Lower Aptian shallow-water benthic foraminiferal assemblage from the Chilacachapa range in the Guerrero-Morelos Platform, south Mexico

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ABSTRACT

Lower Cretaceous shallow-water benthic foraminifera were recovered from the lower part of a limestone sequence that crops out in the Chilacachapa range in the Guerrero-Morelos Platform paleogeographic unit in southern Mexico. The benthic foraminiferal association consists of Palorbitolina lenticularis, Choffatella cf. decipiens, Melathrokerion valserinensis, Glomospira urgoniana, Istriloculina eliptica, Pseudocyclammina sp., Ammovertellina sp., and Lenticulina sp. This association is documented here for the first time in the study area and Melathrokerion valserinensis for the first time in Mexico. An early Aptian age was assigned to the sequence on the basis of the size of the embryonic chamber and test characters of Palorbitolina lenticularis.

The observed lithology and foraminiferal faunas suggest a warm shallow-water platform environment. The benthic foraminiferal assemblage is considered typical of the Tethys realm, corresponding to the Barremian-Aptian boundary platform expansion, as the same benthic foraminifera are present at many localities in the Old and New World.

Key words: benthic foraminifera, shallow-water platform, Tethys realm, early Aptian, Chilacachapa range, Guerrero-Morelos platform, Mexico.

RESUMEN

Una asociación de foraminíferos bentónicos de agua somera del Cretácico Inferior fue obtenida de la parte inferior de una secuencia calcárea que aflora en la Sierra de Chilacachapa, en la unidad paleogeográfica Plataforma Guerrero Morelos (sur de México). La asociación de foraminíferos bentónicos está compuesta por Palorbitolina lenticularis, Choffatella cf. decipiens, Melathrokerion valserinensis, Glomospira urgoniana, Istriloculina eliptica, Pseudocyclammina sp., Ammovertellina sp. y Lenticulina sp. Esta asociación es documentada por primera vez en esta localidad y Melathrokerion valserinensis se documenta por primera vez en México. Se asignó una edad Aptiano inferior a esta secuencia con base en el tamaño de la cámara embrionaria y las características de Palorbitolina lenticularis.

La litología y la fauna de foraminíferos observados sugieren un ambiente de plataforma de aguas cálidas someras. La asociación de foraminíferos bentónicos, la cual está presente en muchas regiones del Viejo y Nuevo Mundo por razón de la expansión de las plataformas en el límite Barremiense-Aptiense, contiene formas típicas del Tethys.

Palabras clave: foraminíferos bentónicos, plataforma de agua somera, Tethys, Aptiano inferior, Sierra de Chilacachapa, plataforma Guerrero-Morelos, México.

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INTRODUCTION

In the south of Mexico, the Guerrero-Morelos platform is a part of the sedimentary cover of the Guerrero terrane. It is composed of a thick sequence of Albian to Maastrichtian marine strata including the Morelos, Cuautla, and Mexcala formations (Hernández-Romano *et al.*, 1997; Aguilera-Franco and Hernández Romano 2004).

Hernández-Romano *et al.* (1997) studied the facies from three sections situated in the central part of the Guerrero-Morelos platform (Guerrero State). They found that, in this area, an Aptian-Albian sequence (Huitzuco Anhydrite) underlies the shallow marine limestone of the Morelos Formation. Alluvial sandstone and conglomerate (Zicapa Formation) were deposited to the east at the same time, and the limestone Acahuizotla Formation was accumulated seaward in the carbonate platform (Figure 1a).

The oldest Cretaceous calcareous succession was deposited to the west of the Guerrero-Morelos Platform. Ontiveros-Tarango (1973) measured the thickness of this sequence as 650 m in the eastern flank of the Chilacachapa range, in the nucleus of the range fold. He gave it the name Acahuizotla Formation following Cserna (1965). According to his description, the unit consists of oolitic packstone with some miliolids intercalated with packstone with *Orbitolina* sp. and *Choffatella decipiens*, indicating an Upper Aptian age. Cserna *et al.* (1978) agreed with Ontiveros-Tarango (1973) that the reefal limestone outcropping in the Chilacachapa Anticlinorium represents the oldest rocks in the nucleus, which are overlain by the rudist-bearing Morelos Formation. Some authors use the name Chilacachapa Formation for this succession that crops out in the Chilacachapa range (Campa and Ramírez, 1979; García Díaz, *et al.*, 2009).

Most paleontological sedimentological, and paleomagnetic studies of the Guerrero-Morelos Platform have focused on the Morelos and Mexcala Formations of Cenomanian-Maastrichtian age (Alencáster 1980; Guerrero-Suástegui *et al.*,1993; Monod and Busnardo, 1993; Hernández-Romano *et al.*, 1997; Flores de Dios *et al.*, 2004; Molina Garza *et al.*, 2003; Aguilera Franco and Hernández Romano, 2004). However few paleontological reports on Lower Cretaceous fauna have been published (Morales-Soto, 1987; Vidal *et al.*, 1991; Omaña and Morales-Soto, 1998).

The objective of this paper is to report and describe the occurrence of the larger benthic foraminifera recovered from the Acahuizotla Formation, in order to support an accurate dating of the interval studied; and to interpret the environment where this community flourished, examining the paleobiogeographical significance of the association.

