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Limnic ostracoda from Silveirinha, Portugal (? Late Paleocene - Lowermost Eocene)

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Abstract

Key-words: Ostracoda; ?upper Paleocene/ lowermost Eocene; Silveirinha; Portugal.

Silveirinha, a rich site for mammals and other vertebrates, yielded some molluscs, charophytes and ostracods. The latter are described here. Eight species were recognized. Two of them, *Ilyocypris lusitanicus* n. sp. and *Cypris silveirinhaensis* n. sp. are new. Other, unnamed species may be ascribed to *Cyclocypris*? and *Cypria*?, besides a further four undeterminate Cypridacea. The Ostracod association is typical for limnic environments and is compatible with intertropical conditions. *Cypris silveirinhaensis* suggests an Eocene, and especially a lower Eocene age.

Resumo

Palavras-chave: Ostracodos; ?Paleocénico superior/ Eocénico basal; Silveirinha; Portugal.

A jazida de Silveirinha, rica de mamíferos e outros vertebrados, deu também moluscos, carófitos e ostracodos, descritos neste trabalho. Foram reconhecidas oito espécies, duas novas: *Iliocypris lusitanicus* n. sp. e *Cypris silveirinhaensis* n. sp. Além destas, ocorrem espécies atribuíveis, possivelmente, aos géneros *Cyclocypris* (uma) e *Cypria* (uma), além de quatro de género(s) indeterminado(s) da superfamília Cypridacea. A associação, tipicamente indicativa de meios límnicos, é compatível com ambientes inter-tropicais. Do ponto de vista cronológico, *Cypris silveirinhaensis* sugere idade do Eocénico, em particular do Eocénico inferior.

1. Introduction

Vertebrate remains have been collected by R. Pena dos Reis (University of Coimbra) in a clay pit at Silveirinha, lower Mondego area, West-central Portugal. The concerned lithostratigraphic unit is the "Areias e argilas de Taveiro", whose lower levels are late Cretaceous in age, mainly comprises greenish, clayey beds crossed by fluviatile channels (Reis & Soares, 1981). Pelitic sediments are nearly sterile under a palaeontologic viewpoint. On the other hand, the channels'infillings are fossil-rich microconglomerates.

Sedimentation occurred in an alluvial plain, maybe in bogs that often (seasonally?) were flooded through crevasse-splay channels.

The first fossils were sent to M. T. Antunes, who identified some mammals that pointed out to lowermost Eocene (Antunes, 1981). That age was then recognized for the first time in Portugal (ibid.). A fuller account was published soon after (Antunes & Russell, 1981).

A Research Program has been developped since under the direction of M. T. Antunes. Field work and subsequent washing and sieving at the Earth Sciences Department of the Faculdade de Ciências e Tecnologia (Universidade

Nova de Lisboa) of more than 10 thousand kg of sediments allowed us to gather an impressive collection. Silveirinha became one of Western Europe's richest sites for those times. It yielded a rich mammalian fauna (for a synthesis, see Antunes *et al.*, 1997) that was recognized as older than Doormal's (in Belgium, the type site for the MP7 mammal-unit). Later on, a few similar mammalian faunulas from the Pyrenean region were shown to lay stratigraphically under marine Paleocene beds (Gheerbrant *et al.*, 1997). An upper Paleocene age cannot therefore be excluded as far as Silveirinha is concerned.

Other groups are represented: birds, including a wader (Harrison, 1983), a small-sized crocodilian, genus *Diplocynodon* (Antunes, under printing), snakes and lizards as well as amphibians (Rage, this volume), Pelomedusid chelonians (De Lapparent de Broin, idem), percomorph fishes (Gaudant & Antunes, idem), scarce (except *Bythinia*) gastropods and exceedingly rare lamellibranchs (Callapez, idem), ostracods, worms or other trace-fossil producers, scarce seeds, charophyte gyrogonites (identified by J. Riveline, Antunes & Colin, this volume), besides coprolithes and a few amber fragments.

