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Charophytes from Silveirinha (?Upper Paleocene – Lowermost Eocene) according to Janine Riveline

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Résumé

Mots-clés: Silveirinha; Portugal; Charophytes; Sparnacien; Eocène basal.

Les résidus de lavage-tamisage de sédiments en provenance de l'important gisement de Silveirinha (bas Mondego, Portugal, ?Paléocène supérieur ou Eocène basal) sont riches en gyrogonites. Tout le matériel de Charophytes a été soumis à Janine Riveline, qui a reconnu une seule forme, *Nitellopsis (Tectochara) dutemplei* (Watelet) Grambast & Soulié-Märsche *minor* Riveline. Cette forme a été récoltée dans les marnes lacustres situées au dessus du Conglomérat de Cernay, riche en vertébrés d'âge thanétien terminal. Sur la base de cette forme de Charophyte l'âge de ces sédiments est interprétées comme sparnacien (non basal), zone à *Peckichara disermas.*

Abstract

Key-words: Silveirinha; Portugal; Charophytes; Sparnacian; lowermost Eocene.

Charophytae gyrogonites are common among the washing/ sieving residues from the important ?upper Paleocene or lowermost Eocene site of Silveirinha (lower Mondego, Portugal). The whole Charophyte material has been submitted to Janine Riveline, who recognized but *Nitellopsis (Tectochara) dutemplei* (Watelet) Grambast & Soulié-Märsche *minor* Riveline. This form has been found in the lacustrine marls overlying the "Conglomérat de Cernay" that is rich in late Thanetian vertebrates. Taking into account the presence of the above referred form, the age of the concerned sediments may be (not basal) Sparnacian, *Peckichara disermas* Charophyte zone.

Charophyte gyrogonites are very common in the sediments from Silveirinha, a locality that yielded a rich mammalian fauna (Antunes *et al.*, 1997) among other fossils: ostracods, mollusks, and many vertebrates. The gyrogonites have been referred since the earliest papers on Silveirinha (Antunes, 1981, p. 256; Antunes & Russell, 1981, p.1100).

Charophytae are important as fossils. Their chronostratigraphic role is of great interest in Tertiary times. Hence the presence of gyrogonites, common among the washing-sieving concentrates from Silveirinha, aroused our interest.

A more accurate study was needed. M. Telles Antunes proposed it to Mme. Janine Riveline, then at the Laboratoire de Géologie des Bassins sédimentaires, Université Paris VI. Our colleague accepted to identify the charophytes. Accordingly, gyrogonites were sent her (July, 1998).

The same year (September 23th) she communicated M.T.A. the first results: "Il s'agît surement d'un représentant du genre *Nitellopsis*, sous genre *Tectochara*, très proche de ce que j'ai reconnu comme *N. (T.) dutemplei minor* dont le niveau type se situe dans les Marnes à rognons de la sablière Mouras (Mont-de-Berru, Marne)"; "Ces niveaux sont Éocène basal".

Still new gyrogonite specimens were subsequently sent. However, no new forms were identified. As a conclusion, all the charophyte gyrogonites collected until now belong to:

Nitellopsis (Tectochara) dutemplei (Watelet) Grambast & Soulié-Märsche *minor* Riveline, whose type level is the "Marnes à rognons de la sablière Mouras", lowermost Eocene.

This form has been found in the lacustrine marls over the "Conglomérat de Cernay", that yielded a rich vertebrate fauna ascribed to the uppermost Thanetian. On the basis of this charophyte species, age of the concerned level has been interpreted as (not lowermost) Sparnacian and corresponding to the *Peckichara disermas* Charophyte zone (Riveline, 1984).

In a later synthesis (Riveline *et al.*, 1996, p.461) the *Peckichara disermas* zone is defined as the "Interval from the first occurrence of *Peckichara disermas* Grambast, 1977 to the first occurrence of *Peckichara piveteaui* Grambast, 1977". Age: Late Thanetian, – i.e., Late Paleocene. The zone is correlated with the top of NP9 and the base of NP10 in North European basins (id., p.462) or lowermost Ypresian (id., fig.4). Age is around 55 Ma (ibid.).

Let us remark that *Nitellopsis (Tectochara)* also occurs at Le Quesnoy (Oise, France), a fossil-rich locality in the "Argiles à lignite du Soissonnais", Sparnacian, Early Eocene – lower Ypresian, MP7 mammal-unit (see NEL *et al.*, 1999). Age is therefore very close to that of Silveirinha.

Owing to the very narrow scope of the results and especially the lack of any further evidence, our colleague Riveline did not produce any text on this matter. On the other hand, results are indeed very interesting, even if the locality had been accurately dated by mammals. Indeed, no charophytes were known in association with the Silveirinha's mammalian fauna nor in the Eocene of Portugal. We therefore decided to ensure the divulgation of the available results, not to postpone it any more.

It should be stressed that one of the ostracods from the same locality, *Cypris* n. sp., is closely similar to other species from the same age: - *Cypris* sp. Tambareau *in* Tambareau *et al.* (1991), from the Ilerdian of Montagne Noire; and – *Cypris pseudodecaryi* Guernet, 1981, from the Paris Basin Sparnacian (see Colin & Antunes, 2003, this volume).

Conclusions

The whole evidence allows the following conclusions:

- the Charophyte gyrogonites from Silveirinha occur in rather large numbers;
- a single form, *Nitellopsis (Tectochara) dutemplei* (Watelet) Grambast & Soulié-Märsche *minor* Riveline is represented;
- This form points out to the *Peckichara disermas* zone, Late Thanetian or lowermost Ypresian (a matter of stratigraphic limits, age being anyway around 55 Ma);
- the age of Silveirinha as suggested by Charophytes is compatible either with Late Paleocene, as indicated by stratigraphic correlation with Pyrenean region as well as by the somewhat earlier-than Doormal mammals (even if the Silveirinha mammalian fauna has been ascribed to the same MP7 mammal-unit, whose type site is Doormal); or with Lowermost Eocene.

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Plate 1

Nitellopsis (Tectochara) dutemplei (Watelet) Grambast & Soulié-Märshe *minor* Riveline

Gyrogonites

The two upper rows: lateral views.
The third row: basal views.
Bottom row: apical view.

SEM photographs by J. Pais, Centro de Estudos Geológicos (UNL).

PLATE 1