Ciências da Terra (UNL)	Lisboa	Nº 16	pp. 37-43, 4 fig., 2 pl.	2007

Preliminary data on the ostracod fauna from the Lower Toarcian of Peniche

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Resumo

Palavras-chave: Ostracodos, Toarciano Inferior, Peniche, Bacia Lusitânica, Portugal

Apresentam-se os resultados preliminares do estudo sistemático e biostratigráfico dos ostracodos do Toarciano Inferior (Zonas de Polymorphum e de Levisoni) de Peniche. A maior parte das espécies identificadas é conhecida noutros países europeus. A biodiversidade e abundância das espécies é elevada na primeira biozona, diminuindo drasticamente na segunda.

Résumé

Mots-clés: Ostracodes, Toarcien Inférieur, Peniche, Bassin Lusitanien, Portugal

Nous présentons les résultats préliminaires de l'étude systématique et biostratigraphique des ostracodes du Toarcien Inférieur (Zones à Polymorphum et à Levisoni) de Peniche. La plupart des espèces identifiées est connue dans d'autres pays d' Europe. La biodiversité et l'abondance des espèces sont élevées dans la première zone et bien plus basses dans la deuxième.

Abstract

Key-words: Ostracods, Lower Toarcian, Peniche, Lusitanian Basin, Portugal

Preliminary results of the systematic and biostratigraphical study of the ostracods from the Lower Toarcian (Polymorphum and Levisoni Zones) of Peniche are presented. Most of the identified species are recognized in other European countries. Biodiversity and species abundance are high in the first Zone, decreasing dramatically in the second one.

The studied section is located at the Peniche Península, being exposed between Ponta do Trovão and Cerro do Cão. The succession corresponds to the lower part of the Cabo Carvoeiro Formation (MSTP1 to MSTP3 *in* DUARTE, 1995; Cabo Carvoeiro 1 to lowermost Cabo Carvoeiro 4 members *in* DUARTE & SOARES, 2002), which is time-constrained between the base of the Lower Toarcian and the Bifrons Zone (MOUTERDE, 1955; ELMI & *al*., 1996). For this study, marly levels have been sampled, following the bed numbering of L. DUARTE (1995).

Forty-three samples have been collected, from which 24 (P-4 to P-136) are already partially studied as regards to the ostracods. For the remainder of the samples (P-138 to P-422), their residues have been picked-up for microfossils, but the systematic identification of the ostracods has only just began. For the time being, the presence of ostracods in all the

samples can be confirmed, except for P-420, which seems to be azoic. Biodiversity is generally high, but the preservation condition of the ostracod fauna is very poor, with clearly recrystallized and strongly used specimens, making species identification very difficult.

In this work, only the data concerning the first two units of the Cabo Carvoeiro Formation are presented.

The first unit (Cabo Carvoeiro 1 member) corresponds to the Polymorphum Zone (samples P-4 to P-28). Ostracod biodiversity (fig. 1) is high (3 to 22 species/sample) and ostracod abundance (fig. 2) is varied (11 to 759 individuals/ /sample), with the highest abundance of individuals and species at the base of the biozone. Up to now, it was possible to identify (in alphabetical order): *Bairdia* aff. *molesta* APOSTOLESCU, 1959, *B.* aff. *rostrata* ISSLER, 1908, *B.* sp. 1, *B.* sp. 2, *Cardobairdia*? sp., *Ektyphocythere* cf. *knitteri* (RIEGRAF, 1984), *Isobythocypris* aff. o*valis* BATE & COLEMAN, 1975, *I. tatei* (CORYELL, 1963) *in* BATE & *al*., 1979, *I.* cf. *tatei* (CORYELL, 1963) *in* BATE & *al*., 1979, *Kinkelinella* sp. 1, *Ledahia* cf. *septenaria* GRÜNDEL, 1964, *Liasina lanceolata* (APOSTOLESCU, 1959), *L.* cf. *vestibulifera* (GRAMANN, 1963), *Ogmoconcha* cf. *contractula* TRIEBEL, 1941, *O.* cf. *dentata* (ISSLER, 1908), *O.* cf. *intercedens* DREYER, 1967, *Ogmoconchella* spp., *Paracypris* cf. *redcarensis* (BLAKE, 1876), *Polycope* cf. *cincinnata* APOSTOLESCU, 1959, *Polycope* cf. gr. *cerasia* BLAKE, 1876, *Ptychobairdia* cf. *hahni* (LORD & MOORLEY, 1974) and *Ptychobairdia* cf. *aselfingenensis* (LORD & MOORLEY, 1974). In association with the ostracods, hyaline-walled foraminifera, equinoid spines, microgastropods, bivalve fragments and fish teeth are found.