Most fossils underwent diagenetic silicification and water transportation. They are often abraded.

2. The Ostracoda

The limnic ostracode assemblage found in Silverinha is well diversified, with 8 species recognized.

Illustrated material is provisionally deposited in the collections of the Centro de Estudos Geológicos, Faculdade de Ciências e Tecnologia (UNL).

Subclass	O S T R A C O D A Latreille, 1806
Order	PODOCOPIDA Müller, 1894
Suborder	PODOCOPA Sars, 1866
Superfamily	Cypridacea Baird, 1845
Family	Ilyocyprididae Kaufmann, 1900
Genus	*Ilyocypris* Brady & Norman, 1889

Ilyocypris lusitanicus n. sp.
(Pl. 1, figs. 1-2, 4, 8)

Derivation of name: from Portugal.
Holotype : 1 carapace (Pl. 1, fig. 2).
Paratypes: 3 carapaces.
Material : 5 carapaces.

Diagnosis: species of *Ilyocypris*, strongly reticulate, with 3 dorsal, a sub-median and a postero-ventral nodes.

Dimensions: L = 0.73 mm – 0.75 mm; h = 0.40 mm; e = 0.34 mm.

Remarks: Related species are *Ilyocypris essertinesensis* Carbonnel *et al.* 1985 from the Chattian (Oligocene) of Switzerland, which differs by the absence of a postero-ventral tubercle and is slightly larger; and *Ilyocypris cornae* Mandelstam, 1961 common in the Eocene of China (Hou *et al.*, 1978), which also lacks the postero-ventral node.

Family	Candonidae Kaufmann, 1900
Subfamily	Cyclocypridinae Kaufmann, 1900
Genus	*Cyclocypris* Brady & Norman, 1889

Cyclocypris ? sp.
(Pl. 2, fig. 8)

Dimensions: L = 0.51 mm; h = 0.46 mm.

Remarks: This species, tentatively assigned to the genus *Cyclocypris*, is morphologically close to *Porpocypris sphaeroidalis* Guan 1978 and *Cyprois globra* Chen, 1982 (*in* Hou *et al.*) from the uppermost Cretaceous of China (Zhang, 1992).

Genus *Cypria* Zenker, 1854

Cypria ? sp.
(Pl. 2, figs. 7, 9, 10)

Dimensions: L = 0.43 mm; h = 0.29 mm.

Remarks: Rather small species, strongly compressed. A related species, *Cypris dorsalta* Malz & Moyadepour, 1973 from the Miocene and Oligocene (Carbonnel *et al.*, 1985) of respectively Germany and Switzerland, is higher.

Family	Cyprididae Baird, 1845
Subfamily	Cypridinae Baird, 1845
Genus	*Cypris* Müller, 1898

Cypris silveirinhaensis n. sp.
(Pl. 1, figs.3, 5-7)

Derivation of name: from the type locality Silveirinha.
Holotype: Carapace (Pl. 1, fig. 5).
Paratypes: 3 carapaces.
Material: 12 spécimens.
Type locality and horizon: Silveirinha, Portugal, Lower Eocene.

Diagnosis: Species of the genus *Cypris* with the following characters: moderate size carapace, finely reticulated, weak anterior lip.

Dimensions: L = 1.22 – 1.39 mm; h = 0.76-0.90 mm; e = 0.89 mm.

Remarks: *Cypris silveirinhaensis* is closely related to the following species:

- *Cypris* sp. Tambareau *et al.* 1991, from the Ilerdian of the Montagne-Noire (Southern France), is smooth or very finely punctated, higher, with the greatest height in a median position.