GEOLOGICAL SETTING AND STRATIGRAPHY

The section studied is located 2 km west of the town of Chilacachapa, Guerrero State, within the Guerrero-Morelos Platform (Figure 1b). According to Nieto Samaniego *et al.* (2006), the stratigraphic sequence of the Guerrero-Morelos Platform is comprised of the following units: 1) In the eastern part, the lower unit is the Zicapa Formation, consisting of red beds intercalated with marine limestone. Its contact with the overlying limestone is transitional. 2) In the western part, the Zicapa Formation is absent and the lower unit is the Huitzuco Anhydrite. Neither of these two formations has yielded fossils; their age is inferred to be Aptian-Albian because they underlie the Morelos Formation, which contains fossils of Albian age.

The Acahuizotla Formation, located in the western part of the platform also underlies the Morelos Formation (Ontiveros Tarango, 1973). It consists of wackestone-packstone that contains an early Aptian foraminiferal assemblage.

The most characteristic rocks of the Guerrero-Morelos Platform comprise a thick succession of Albian to Maastrichtian marine strata (Morelos, Cuautla, and Mexcala formations). (Figure 1c). This marine sequence is made up of shallow-water marine limestone that grades up to Turonian-Maastrichtian siliciclastic rocks (Hernández-Romano *et al.*, 1997; Aguilera Franco, 2003). An unconformity is present between this sequence and the overlying formation of Paleocene-Eocene volcanic rocks and continental red beds.

MATERIAL AND METHODS

The material consists of limestone samples that were collected from a 300 m thick section (Figure 2). The Acahuizotla Formation is composed of a limestone bed which ranges from 1 to 10 m thick. The lower part (120 m) contains the foraminiferal assemblage described in this paper. The upper part is a wackestone of pellets and bioclasts without microfauna, underlying the Morelos Formation.

Thin sections were prepared, and the benthic foraminiferal assemblages and microfacies were examined. Well-oriented thin sections were obtained for study of the morphology of the foraminifera. *Palorbitolina lenticularis* and *Melathrokerion valserinensis* are particularly abundant, and *Choffatella* cf. *decipiens*, *Glomospira urgoniana*, *Pseudocyclammina* sp., *Istriloculina eliptica*, *Ammovertellina* sp. and *Lenticulina* sp. were also identified (Figures 3-5).

SYSTEMATIC PALEONTOLOGY

Identification of genera was based on the classification proposed by Loeblich and Tappan (1988), and that of suprageneric categories on the classification of Loeblich and Tappan (1992). The species described were deposited in the Paleontology Collection at the Institute of Geology, Universidad Nacional Autónoma de México (UNAM).

