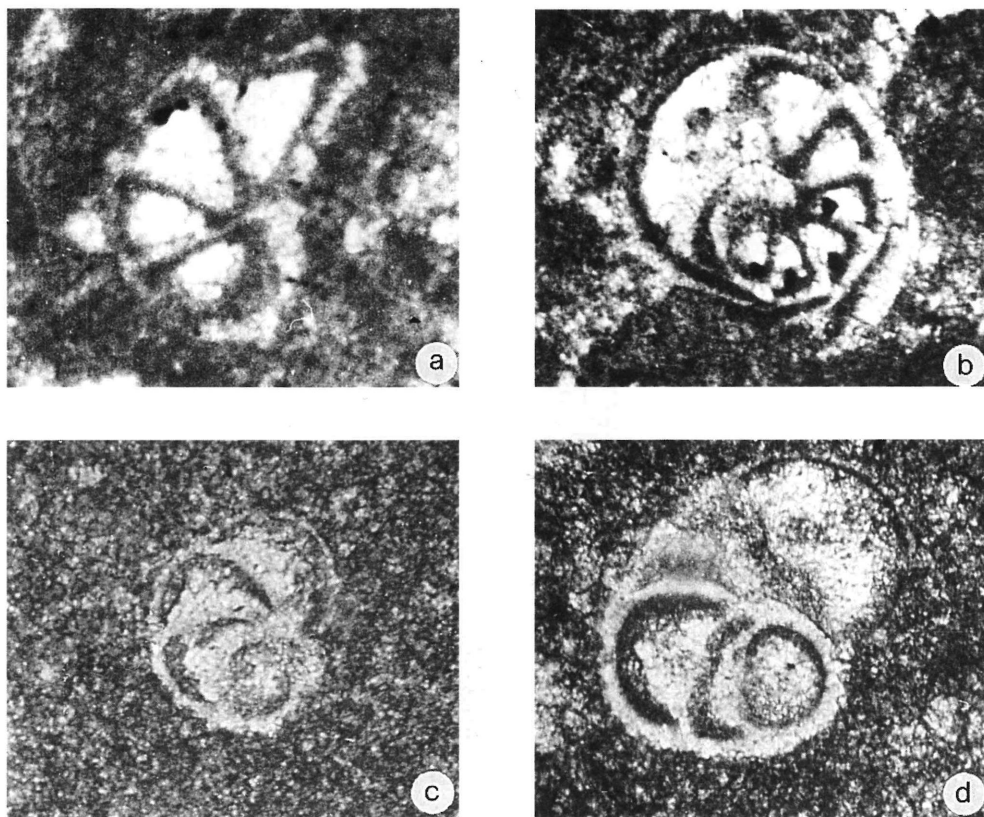


Fig. 3 - Comparison between *Archaeosepta platierensis* (a, b) and *Abriolina mediterranea* (c, d) from the "Monte Facito Formation". (X 200)

- test free, middle-small sized, plurilocular;
- low trochospiral coil;
- nonlamellar wall of two layers, inner layer microgranular and outer hyaline, optically radial; thickness of two layers, approximately equal, seems to vary in the different parts of the test;
- simple aperture at the base of the septum.

If we give a suprageneric value to these common characters, *Archaeosepta* and *Abriolina* should belong to the same family Abriolinidae Zaninetti & Rettori, 1992.

The characters which distinguish the two genera include the shape of the test, the shape of the chambers and, probably, the shape of the aperture. In fact:

- *Abriolina* has a Globigerina-like test, spiral side a little more convex than the ventral side, which shows a rather narrow umbilicus (Rettori, 1995 Pl. 7, figs 5-9).

In contrast *Archaeosepta* shows the spiral side convex and the ventral side flat or just a little concave, on the ventral side the last chamber extends to cover partly the chambers of the final whorl and the umbilical area (Wernli, 1970, Pl. I, figs 1b, 2d, 3b, 4b).

- The globular chambers of *Abriolina* are delimited by septa bent backward in respect to the coil; in the transverse sections of the dorsal side, the septa delimitate scythe-like chambers.