- *Cypris pseudodecaryi* Guernet 1981 from the Sparnacian of the Paris Basin has a more compressed anterior margin, its dorsal margin is more inclined and the ornamention much finer.
- *Cypris decaryi* Gauthier, 1933, a recent intertropical species, is larger, higher and finely punctate (Neale, 1976b).
- *Cypris henanensis* Guan & Sun 1978 (= *Cypris* cf. *decaryi* auct.) from the Eocene of China (Guan, 1984; Guan & Sun, 1978; Zheng, 1983; Hou *et al.* 1978, 1982; Hao, 1988; Hao *et al.*, 1988; He & Zhang, 1982; He *et al.*, 1988), has a higher and more symmetrical carapace and a very finely punctate carapace.
- *Cypris favosa* Ye (*in* Hou *et al.*, 1978) from the Eocene of China has a similar micro-reticulate ornamentation but the carapace is narrower and more elongated.
- *Cypris subglobosa* Sowerby, 1840 *sensu* Neale, 1976a, a recent species from India, Sri Lanka and Eastern Europe, is more elongated and the recticulation meshes are larger.

Indet. Cypridacea

Indet. Cypridacea sp. 1
(Pl. 2, fig. 5)

Dimensions: L = 1.45 ; h = 0.93 mm.

Remarks: outline comparable to *Hebeina ovata* Boje, 1978 from the Oligocene of China.

Indet. Cypridacea sp. 2
(Pl. 2, fig. 6)

Dimensions: L = 1.23 mm; h = 0.92 mm.

Indet. Cypridacea sp. 3
(Pl. 1, figs. 8, 10; Pl. 2, figs. 1, 2)

Dimensions: L = 0.78- 0.81 mm; h = 0.46-0.50 mm.

Remarks: morphologically related forms from the Cenozoic of China have been referred to the genus *Eucypris* by many Chinese authors (Hou *et al.*, 1978, 1982).

Indet. Cypridacea sp. 4
(Pl. 2, figs. 3, 4)

Dimensions: L = 0.96 – 0.98.

Remarks: the same as for Cypridacea sp. 3.

3. Conclusions

1) The ostracod association from Silveirinha comprises the following species (absence of loose valves hampers generic attribution of some):

Iliocypris lusitanicus n. sp.
Cyclocypris ? sp.
Cypria ? sp.
Cypris silveirinhaensis n. sp.
Indet. Cypridacea sp. 1
Indet. Cypridacea sp. 2
Indet. Cypridacea sp. 3
Indet. Cypridacea sp. 4.

2) The most diagnostic species are *Ilyocypris lusitanicus* n. sp.and *Cypris silveirinhaensis* n. sp.

3) The presence of *Cypris silverinhaensis* n. sp. suggests an Eocene age as this species is very closely related to: *Cypris* sp., described by Tambareau *et al.*, 1991 from the Ilerdian of Southern France; *Cypris pseudodecaryi* Guernet, 1981 from the Sparnacian of the Paris Basin; and *Cypris henanensis* Guan & Sun, 1978, from the Eocene of China.

4) The Silveirinha's association of ostracods clearly points out to limnic environments.

5) The same association seems compatible with intertropical conditions.

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Plate 1

1, 2, 4, 8 – *Ilyocypris lusitanicus* n. sp.

1. Carapace, left view, x 80.
2. Carapace, right view, holotype, x 80.
4. Carapace, dorsal view, x 80.
8. Carapace, dorsal view, slightly tilted, x 80.

3, 5-7 – *Cypris silveirinhaensis* n. sp.

3. Carapace, ventral view, x 40.
5. Carapace, right view, holotype, x 45.
6. Carapace, left view, x 40.
7. Carapace, right view, x 45.