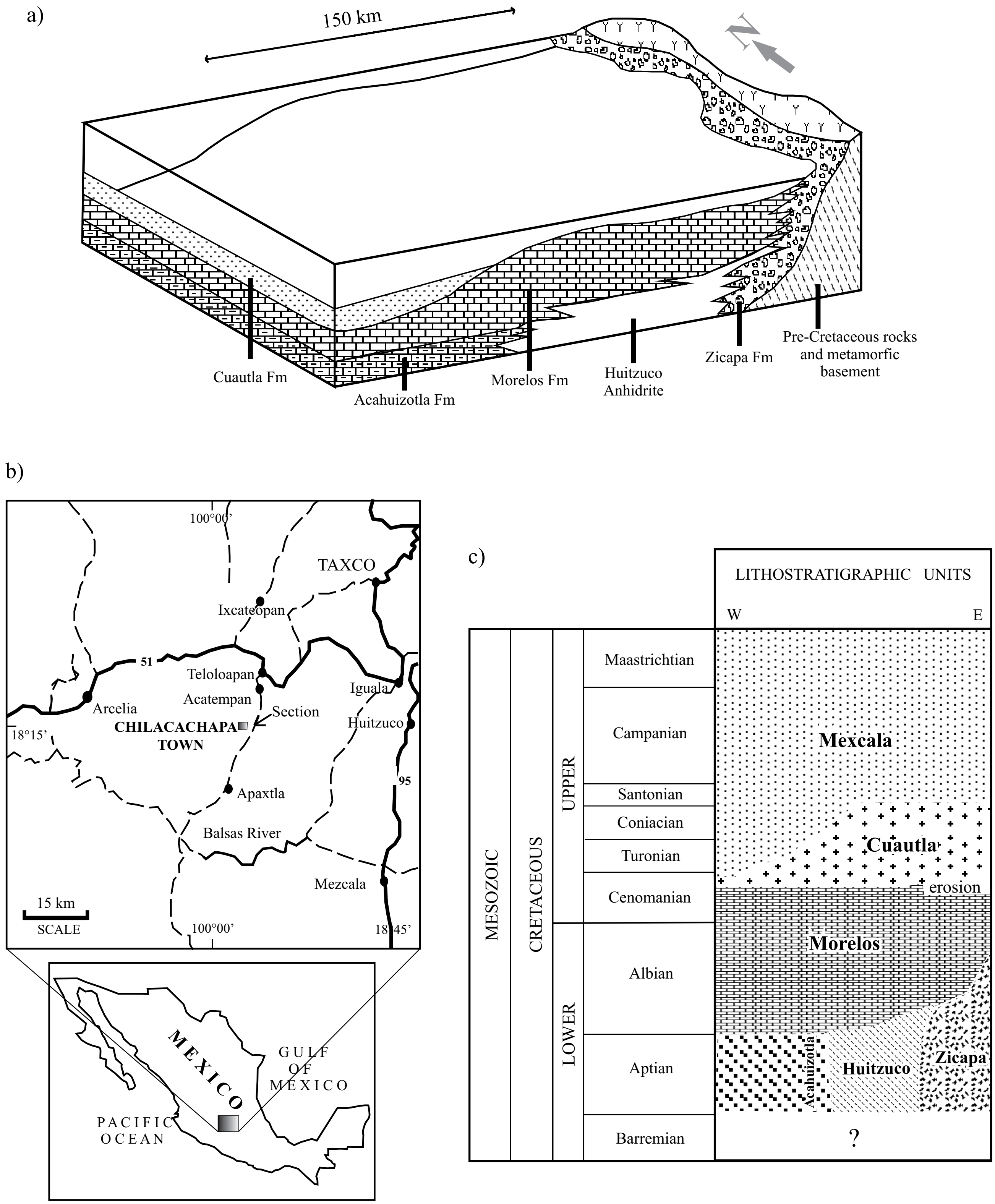


Figure 1. a: Distribution of the lithological units related to their paleogeographic position in the Guerrero-Morelos Platform (modified from Hernández-Romano *et al.*, 1997). b: Location map of the section studied. c: Stratigraphic position of the lithological units that crop out in the Guerrero Platform (modified from Aguilera and Hernández-Romano, 2004).

Order Lituolida Lankester, 1885
Superfamily Ammodiscacea Reuss, 1862
Family Ammodiscidae Reuss, 1862
Subfamily Ammovertillininae Saidova, 1981
Genus *Ammovertellina* Suleymanov, 1959

***Ammovertellina* sp.** (Figure 4d)

Description. Proloculus followed by streptospirally wound tubular second chamber as in *Glomospira*, later becoming planispiral as in *Glomospirella*, final stage uncoiling and with zigzag or irregular growth, wall agglutinated, aperture at the open end of the tube.

Genus *Glomospira* Rzehak, 1885

***Glomospira urgoniana* Arnaud Vanneau, 1980**

Glomospira urgoniana Arnaud Vanneau, 1980; Chiocchini *et al.*, 1984, p. 172, pl. 1, figs. 14, 16; Omaña and Pantoja Alor, 1988, p. 67. fig. 4; Krobicki and Olszewska, 2005, p. 222, figs. 4c, d.

Description. Test with proloculus followed by undivided second chamber somewhat irregularly streptospirally coiled, wall finely agglutinated, aperture at the open end.

Superfamily Biokovinacea Gusić, 1977
Family Charentiidae Loeblich and Tappan, 1985
Genus *Melathrokerion* Brönnimann and Conrad, 1967

***Melathrokerion valserinensis* Brönnimann and Conrad, 1967** (Figures 5a, 5b, 5d)

Melathrokerion valserinensis Brönnimann and Conrad, 1967, p. 132; Schroeder *et al.*,1982, p. 929, pl. 2, fig. 2.

Description. Test with planispiral coiling and involute,with a slight tendency to be streptospiral in the early stage, protoconch globular followed by three whorls of globular chambers, slightly arched radial sutures, periphery rounded, aperture a crescentic areal slit, wall agglutinated micro-granular striated by narrow canaliculi.

Remarks. *Melathrokerion* differs from *Charentia* in having a broad crescentic areal aperture, more rounded test and thicker septa with coarser pseudoalveolar canaliculi (Loeblich and Tappan, 1988). Several specimens were observed in axial, tangential and equatorial sections.

Known range. Barremian to early Aptian.

Geographic distribution. *Melathrokerion valserinensis* was described in the French Alps and has been reported from the northern margin of the Tethys in Spain, France and Switzerland (Arnaud-Vanneau and Sliter, 1995).

Superfamily Loftusiacea Brady, 1884
Family Cyclamminidae Marie, 1941
Subfamily Choffatellinae Maync, 1958
Genus *Choffatella* Schlumberger, 1905

***Choffatella* cf. *decipiens* Schlumberger, 1905**
(Figure 4f)

Description. Test compressed planispirally coiled, whorls enlarging, chambers numerous, wall exoskeleton with well developed subepidermal network, endoskeleton consists of thick, massive septa pierced by large apertures in the median plane of the test.

Remarks. Two specimens were observed in oblique-sub-equatorial section, however the lack of additional material makes an accurate identification impossible.

Genus *Pseudocyclammina* Yabe and Hanzawa, 1926

***Pseudocyclammina* sp.** (Figure 5c)

Description. Test planispiral, wall coarsely agglutinated, with subepidermal network.

Superfamily Orbitolinacea Martin, 1890
Superfamily Orbitolinacea Martin, 1890
Family Orbitolinidae Martin, 1890
Subfamily Orbitolininae Martin, 1890
Genus *Palorbitolina* Schroeder, 1963

***Palorbitolina lenticularis* (Blumenbach, 1805)**
(Figures 3a, 3b, 3d; 4a, 4b, 4c)

Madreporites lenticularis Blumenbach, 1805, pl. 80, figs. 1-6.
Orbitolina lenticularis (Blumenbach) Douglass, 1960, p. 31, pl. 1, figs. 1-26.
Orbitolina (Palorbitolina) lenticularis Blumenbach, Schroeder, 1963a, p. 348, pl. 23, figs. 1-9, pl. 24, figs. 1-10; Schroeder, 1964, p. 465.
Orbitolina conoidea Grass, Sen Gupta and Grant, 1971, p. 934, fig. 3.
Palorbitolina lenticularis (Blumenbach) Schroeder and Cherchi, 1979, p. 581, pl. 1, figs. 1, 2, pl. 2, fig. 3; Meza, 1980, p. 20, pl. 1, figs. 1-9, p. 23, pl. 2, fig. 12; Chiocchini *et al.*, 1984, p. 173, pl. 1, fig. 1-2; Pantoja-Alor *et al.* 1994, p. 215, pl. 1, figs.1-5; Omaña and Pantoja-Alor, 1998, p. 70, figs. 5 (1, 3); Schroeder *et al.*, 2002, p. 861, pl. 2, figs. 5, 7; Granier *et al.*, 2003, p.10, fig. 10; Albrich *et al.*, 2006, p. 445, pl. 6, figs. 10, 13.

