Cuadernos Geología Ibérica	Vol. 8	Págs. 195-218	Madrid 1982

PRELIMINARY ACCOUNT OF MIDDLE CRETACEOUS OSTRACODS FROM SEGOVIA AND GUADALAJARA PROVINCES (SPAIN)

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ABSTRACT:

A provisional account of ostracod associations of the Turonian and Coniacian of the provinces of Segovia and Soria is given. The affinities of the associations lie most closely with southwestern France (Provence), as indicated particularly by species of the genera *Mauritsina, Risaltina, Dolocytheridea, Dordoniella, Veeniacythereis?, Paracaudites* and *Neocythere.* Previous assertions by earlier workers concerning North African affinities with the Mid-Cretaceous ostracods of northern Spain could not be verified.

RESUMEN:

Se han estudiado algunas asociaciones de Ostrácodos procedentes de cinco secciones (Turoniense - Coniaciense) de las provincias de Segovia y Guadalajara. Hasta ahora, se han determinado más de 20 especies. Las especies presentes son propias de aguas poco profundas. Las asociaciones del Turoniense presentan relaciones con las de Francia, pero no tienen muchas especies en común con la cuenca Vasco-Cantábrica, ni con Portugal, ni con el Norte de Africa. En general, el aspecto de las asociaciones es diferente del de las regiones adyacentes: hay solamente escasos casos de identidad específica que sea tal vez un reflejo de reacciones ecofenotípicas (o posiblemen-

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te fases distintas de desarrollo). Las asociaciones permiten caracterizar la edad Turoniense (medio o superior?) de los cortes de Carabias, Moral de Hornuez y Somolinos (Turoniense Inferior?) y la edad Coniaciense de la sección de Castrojimeno. La asociación de Ostrácodos del Turoniense está caracterizada principalmente para las especies *Veeniacytheresis? begudensis, Dordoniella* aff. *turonensis, Dolocytheridea crassa, Risaltina aquitanica, Pterygocythereis allinensis, Cythereis? damottae, Paracaudites colini,* y *«Rehacythereis» galvensis.* La asociación del Coniaciense contiene *Mauritsina speciosa, «Rehacythereis» guadalajarensis* y *Trachyleberidea* spp. Finalmente notamos que el fuerte control ecológico es en gran parte responsable de las distribuciones verticales de las distintas especies, mientras que las distribuciones laterales de las especies son, ante todo, estables (igualdad de las faunas de Carabias y Moral de Hornuez).

INTRODUCTION

The material described in the present report was partly collected by Dr. A. ALONSO MILLAN and partly by R. A. and E. R. REYMENT during the field season of 1980. The details of the Cretaceous geology of Segovia Province has been treated in detail by ALONSO MILLAN (1981), to which work the reader is referred for the necessary background to this note. The sections of particular interest in the present connexion are denoted Castrojimeno, Moral de Hornuez and Carabias-Bercimuel (hereinafter referred to as Carabias) in the aforementioned publication. In addition, the Turonian sequence at Somolinos was sampled.

The following faunal lists are based on the determinations accounted for in the systematic section of this paper.

SOMOLINOS (Turonian)

Risaltina aquitanica Colin & Grekoff
Cythereis? damottae Swain.

MORAL DE HORNUEZ (Turonian)

Dolocythere crassa Damotte
Dordoniella aff. *turonensis* Damotte
Pterygocythereis allinensis (Grekoff & Deroo)
Pterygocythereis sp. nov.
Veeniacythereis? aff. *begudensis* Babinot
Veeniacythereis? aff. *damottae* (Colin)
«Rehacythereis» sp. indet.

Paracaudities colini Babinot
Trachyleberidea arta Breman *non* Damotte
Nucleolina sp. nov.

CARABIAS (Turonian)

Dolocythere crassa Damotte
Dordoniella aff. *strangulata* Apostolescu
D. aff. *turonensis* Damotte
Neocythere (Physocythere) aff. *verbosa* (Damotte)
Veeniacythereis? aff. *begudensis* Babinot
«*Rehacythereis*» *galvensis* Breman
Limburgina aff. *damottae* Babinot
Neocyprideis vandenboldi Gerry & Rosenfeld?

CASTROJIMENO (Coniacian to Santonian?)

«*Rehacythereis*» *guadalajarensis* Breman
Trachyleberidea sp. nov.
Trachyleberidea geinitzi (Reuss)?
Mauritsina speciosa Babinot.