The chambers of *Archaeosepta* are generally less globular and the septa less bent; in the

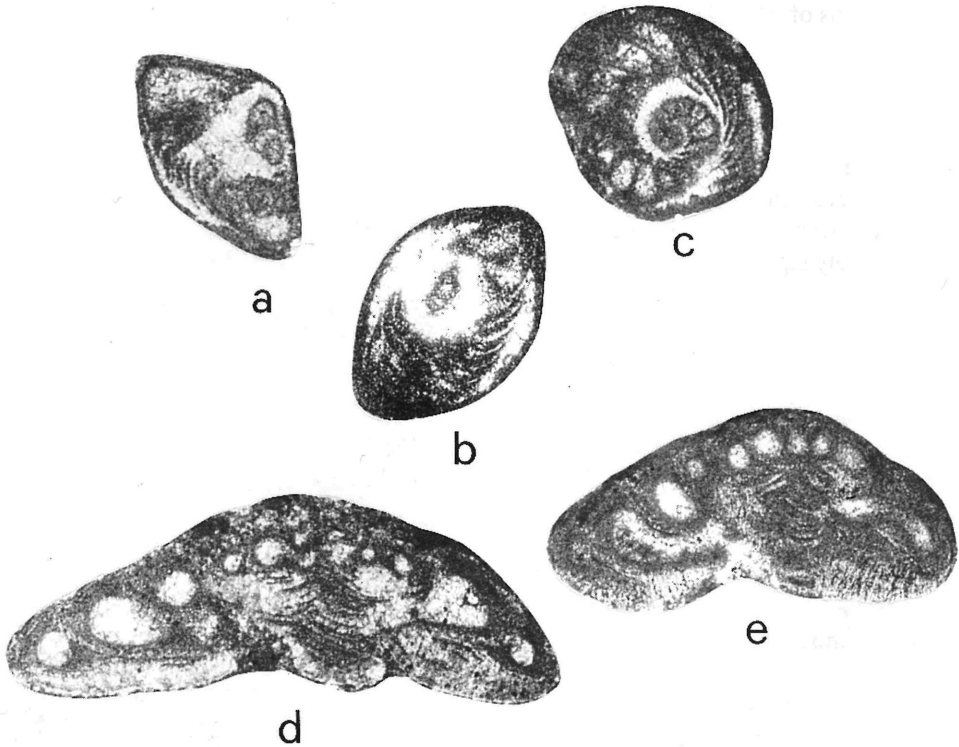


Fig. 4 - Comparison between *Protopeneroplis striata* Weynschenk (a, b, c) and *?Conicospirillina basiliensis* Mohler (d, e): the samples clearly show that both these benthic foraminifers have the double lamellar wall.

(a, b, c X 75; d, e X 50)

transverse sections of the spiral side the septa delimitate subtriangular chambers (Wernli, op. cit., Pl. II, figs 4, 7, 9).

- The aperture of *Abriolina* even if not clearly observed should be circular at the base of the septum, according to Luperto (1963, 1965).

The aperture of *Archaeosepta* is a narrow arch at the base of the apertural face, at least in the final chamber.

Family Abriolinidae Zaninetti & Rettori
in Zaninetti *et al.*, 1992
(type genus: *Abriolina* Luperto, 1963)

Description

Small Foraminifera with trochospirally coiled chambers, subglobular to rounded subangular, arched in section. The trochospiral coil can sometimes be irregular and/or become uncoiled. Globular, typically large proloculus. Wall of two layers, nonlamellar: inner layer microgranular, outer layer calcareous hyaline. Aperture simple, basal.

Remarks

This is the description by Rettori (1995), to which we have added the specification concerning the nonlamellar character of the double wall. We could observe this character in the specimens of *Abriolina mediterranea* obtained from L. Zaninetti and R. Rettori.

Genus *Archaeosepta* Wernli, 1970
(type species: *Archaeosepta platierensis* Wernli, 1970)

Description

Test free, plurilocular, trochospiral, nonlamellar. Wall of two layers: a dark microgranular inner layer and an outer clear, hyaline, optically radial layer, of approximately equal thickness. Aperture a simple interiomarginal umbilical arch.

Archaeosepta platierensis Wernli 1970
(fig. 3 a, b; Pl. 1, figs 1-12; Pl. 2, figs 1-12)

1970 *Archaeosepta platierensis* n. gen., n. sp. Wernli figs 2-3; Pl. 1, figs 3-10; Pl. 2, figs 1-6;
1972 “ “ Wernli & Jaquet Pl. I, Figs 1, 2
1978 a “ “ Septfontaine Pl. 1, figs 1-8;
1980 “ “ Septfontaine Pl. 1, figs 25-26;
1987 “ “ Barattolo & Pugliese Pl. 1, figs 7-8
1991 “ “ Septfontaine *et al.* p. 264, fig. 2

Description

Test planoconvex. Oral side flattened to weakly concave, spiral side convex. The chambers, arranged in a low trochospiral coil, have a shape of “orange quarter”. Oral side of the final chamber occupies about one half of the oral side of the test. Aperture an interiomarginal umbilical arch, more or less high.