Description. Test characterized by megalospheric embryonic apparatus in central position consisting of a large embryonic chamber covered by a layer of small chamberlets. The diameter of the embryonic chamber of the specimens studied was 250 µm.

Remarks. Abundant *Palorbitolina lenticularis* were observed. The dimension of the embryonic diameter ranges among some specimens from 200 to 250 µm and test di-

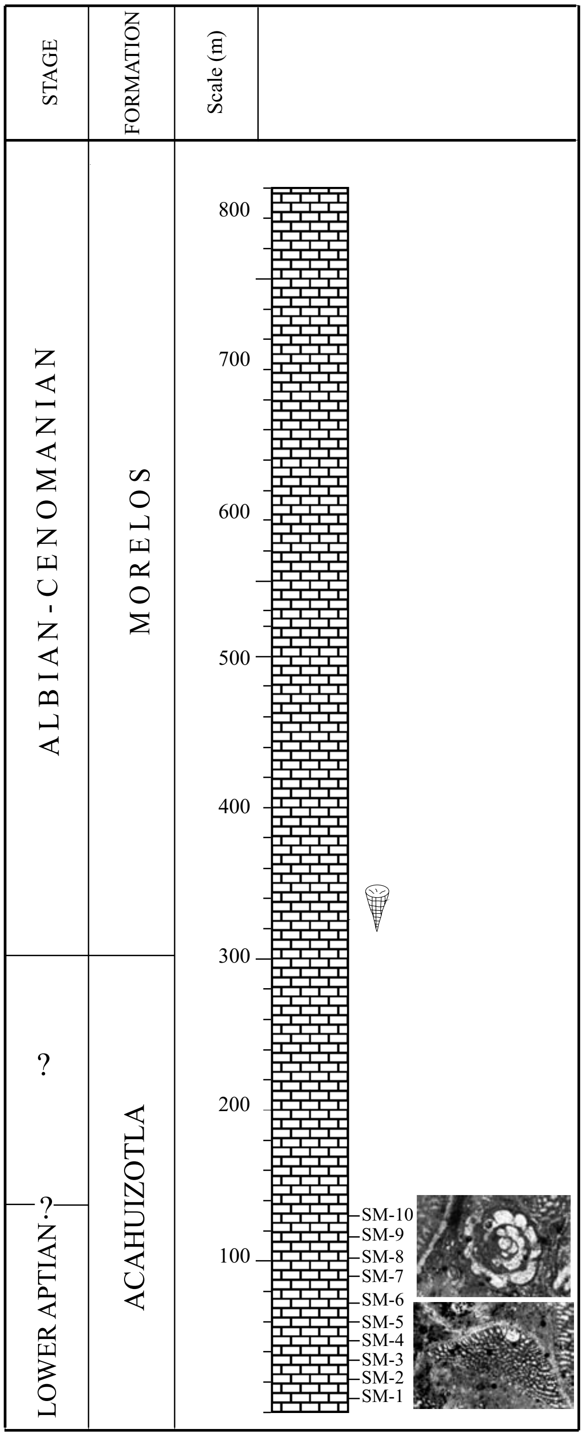


Figure 2. Stratigraphic section of the Acahuizotla Formation and location of the samples studied.

ameter is 3–3.5 mm.

In Mexico, *Palorbitolina lenticularis* has been reported by Meza (1980) from some localities including Anticlinal Characo (Guerrero), Potrero de Oballos (Coahuila), Sierra de la Cadena (Durango) and Los Humeros (Puebla). Pantoja Alor *et al.* (1994) recorded *Palorbitolina lenticularis* in the Comburindio Formation, and Omaña and Pantoja Alor (1998) reported this foraminifer from the El Cajón Formation, both located in the Huetamo region, Michoacán.

Known range. Barremian to early Aptian.

Geographic distribution. *Palorbitolina lenticularis* is widely distributed in the Tethys realm.

Order Miliolida Lankester 1885 (as Miliolidea, nom. corr. Calkins, 1909)
Suborder Miliolina Delage and Hérouard, 1896
Superfamily Miliolacea Ehrenberg, 1839
Family Hauerinidae Schwager, 1876
Subfamily Haueríninae Schwager, 1876
Genus *Istriloculina* Neagu, 1984

***Istriloculina eliptica* (Yovcheva 1962)** (Figure 4e)

Pyrgo eliptica Yovcheva, 1962, p. 52, pl. 2, figs. 7-11; Arnaud Vanneau and Sliter, 1995, p. 564, fig. 15; Krobicki and Olszewska, 2005, p. 222. figs. 4c, d.

Description. Test elongate ovate, early stage quinqueloculine, later pseudotriloculine to biloculine, sutures depressed. Wall very thin, perforate calcareous porcelanaceous.

Remarks. Species of *Istriloculina* are widespread in restricted Cretaceous environments, and are generally identified as *Pseudotriloculina* Cherif, 1970. This taxonomic placement is however incorrect because the Cretaceous forms are now assigned to *Istriloculina* (Arnaud-Vanneau and Sliter, 1995).