Affinities of the associations: The regional relationships of the above associations are close to those of southwestern France (Provence). BABINOT (1980, p. 486) observed that the associations described by him from Provence were totally different from those of the Maghreb. Of interest is the fact that *Megacytheropteron berbericum* seems to occur in both Portugal and North Africa (BABINOT *et al.*, 1978; BABINOT, 1980). As regards the Spanish associations recorded by SWAIN (1978), GREKOFF and DEROO (1956) and BREMAN (1976), suggested agreements with North Africa do not appear to be well founded and in no single case could I substantiate claims of specific identity. The palaeobiogeographical significance of this observation has yet to be fully evaluated, but it is possible to postulate tentatively at this early stage of our knowledge that the Iberian Peninsula and southwestern France (at least) must have formed a different ostracodal province from that of the Maghreb. There is as yet only slight evidence for migrations of ostracod species from one province to the other, a fact which may not be without importance for interpretations of the geological evolution of the western Tethys during the Mid-Cretaceous.

ACKNOWLEDGEMENTS

I am greatly indebted to Dr. A. GARCIA QUINTANA for interesting me in the problem outlined in this paper and to Dr. A. ALONSO

MILLAN for providing invaluable material for analysis and for supplying all documentation necessary for carrying out the project. Dr. J.-F. BABINOT has most generously supplied comparative material from his collections from southwestern France, without which it would not have been possible to determine several of the forms discussed in this report. I am also grateful to Dr. J.-P. COLIN for critical reading of the manuscript and for suggesting several improvements. EVA REYMENT performed the SEM photography of the illustrated material and also gave invaluable assistance in the field.

This paper is a contribution to IGCP project 58 «Mid-Cretaceous Events». The work was supported by Grant G2320-109 of the Swedish Natural Science Research Council.

SYSTEMATIC NOTES

General remarks

Locally, ostracods are extremely abundant at the localities covered by this preliminary report. Species of *Cytherella* and *Bairdia* often make up the most important part of these associations. For the purposes of the present paper, the taxonomical status of the several species of these genera has been left untreated. The preservation of almost all of the material available is poor, an exception being provided by a sample from Moral de Hornuez. The shells of most specimens are recrystallized, and not infrequently, dolomitized and it has therefore not been possible to observe all pertinent internal features of the shells.

Family Cytherideidae Sars
Genus *Dolocytheridea* Triebel

Dolocytheridea crassa Damotte

Pl. 3, Figs. 13-16.

Full synonymy supplied by BABINOT (1980).

Remarks

Dolocytheridea crassa Damotte is one of the more common species of the present collection. BABINOT (1980) placed the species in one of the subgenera of Gründel, namely *Puracytheridea*, said to be dis-

tinguished by minor variations in hinge structure; this taxonomic unit is not used here. *D. crassa* seems to have been first recorded from northern Spain as *Dolocytheridea*? aff. *bosquetiana* by GREKOFF and DEROO (1956).

An undescribed species of *Dolocytheridea* occurs in the Coniacian associations from Castrojimeno.

Occurrence

Carabias, Moral de Hornuez. Turonian.

Genus *Dordoniella* Apostolescu

Dordoniella aff. *strangulata* Apostolescu

Plate 2, Fig. 14.

Remarks

D. strangulata Apostolescu occurs typically in the Cenomanian, whereas the present material derives from Turonian deposits. BABINOT (1980) has, however, recorded *D.* aff. *strangulata* from Santonian beds. The present material has several properties in common with *D. strangulata,* but differs particularly in regard to the outline of the shell. Bearing in mind BABINOT'S (1980) comments on salinity effects on the shell of *Dordoniella,* it is highly desirable that some of the species of the genus be analyzed in the light of the work of BARKER (1963).

Occurrence

Carabias. Turonian.