Range and Occurrence

Archaeosepta platierensis is known from the following localities:

France: Late Bajocian-Bathonian of the southern Jura (Wernli, 1970); Late Bathonian of

Gran Crédo (Wernli & Jaquet, 1972); Bathonian of "Préalpes Briançonnais" (Septfontaine, 1978 a); Bathonian of Chablais, "Préalpes médianes" (Septfontaine, 1980).

Insular Italy: Early Bathonian of Sardinia (Dieni & Massari, 1985); Bajocian-Bathonian of the Isle of Capri (Barattolo & Pugliese, 1987).

CONCLUSIONS

The presence of *Archaeosepta platierensis* in pelagic-detrital sediments of north-eastern Latium shows that this very important stratigraphical marker was present at the northern margin (southern Jura, "Préalpes médianes", Sardinia) and at the southern margin (Isle of Capri, central Apennine) of the Neo-Tethys in the same interval (Late Bajocian-Bathonian).

Archaeosepta platierensis can be added to the Jurassic and Cretaceous benthic Foraminifera found in both neo-tethyan provinces contemporaneously (Chiocchini & Mancinelli, 1979; Chiocchini, Mancinelli & Romano, 1995; Chiocchini *et al.*, 1995).

These species of Foraminifera with a very large cosmopolitanism appear very important because they can easily be used for wide stratigraphical correlations.

The comparison between *Archaeosepta platierensis* and *Abriolina mediterranea* shows that they have same important common generic characters concerning the coil, the kind of the aperture and the structure of the wall composed of two.

Hence the attribution of the genus *Archaeosepta* Wernli, 1970 to the family Abriolinidae Zaninetti & Rettori, 1992 is here proposed.

Consequently, the family Ventrolaminidae Weynschenk, 1955, to which the genus *Archaeosepta* was previously assigned by Loeblich & Tappan (1988), is now represented only by the genus *Protopeneroplis* Weynschenk, 1955 which shows a double typically lamellar wall, with an inner microgranular layer and an outer hyaline layer (Farinacci, 1964; Septfontaine, 1974) (fig. 4).

Therefore it would be suitable to restrict the family Ventrolaminidae to Foraminifera which share a double and lamellar wall, in addition to other generic characters.

Also *?Conicospirillina basiliensis*, characterized by the same typically lamellar wall (fig. 4), could belong to the family Ventrolaminidae, maybe referred to another genus.

REFERENCES

- BARATTOLO F. & PUGLIESE A., 1987 - Il Mesozoico dell'Isola di Capri. *Quaderni Accad. Pontaniana*, **8**: 1-172.
- BOUMGARTNER P. O., 1984 - A Middle Jurassic-Early Cretaceous low-latitude radiolarian zonation based on Unitary Associations and age of Tethyan radiolarites. *Ecl. ogae geol. Helv.*, **77/3**: 729 - 837.
- BOUMGARTNER P. O., 1987 - Age and genesis of Jurassic Radiolarites. *Ecl. ogae geol. Helv.*, **80/3**: 831 - 879.
- CECCA F., CRESTA S., PALLINI G. & SANTANTONIO M., 1990 - Il Giurassico di Monte Nerone (Appennino Marchigiano, Italia Centrale): biostratigrafia, litostratigrafia ed evoluzione paleogeografica. F. E. A. Atti 2° Conv. Pergola 1986: 63-140.
- CENTAMORE E., CHIOCCHINI M., DEIANA G., MICARELLI A. & PIERUCCINI U., 1971 - Contributo alla conoscenza del Giurassico dell'Appennino umbro-marchigiano. *Studi Geologici Camerti*, **1**: 7-89.
- CHIOCCHINI M., FARINACCI A., MANCINELLI A., MOLINARI V. & POTETTI M., 1995 - Biostratigrafia a foraminiferi, dasicladali e calpionelle delle successioni carbonatiche mesozoiche dell'Appennino centrale (Italia). In: A. Mancinelli (Ed.) "Biostratigrafia dell'Italia centrale", *Studi Geologici Camerti*, special vol. 1994: 9-129.