Known range. Hauterivian to early Aptian.

Geographic distribution. *Istriloculina eliptica* was originally described from the Aptian of Bulgaria and is recorded along the margins of the Tethys (Arnaud-Vanneau and Sliter, 1995).

AGE

The Orbitolinids are one of the most significant larger foraminifera for early to mid- Cretaceous biostratigraphic studies of carbonate platform sediments in the Tethys realm. Studies on orbitolinids with a complex embryon such as *Palorbitolina*, *Orbitolina*, *Mesorbitolina* and *Conicorbitolina* enable several phylogenic lineages to be established for the Barremian-Cenomanian interval. The succession of the species shows evolution of the size and morphological features of the test. The progressive increase in complexity of the embryon morphology in megalospheric forms has enabled numerous species to be regarded as biostratigraphical markers (Schroeder, *et al.*, 2002).

Investigation of the Hauterivian to early Aptian orbitolinids was carried out in localities where these foraminifers have been calibrated from the biostratigraphical point of view, because they are associated with ammonites (Clavel *et al.*, 1995, Charollais *et al.*, 1998). From the results of this study, four phylogenic lineages are proposed, based on spe-

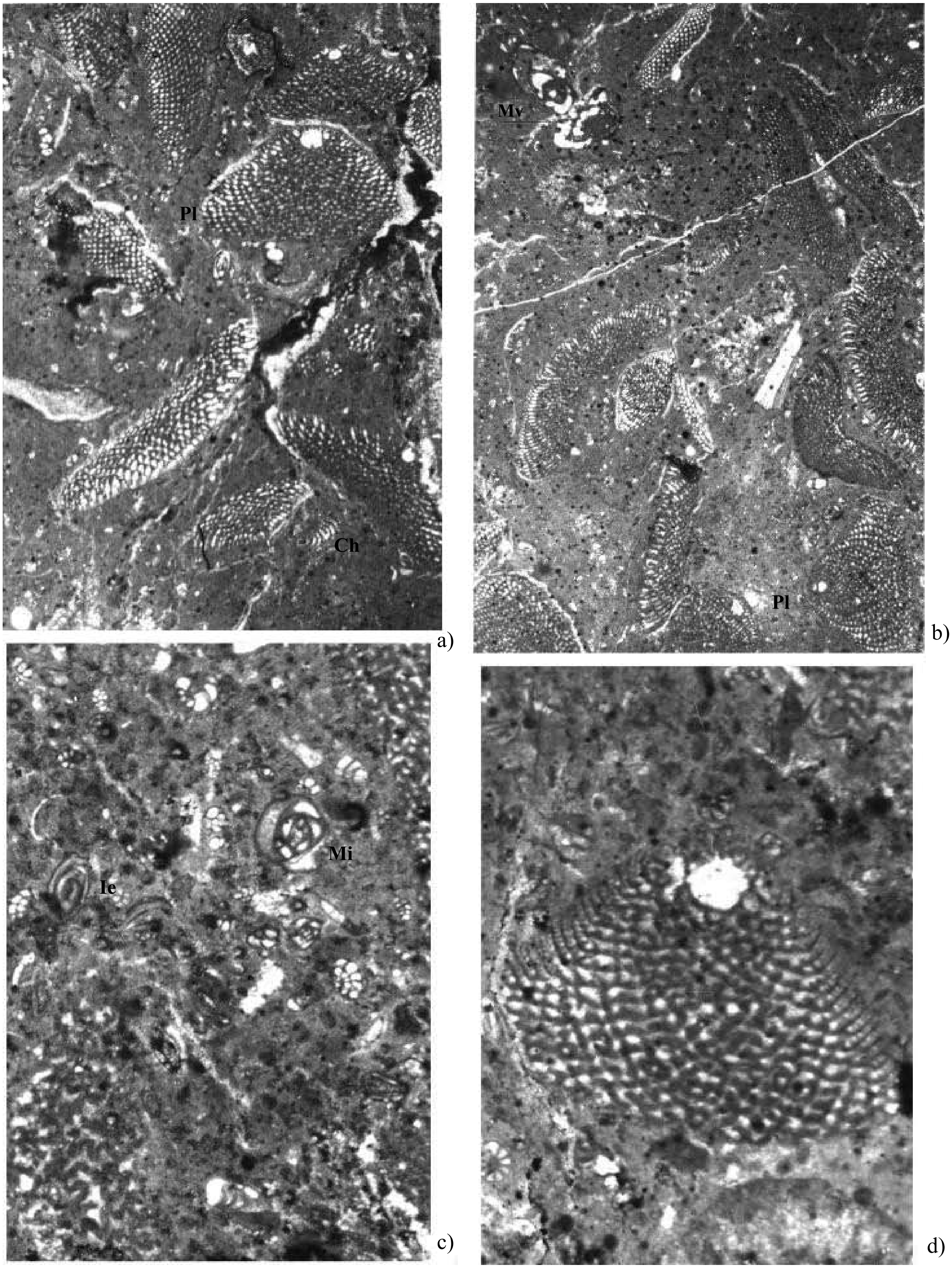


Figure 3. Early Aptian larger foraminifera from the Acahuizotla Formation. a: Wackestone-packstone with *Palorbitolina lenticularis* (Pl) and *Choffatella* cf. *decipiens* (Ch) (Sample SM-1) 14X; b: wackestone-packstone with *Palorbitolina lenticularis* (Pl) and *Melathrokerion valserinensis* (Mv) (Sample SM-1) 10X; c: wackestone-packstone with *Istriloculina eliptica* (Ie) and miliolid (Mi), (Sample SM-2) 10X; d: Oblique tangential section of *Palorbitolina lenticularis* showing the megalospheric embryon (Sample SM-4) 40X.