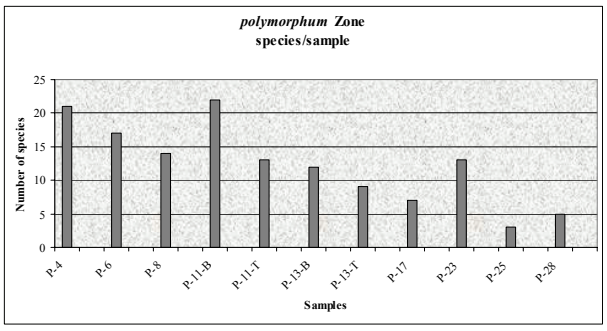

Fig. 1 – Distribution of the number of ostracod species per sample in the Polymorphum Zone, at Peniche section.

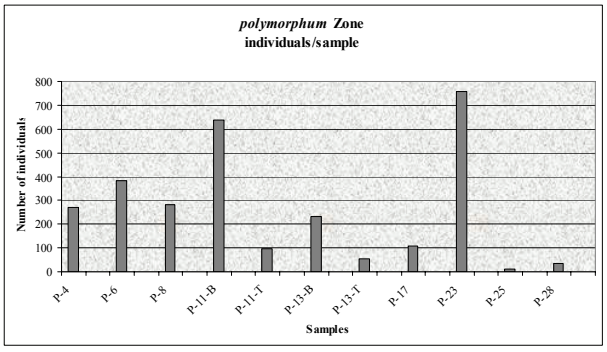

Fig. 2 – Distribution of the total number of ostracod individuals (1 individual = 1 valve or carapace) per sample in the Polymorphum Zone, at Peniche section.

The second unit (Cabo Carvoeiro 2 member) corresponds to Levisoni Zone (samples P-32 to P-136). Both ostracod biodiversity (fig. 3) and abundance (fig. 4) are low (1 to 6 species/sample and 1 to 150 individuals/sample), in particular if one compares them with the faunas from the previously mentioned biozone. In addition, these characteristics are more or less uniform throughout this second biozone. Up to now, it was possible to identify (in alphabetical order): *Bairdia* aff. *molesta* APOSTOLESCU, 1959, *Bairdiacypris* cf. *rectangularis* AINSWORTH, 1986, *Cytherella* cf. *toarcensis* BIZON, 1960, *Cytheroptheron* aff. *alafastigatum* FISCHER, 1962, *Ektyphocythere* aff. *debilis* (BATE & COLEMAN, 1975), *E.* aff. *intrepida* (BATE & COLEMAN, 1975), *Liasina lanceolata* (APOSTOLESCU, 1959), *Paracypris* aff. *redcarensis* (BLAKE, 1876), *Ptychobairdia hahni* (LORD & MOORLEY, 1974) and *Ptychobairdia* cf. *aselfingenensis* (LORD & MOORLEY, 1974). In association with the ostracod fauna, pyritized microgastropods, hyaline-walled foraminifera, equinoid spines, microgastropods, bivalve fragments and fish teeth are found.

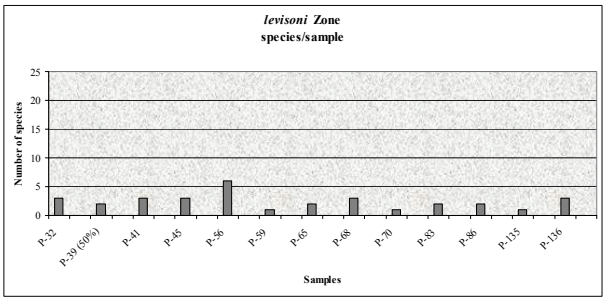

Fig. 3 – Distribution of the number of ostracod species per sample in the Levisoni Zone, at Peniche section.

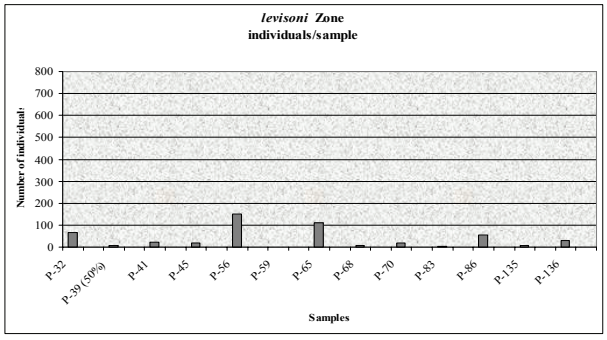

Fig. 4 – Distribution of the total number of ostracod individuals (1 individual = 1 valve or carapace) per sample in the Levisoni Zone, at Peniche section.