Dordoniella aff. *turonensis* Damotte

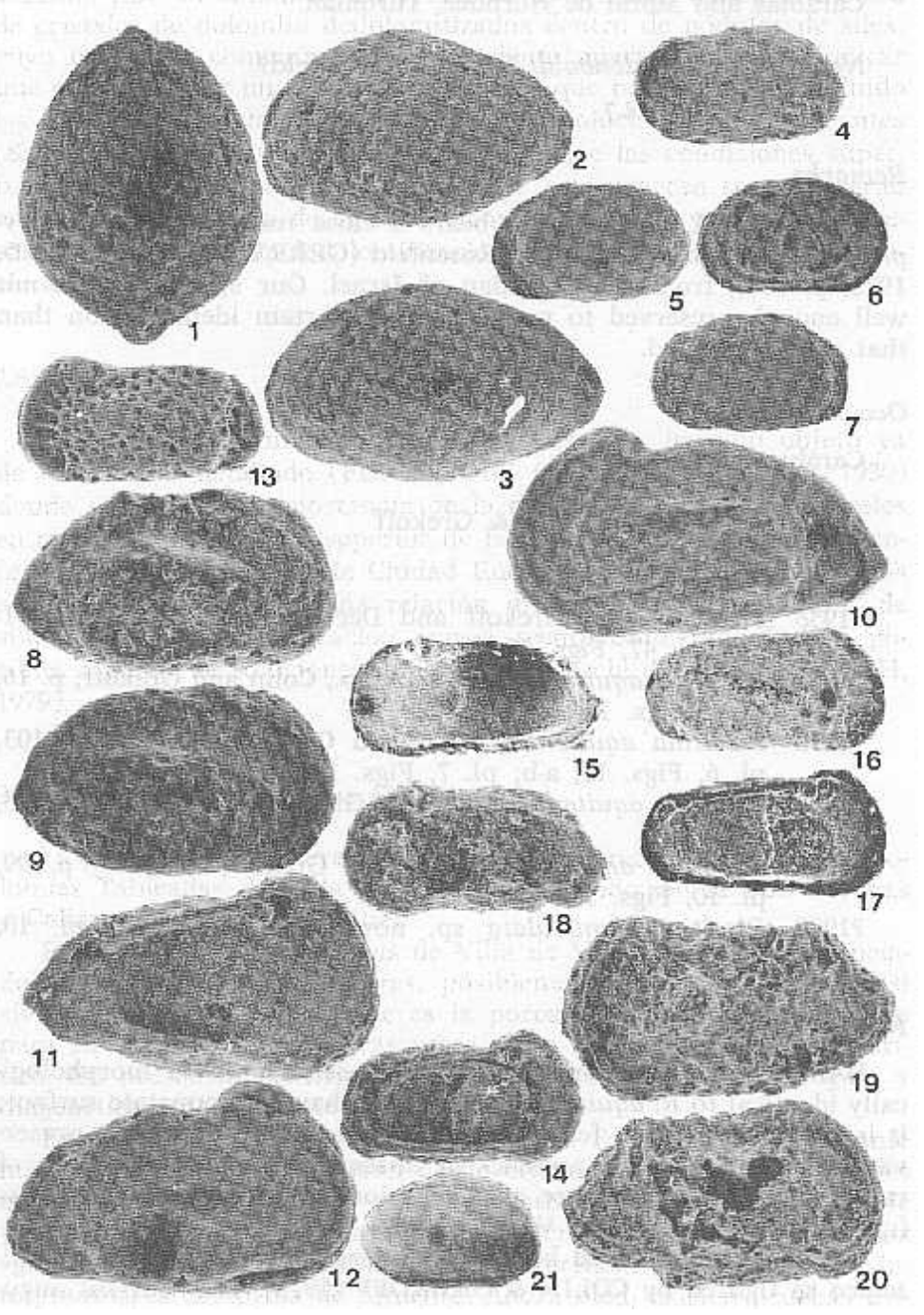
Plate 2, Figs. 12, 13, 15.

Remarks

As in the case of the foregoing species, the present material cannot be exactly identified with *Dordoniella turonensis* Damotte, largely on admittedly slight differences in the outline of the shell. In particular, the carapaces of the material recorded here tend to be more arched along the dorsal margin, although the differences in relation to the type material of *D. turonensis* are too elusive to allow of an easy solution.