9, 10 – Indet. Cypridacea sp. 1

9. Carapace, male, right view, x 70.
10. Carapace, female, right view, x 70.

PLATE 1

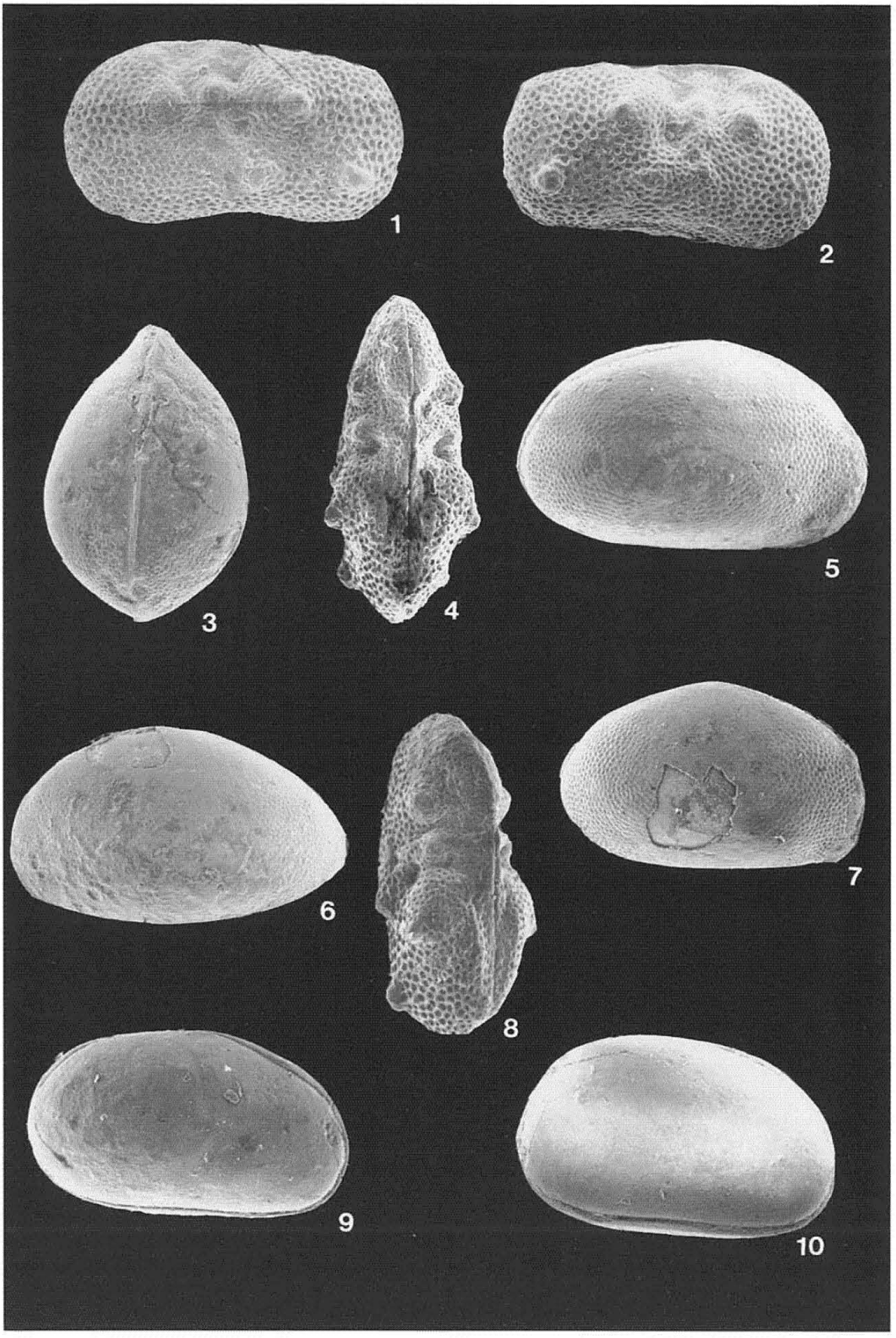

Plate 2

1, 2 – Indet. Cyprideacea sp. 1

1. Carapace, female left view, x 80.
2. Cararapace, female, right view, x 80.

3-4 – Indet. Cypridacea sp. 2

3. Carapace, male, right view, x 60.
4. Carapace, female, right view, x 80.

5 – Indet. Cypridacea sp. 3.

Carapace, right view, x 40.

6 – Indet. Cypridacea sp. 4

Carapace, left view, x 40.

7, 9, 10 – *Cypria* sp.

7. Carapace, right view, x 115.
9. Carapace, left view, x 115.
10. Carapace, right view, x 130.

8 – *Cyclocypris* ? sp.

Carapace, right view, x 80.

PLATE 2