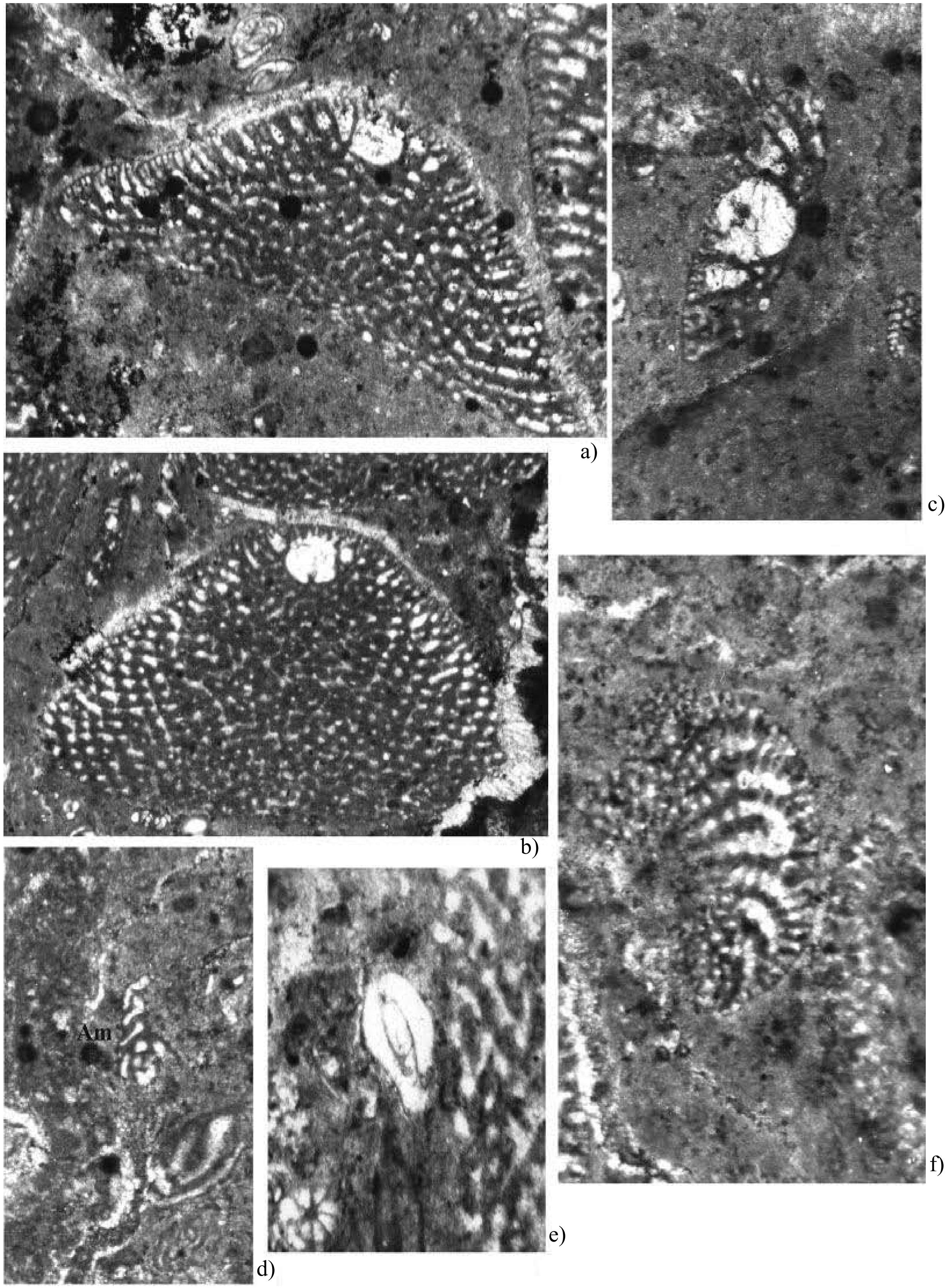
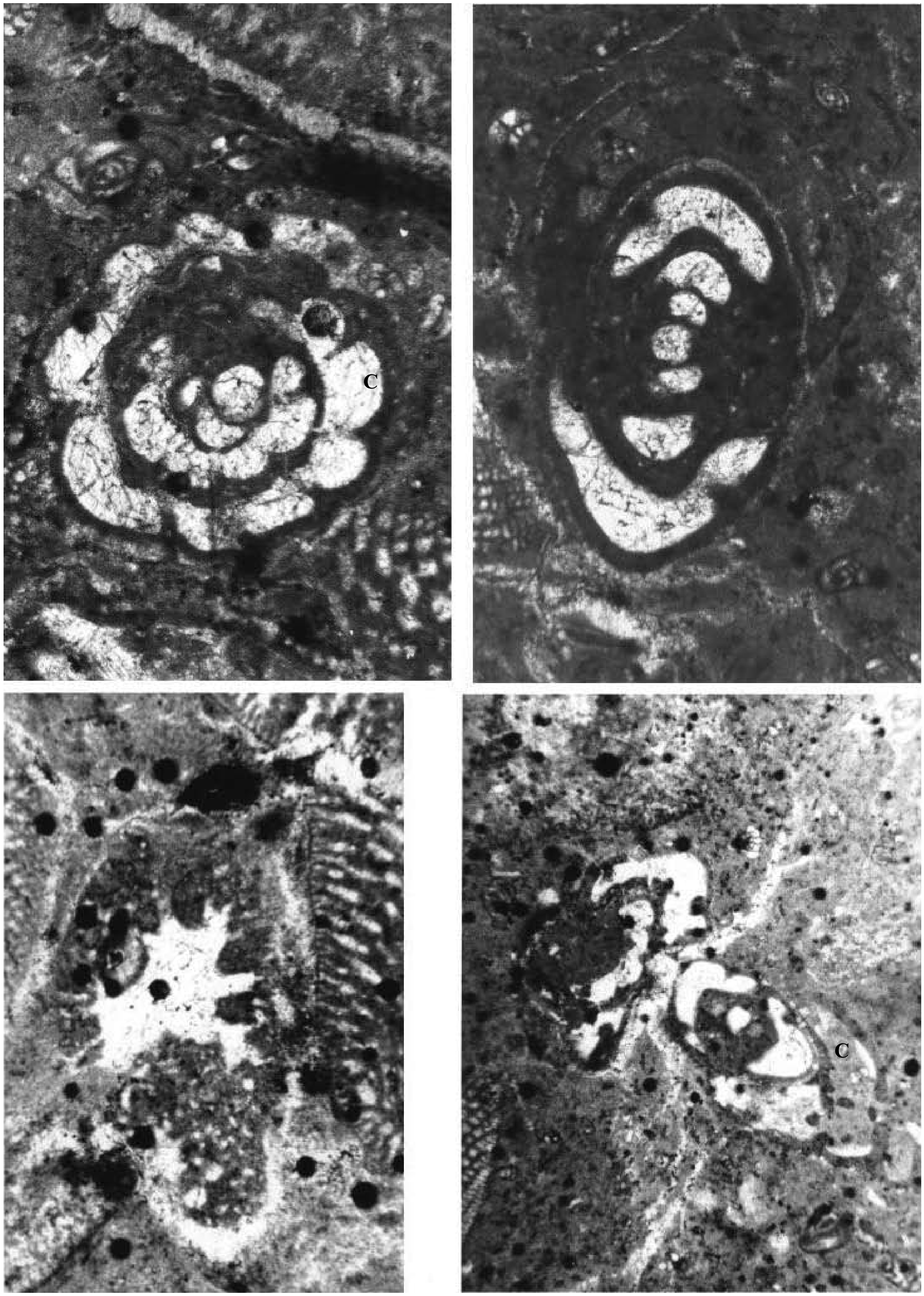