The already identified species agree with those referred in the literature for the two studied biozones, in nearby regions, namely in Spain (e. g. ARIAS, 1991; ARIAS & LORD, 1999), France (e. g. BIZON, 1960; DONZE, 1985, ANDREU & *al*., 1995) and United Kingdom (e. g. LORD, 1974; BATE & COLEMAN, 1975; BOOMER, 1992).

Acknowledgments

The authors wish to thank A. C. Azerêdo (Univ. Lisboa, Portugal) for helpful suggestions and the English revision.

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Plate 1

Fig. 1 – *Bairdia* aff. *molesta* APOSTOLESCU, 1959 (*in* LORD, 1971), sample P-11-T, Polymorphum Zone, carapace, right view.

Fig. 2 – *Bairdia* aff. *rostrata* ISSLER, 1908, sample P-4, Polymorphum Zone, carapace, right view.

Fig. 3-4 – *Bairdia* sp. 1, sample P-4, Polymorphum Zone.

3 – carapace, right view
4 – left valve, external view.

Fig. 5-6 – *Isobythocypris* aff. *ovalis* BATE & COLEMAN, 1975, sample P-25, Polymorphum Zone.

5 – carapace, right view
6 – carapace, dorsal view.

Fig. 7-8 – *Isobythocypris* cf. *tatei* (CORYELL, 1963) *in* R. BATE & *al.*, 1979, Polymorphum Zone.

7 – sample P-11-B, carapace, dorsal view
8 – sample P-6, carapace, right view.

Fig. 9-11 – *Ektyphocythere* cf. *knitteri* (RIEGRAF, 1984), sample P-13-B, Polymorphum Zone.

9 – carapace, right view
10 – left valve, external view
11 – carapace, dorsal view.

Fig. 12-13 – *Kinkelinella* sp. 1, Polymorphum Zone.

12 – sample P-8, carapace, right view
13 – sample P-11-B, carapace, dorsal view.

Fig. 14-15 – *Ledahia* cf. *septenaria* GRÜNDEL, 1964, sample P-6, Polymorphum Zone.

14 – carapace, dorsal view
15 – carapace, left view.

Fig. 16-17 – *Liasina lanceolata* (APOSTOLESCU, 1959), sample P-6, Polymorphum Zone.

16 – carapace, right view
17 – carapace, dorsal view.

Fig. 18-19 – *Liasina* cf. *vestibulifera* (GRAMANN, 1963), Polymorphum Zone.

18 – sample P-6, carapace, dorsal view
19 – sample P-4, carapace, right view.

Fig. 20-21 – *Ogmoconcha* cf. *dentata* (ISSLER, 1908), sample P-4, Polymorphum Zone.

20 – right valve, external view
21 – carapace, dorsal view.