- CHIOCCHINI M. & MANCINELLI A., 1977 - Biostratigrafia del Mesozoico in facies di piattaforma carbonatica dei Monti Aurunci (Lazio meridionale). *Studi Geologici Camerti*, **3**: 109-152.
- CHIOCCHINI M. & MANCINELLI A., 1978 - Ricerche geologiche sul Mesozoico del Gran Sasso d'Italia (Abruzzo). III. Correlazioni microbiostratigrafiche tra facies di margine della piattaforma carbonatica e facies pelagiche del Giurassico e Cretaceo inferiore. *Studi Geologici Camerti*, **4**: 19-36.
- CHIOCCHINI M. & MANCINELLI A., 1979 - *Protopenneroplis trochangulata* Septfontaine, 1974 (Foraminiferida) nel Cretaceo inferiore dell'area del Gran Sasso d'Italia (Abruzzo). *Studi Geologici Camerti*, **5**: 17-38.
- CHIOCCHINI M., MANCINELLI A. & ROMANO A., 1995 - *Chablaisia chablaisiensis* (Septfontaine, 1977) (Foraminiferida) nella sezione stratigrafica di Costa Lunga (Monte Cairo, Lazio meridionale, Italia). *Studi Geologici Camerti*, **13**: 7-27.
- CRESTA S., MONECHI S. & PARISI G., 1989 - Stratigrafia del Mesozoico e Cenozoico dell'area umbro-marchigiana. Itinerari geologici sull'Appennino umbro-marchigiano (Italia). *Memorie descrittive Carta Geol. d'It.*, **39**: 1 - 185.
- DIENI I. & MASSARI F., 1985 - Bathonian-Oxfordian of Posada. In: A. Cherchi (Ed.): "Micropaleontological researches in Sardinia", *Guidebook 19th European Micropaleontological Colloquium*. Sardinia, October 1-10, 1985: 201-206.
- FARINACCI A., 1964 - Sulla posizione sistematica e stratigrafica di *Protopenneroplis striata* Weynschenk, 1950 (Foraminifera). *Geol. Romana*, **3**, 41-48.
- FARINACCI A., 1988 - Radiolarites in a few Tethyan lacunose sequences and their relation to the late Jurassic Ophiolite event. *2nd Int. Symp. on Jurassic Stratigraphy*: 835 - 854.
- FURRER U. & SEPTFONTAINE M., 1977 - Nouvelles données biostratigraphiques (à l'aide des Foraminifères) dans le Dogger à faciès brianchonnais des Préalpes médianes romandes (Suisse). *Eclogae geol. Helv.*, **70/3**: 717-737.
- LOEBLICH A. R. & TAPPAN H., 1988 - Foraminiferal genera and their classification. *Van Nostrand Reinhold* Eds, 1-970.
- LUPERTO E., 1963 - Nuovo genere di foraminifero nel Permiano di Abriola (Potenza). *Boll. Soc. Paleont. Ital.*, **2/2**: 83-88.
- LUPERTO E., 1965 - Foraminiferi del "Calcere di Abriola". *Boll. Soc. Palaont. Ital.*, **4/2**: 161-207.
- MOHLER W., 1938 - Mikropalaontologissche Untersuchungen in der nordschweizerischen Juraformation. *Abh. schweiz. palaont. Ges.*, **60**: 1-53.
- MOSTARDINI F. & MERLINI S., 1986 - Appennino centro-meridionale. Sezioni geologiche e proposta di un modello strutturale. *AGIP, 73° Congresso Soc. Geol. It.* : 1-59.
- RETTORI R., 1995 - Foraminiferi del Trias inferiore e medio della Tetide: revisione tassonomica, stratigrafica ed interpretazione filogenetica. *Publ. Départ. Géol. et Paléont., Univ. Genève*, **18**: 1-147.
- SANTANTONIO M., 1994 - Pelagic Carbonate Platforms in the Geologic Record: Their Classification and Sedimentary and Paleotectonic Evolution. *AAPG Bull.*, **78/1**: 122 - 141.
- SEPTFONTAINE M., 1974 - Présence de *Protopenneroplis trochangulata* sp. nov. (Foraminifère) dans le Crétacé inférieur du Jura méridional et révision de *Protopenneroplis* Weynschenk, 1950. *Eclogae geol. Helv.*, **67/3**: 605-628.
- SEPTFONTAINE M., 1978 a - Présence d'*Archaeosepta platierensis* Wernli, 1970 dans le Jurassique brianchonnais des Préalpes. Importance stratigraphique; relation avec le microfaciès et la paléogéographie. *Notes Lab. Paleont. Univ. de Genève*, **1**: 1-5.
- SEPTFONTAINE M., 1978 b - Les genres *Pfenderina* Henson, 1948 et *Lituonella* Schlumberger, 1905, foraminifères) dans le Dogger brianchonnais des Préalpes. Implications biostratigraphiques dans le domaine des Couches à *Mytilus* et relations avec la province mésogénne. *Eclogae geol. Helv.*, **71/2**: 321-345.
- SEPTFONTAINE M., 1981 - Les Foraminifères imperforés des milieux de plate-forme au Mésozoïque: détermination pratique, interprétation phylogénétique et utilisation biostratigraphique. *Rev. de Micropaléont.*, **23/3-4**: 169-203.
- SEPTFONTAINE M., ARNAUD-VANNEAU A., BASSOULET J-P., GUSIC I., RAMALHO M. & VELIC I., 1991 - Les foraminifères imperforés des plates-formes carbonatées jurassiques: état des connaissances et perspectives d'avenir. *Bull. Soc. Vand. Sc. Nat.*, **80/3**: 255-277.
- WERNLI R., 1970 - *Archaeosepta platierensis* Wernli, n. gen., n. sp., un nouveau Foraminifère du Dogger du Jura méridional. *C. R. des Séances S. P. H. N. Genève*, n. s., **5/1**: 87-93.