Figure 4. Early Aptian larger foraminifera from the Acahuizotla Formation. a: Axial section of *Palorbitolina lenticularis* showing the megalospheric embryon enclosed by a periembryonic ring and in the upper part the subepidermal chamberlets (Sample SM-6) 54X; b: axial section of *Palorbitolina lenticularis* (Sample SM-1) 35X; c: axial section of a young specimen of *Palorbitolina lenticularis* (Sample SM-1) 65X; d: *Ammovertellina* sp. (Am) (Sample SM-2) 70X; e: *Istriloculina eliptica* (Sample SM-4) 100X; f: Oblique subequatorial section of *Choffatella* cf. *decipiens* (Sample SM-1) 54X.



a) b) c) d)

Figure 5. Early Aptian larger foraminifera from the Acahuizotla Formation. a: Equatorial section of *Melathrokerion valserinensis* showing planispiral coiling and the structure of the wall (C) (Sample SM-1) 40X; b: axial section of *Melathrokerion valserinensis* (Sample SM-1); 40X; c: Subaxial section of *Pseudocyclammina* sp. (Sample SM-6) 40X; d: Oblique subequatorial and axial sections of *Melathrokerion valserinensis* (Sample SM-1) 30X (C narrow canaliculi).

cies considered as important markers for this interval.

According to Schroeder *et al.* (2002), the evolutionary trend of the four phylogenic lineages in the external features is: a) increase in test size; b) extension of the apical angle, making the test flatter; and c) gradual decrease of the initial spire in the megalospheric forms. The evolution of the internal features showed: a) gradual increase in size of the embryonic chambers (proto and deuteroconch), which are first eccentric and later displaced to a central position; b) formation of a central subepidermal chamberlet layer in the highest part of the embryo; and c) gradual development of chamber height and complex subdivision of the marginal zone by the vertical and horizontal plates. The older forms of the first lineages do not have a horizontal plate.

In the Barremian and early Aptian, *Eopalorbitolina charollaisi* - *E. transiens* - *Palorbitolina lenticularis* appear in chronological order. These phylogenic lineages are distinguished by two important characters: increase in size of the test and position and morphology of the embryonic apparatus. In the test of *Palorbitolina lenticularis*, the embryon is central, the upper part is subdivided by the subepidermal chamberlets forming a well-developed layer, and the first post-embryonic chamber becomes very large, enclosing the proloculus as a periembryonic ring.

In the present study, for the lower part of the calcareous sequence of the Acahuizotla Formation, which crops out near the town of Chilacachapa, an early Aptian age was assigned on the basis of abundance and the advanced evolution of the test, and the size of *Palorbitolina lenticularis* embryonic apparatus following Schroeder *et al.* (2002).

In addition, the age assignment agrees with Cherchi (2004) who stated that "shortly after its first occurrence in SW Europe (late Barremian), *Palorbitolina lenticularis* reached the American continent (Flemish Cap, NW Atlantic). This dating shows its spread from east to west by Tethyan transoceanic currents, and may be related to the meroplanktonic stage of the megalospheric embryos, and a subsequent phase as epiphytic organisms."