Scale bar = 100 μm

Plate 1

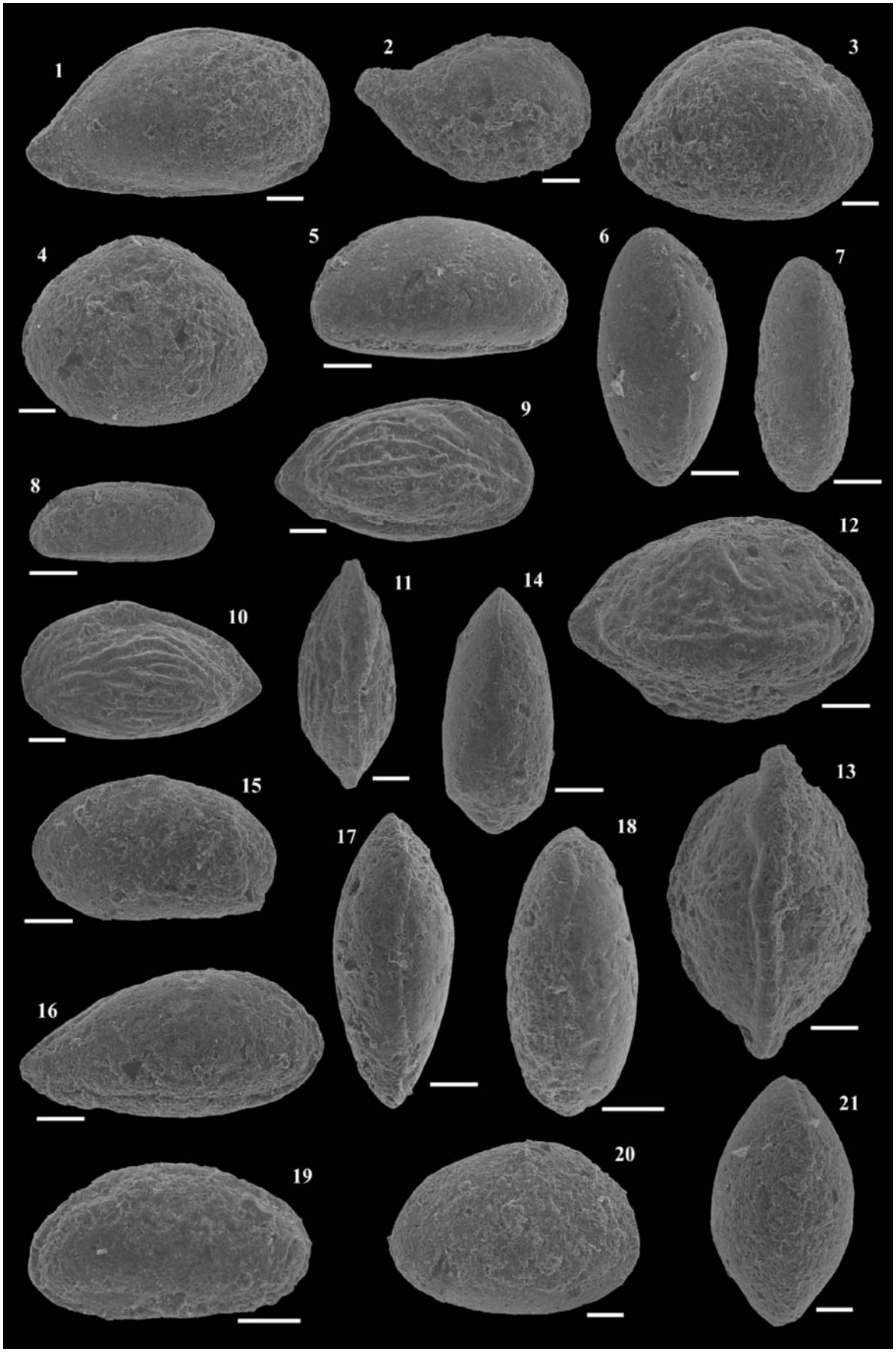

Plate 2

Fig. 1-3 – O*gmoconcha* cf. *intercedens* DREYER, 1967 (*in* MALZ, 1971), sample P-4, Polymorphum Zone.

1 – carapace, right view
2 – right valve, external view
3 – carapace, dorsal view.

Fig. 4-5 – *Paracypris* cf. *redcarensis* (BLAKE, 1876) *in*: R. BATE & *al.*, 1979, sample P-11-B, Polymorphum Zone.

4 – carapace, dorsal view
5 – carapace, right view.

Fig. 6 – *Polycope* cf. *cincinnata* APOSTOLESCU, 1959, sample P-13-T, Polymorphum Zone, carapace, right view.

Fig. 7 – *Polycope* cf. gr. *cerasia* BLAKE, 1876 (*in* ANDREU & *al*., 1998), sample P-6, Polymorphum Zone, carapace, right view.

Fig. 8 – *Ptychobairdia* cf. *hahni* (LORD & MOORLEY, 1974), sample P-6, Polymorphum Zone, carapace, right view.

Fig. 9-11 – *Cytherella* cf. *toarcensis* BIZON, 1960, sample P-32, Levisoni Zone.

9 – carapace, dorsal view
10 – carapace, left view
11 – carapace, right view .

Fig. 12-13 – *Cytheroptheron* aff. *alafastigatum* FISCHER, 1962, sample P-56, Levisoni Zone.

12 – carapace, dorsal view
13 – carapace, left view.

Fig. 14-15 – *Ektyphocythere* aff. *debilis* (BATE & COLEMAN, 1975), Levisoni Zone.

14 – sample P-65, left valve, external view
15 – sample P-68, carapace, dorsal view.

Fig. 16-17 – *Ektyphocythere* aff. *intrepida* (BATE & COLEMAN, 1975), sample P-86, Levisoni Zone.

16 – right valve, external view
17 – left valve, external view.

Fig. 18-19 – *Paracypris* aff. *redcarensis* (BLAKE, 1876), sample P-70, Levisoni Zone.

18 – carapace, dorsal view
19 – carapace, left view.

Fig. 20 – *Ptychobairdia hahni* (LORD & MOORLEY, 1974), sample P-41, Levisoni Zone, carapace, left view.

Scale bar = 100 µm

Plate 2