- WERNLI R. & JAQUET J-M., 1972 - Le Bathonien et le Callovien du Col du Sac (Gran-Crédo, Ain, France). *C. R. des Séances, S. P. H. N. Genève*, n. s., 7/1: 23-30.
- WEYNSHENK R., 1950 - Die Jura-Mikrofauna und flora des Sonnwendgebirges (Tirol). *Schlern-Schriften, Innsbruck*, 83: 1-32.
- WEYNSHENK R., 1956 - Some rare index foraminifera. *Micropaleontology*, 2/3: 283-286.
- ZANINETTI L., RETTORI R., MARTINI R., CIRILLI S. & CIARAFICA G., 1992 - Il foraminifero *Abriolina* Luperto, 1963 (Trias medio, Appennino meridionale): ridefinizione, tassonomia, nuovi dati sulla distribuzione stratigrafica. *Rev. de Paléobiol.*, 11/1: 197-204.

Plate 1

Archaeosepta platierensis Wernli, 1970

(X 120)

- Figs 1, 6 - Transverse sections, slightly oblique, of the ventral side
Figs 2, 3, 5, 7 - Various oblique sections
Figs 4, 9 - Tangential sections
Fig. 8 - Transverse section, slightly oblique, of the dorsal side

Plate 2

Archaeosepta platierensis Wernli, 1970

(X 120)

- Fig. 1 - Axial section, slightly oblique
Figs 2,3,4,6,7,8 - Various oblique sections
Fig. 5 - Slightly oblique cross section of the ventral side
Fig. 9 - Slightly oblique cross section of the dorsal side

Plate 1

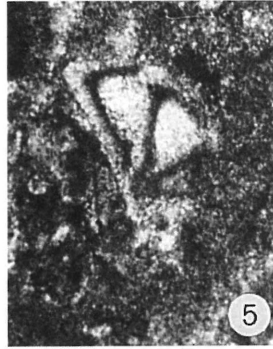
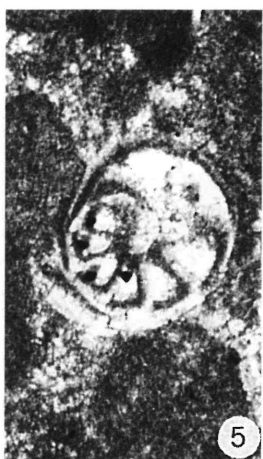
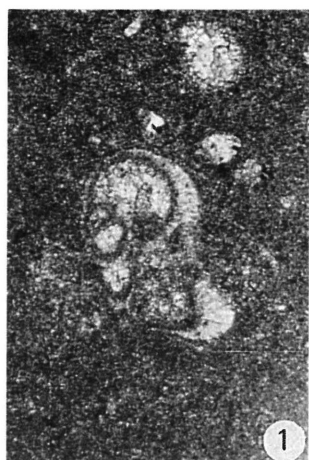


Plate 2



Licenziato alle stampe il 20 dicembre 1996
Finito di stampare Aprile 1997

Tipolitografia RIVER PRESS srl - Roma

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