The biostratigraphic data change the age previously assigned to the interval studied, which had been considered to be late Aptian because of misidentification of the marker fossil as "*Orbitolina*" (Ontiveros-Tarango, 1973; Cserna *et al.*, 1978).

PALEOENVIRONMENT

The paleoenvironmental interpretation is based on the microfacies and fossil assemblage, which is composed of abundant *Palorbitolina*, *Melathrokerion*, *Choffatella*, *Pseudocyclammina,* miliolids and *Lenticulina* sp.

Palorbitolina lenticularis is considered to be a facies marker, however it has been reported in a wide range of environments from the infralittoral zone (Rey, 1975) to deep circumlittoral conditions (Masse, 1976).

Arnaud-Vanneau (1980) found that this species was recorded in different forms in both the infralittoral and circumlittoral environments. Arnaud (1981) recognized three environments for three different subspecies of *Palorbitolina lenticularis*; circumlittoral, infralittoral, and marly channels. Banner and Simmons (1994) suggested that these larger foraminifera could inhabit depths of 5–10 m., but preferred a range of 10–60 m. Vilas *et al.* (1995), based on an Iberic-Prebetic example, presented a model with the *Palorbitolina* facies throughout the whole platform consisting of five depositional environments from the littoral environment to the outer shelf area. Husinec (2001) proposed that *Palorbitolina* lived within a protected, low-energy subtidal environment that was affected and modified by storm events.

In the sequence studied, the occurrence of abundant *Palorbitolina*, *Melathrokerion Choffatella* in addition to *Lenticulina* and the mud-dwelling *Istriloculina* and *Glomospira* and the textural limestone interpretation (wackestone-packstone) suggested a quiet shallow-water platform environment.

PALEOBIOGEOGRAPHY

The foraminiferal assemblage identified from the Acahuizotla Formation includes well-known species from the Tethyan realm such as *Palorbitolina lenticularis*, a species with a world-wide distribution in lower Aptian carbonate platforms, when broad, shallow-water carbonate platforms occupied extensive areas between paleolatitudes 35°N and 35°S.

Palorbitolina lenticularis is documented from numerous localities in the northwestern Atlantic (Sen Gupta and Grant, 1971; Schroeder and Cherchi, 1979), Mexico (Meza, 1980; Pantoja-Alor *et al.*, 1994; Omaña and Pantoja-Alor, 1998) and Venezuela (Barranquin Formation).

The distribution of *Palorbitolina lenticularis* in circum-Mediterranean regions is known in Spain from several localities: the Cantabrian basin (Schroeder, 1963b; Wilmsen 2005; Najarro *et al.*, 2007), the Iberic and Prebetic regions (Vilas *et al.*, 1995), and the Coastal Catalan Mountains (Canérot *et al.*, 1982; Albrich *et al.,* 2006). It has also been documented from Portugal (Rey, 1972), in France from the Corbières (Jaffrezo and Schroeder, 1972) and the Pyrénées (Peybernès, 1979); in Italy from the Aurunci and Ausoni in southern Lazio (Chiocchini *et al.*, 1984) and from the Murge Region on the Apula Platform (Cherchi *et al.*, 1978; Luperto Sinni and Masse, 1982).

It has been documented in Switzerland (Conrad, 1969), in Bulgaria from the Prebalkan region (Peybernès *et al.*, 1978), in Poland from the western Carpathians by Masse and Uchman (1997), in Croatia from the islands of Cres and Lošinj (Husinec *et al.*, 2000; Husinec, 2001), and Mljet Island (Husinec and Sokac, 2006).

In Africa it has been recorded from Ethiopia (Bosellini *et al.*, 1999), Somalia (Cherchi and Schroeder, 1999) and Algeria (Leikine and Vila, 1975). In the Middle East, *Palorbitolina lenticularis* has been recorded from Israel, Lebanon, and Syria (Saint-Marc, 1970; Bachmann and Hirsch, 2006), from Yemen (Cherchi *et al.*, 1998), from Saudi Arabia (Hughes, 2001), from the Upper Thamama Group in the United Arab Emirates (Granier *et al.*, 2003), from Oman (Simmons and Hart, 1987; Masse *et al.*, 1998), and also from Iran (Shakib, 1990) and Afghanistan (Montenat *et al.*, 1982).

CONCLUSIONS

Foraminiferal analysis of limestone samples from the lower part of the Acahuizotla Formation indicated that the age of these rocks is lower Aptian. This is based on the characters of the test and the morphology of the embryon of *Palorbitolina lenticularis*.

The foraminiferal assemblage is composed of the following species: *Palorbitolina lenticularis*, *Melathrokerion valserinensis*, *Choffatella* cf. *decipiens*, *Glomospira urgoniana*, *Istriloculina eliptica*, *Ammovertellina* sp. and *Lenticulina* sp., which are reported for the first time in the lower part of the Acahuizotla Formation in the Guerrero-Morelos Platform, while *Melathrokerion valserinensis* is recorded for the first time in Mexico.

A quiet, shallow-water platform environment is inferred on the basis of the limestone (wackestone-packstone) and the benthic foraminiferal assemblage.

The benthic foraminiferal association is typical of the Tethys realm, and was widely distributed in the carbonate platforms of the late Barremian-early Aptian; its occurrence is documented from numerous localities in the Old and New World.

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