PLATE 1

1. *Neocythere (Physocythere)* aff. *verbosa* (Damotte). Turonian, Carabias. × 70. PMSpa20.
2. Same species and provenance. × 70. PMSpa20.
3. Same species and provenance. × 70. PMSpa21.
4. *Neocyprideis vandenboldi* Gerry and Rosenfeld?, Turonian, Carabias. × 70. PMSpa22.
5. Same species and provenance. × 70. PMSpa23.
6. Same species and provenance. × 70. PMSpa24.
7. Same species and provenance; internal view of a right valve. × 70.
8. *Veeniacythereis?* aff. *begudensis* (Babinot). Turonian, Carabias. × 70. PMSpa26.
9. Same species, Moral de Hornuez, Turonian. × 70. PMSpa27.
10. Same species and provenance. × 70. PMSpa28.
11. Same species, Carabias, Turonian. Internal aspect of a left valve. × 70. PMSpa29.
12. Same species and provenance. × 70. PMSpa30.
13. *Limburgina* aff. *damottae* Babinot. Turonian, Carabias. × 38. PMSpa31.
14. Same species and provenance. Internal view of right valve (containing a moult of *Cytherella* sp.). × 38. PMSpa32.
15. Same species and provenance. Internal view of a right valve. × 38. PMSpa32.
16. «*Rehacythereis*» *galvensis* Breman. Turonian, Carabias. × 38. PMSpa34.
17. Same species and provenance. × 38. PMSpa35.
18. Same species and provenance. × 38. PMSpa36.
19. *Cythereis? damottae* Swain. Turonian, Somolinos. × 70. PMSpa37.
20. Same species and provenance. × 70. PMSpa38.
21. *Dordoniella?* sp. Turonian, Carabias. × 38. PMSpa39.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Occurrence

Carabias and Moral de Hornuez, Turonian.

Neocyprideis vandenboldi Gerry & Rosenfeld?

Plate 1, Figs. 4-7.

Remarks

The material referred here bears a close resemblance to *Neocyprideis vandenboldi* Gerry and Rosenfeld (GERRY and ROSENFELD, 1972, p. 103), from the Turonian of Israel. Our specimens are not well enough preserved to permit a more certain identification than that now attempted.

Occurrence

Carabias, Turonian.

Risaltina aquitanica Colin & Grekoff

Plate, 3, Figs. 17-19.

1956 Podocopa sp., Grekoff and Deroo, pp. 225-226; pp. 231-232, pl. 47, Figs. 25-28.
1973 *Risaltina aquitanica* n. gen. n. sp., Colin and Grekoff, p. 16, pl. 1, Figs. 1-8.
1976 *Risaltina aquitanica* Colin and Grekoff, Breman, p. 103, pl. 6, Figs. 13, a-b; pl. 7, Figs. 13, 1-c.
1978 *Risaltina aquitanica* Colin and Grekoff, Swain, p. 257, pl. 3, Figs. 1-3.
1980 *Risaltina aquitanica* Colin and Grekoff, Babinot, p. 99, pl. 10, Figs. 1-3.
?1980 *Risaltina denticulata* sp. nov., Babinot, p. 99, pl. 10, Figs. 4-10.

Remarks

BABINOT'S (1980) species *Risaltina denticulata* is morphologically identical to *R. aquitanica,* apart from having a punctate surface; it is possible that this feature is of ecologic origin or even a preservational character. The presence or absence of denticules is also of rather doubtful significance as a criterion of taxonomic distinctness (cf. REYMENT and VAN VALEN, 1969).

The material recorded here is doubtless conspecific with *R. aquitanica* as figured by COLIN & GREKOFF (1973). The «ressaut angu-

laire» is usually strongly developed. The earlier age assignations of the species seem to be exclusively Cenomanian (GREKOFF and DEROO (1956) with reference to a locality called Burgo de Osma). BABINOT (1980) also referred the species to the Cenomanian. BREMAN (1976) recorded the species from the Lower Turonian and Cenomanian of Guadalajara and SWAIN (1978, p. 257) referred his material from Nava (Asturias) to the Turonian.

Occurrence

Somolinos, Turonian.

Family Progonocytheridae Bradley.
Genus *Neocythere* Mertens
Subgenus *Physocythere* Kaye

Neocythere (Physocythere) aff. *verbosa* (Damotte)

Pl. 1, Figs. 1-3.

Remarks

Our material is identical with that figured by BABINOT (1980, p. 108). It is probably a new species, as there are rather clear distinctions from *N. (P.) verbosa* (Damotte), both with respect to ornament and shape in dorsal aspect.

Occurrence

Carabias, Turonian.

Family Brachycytheridae Puri

Subfamily Pterygocythereidinae Puri

Pterygocythereis allinensis (Grekoff and Deroo)

Plate 2, Figs. 17-18; Plate 3, Figs. 7-9.

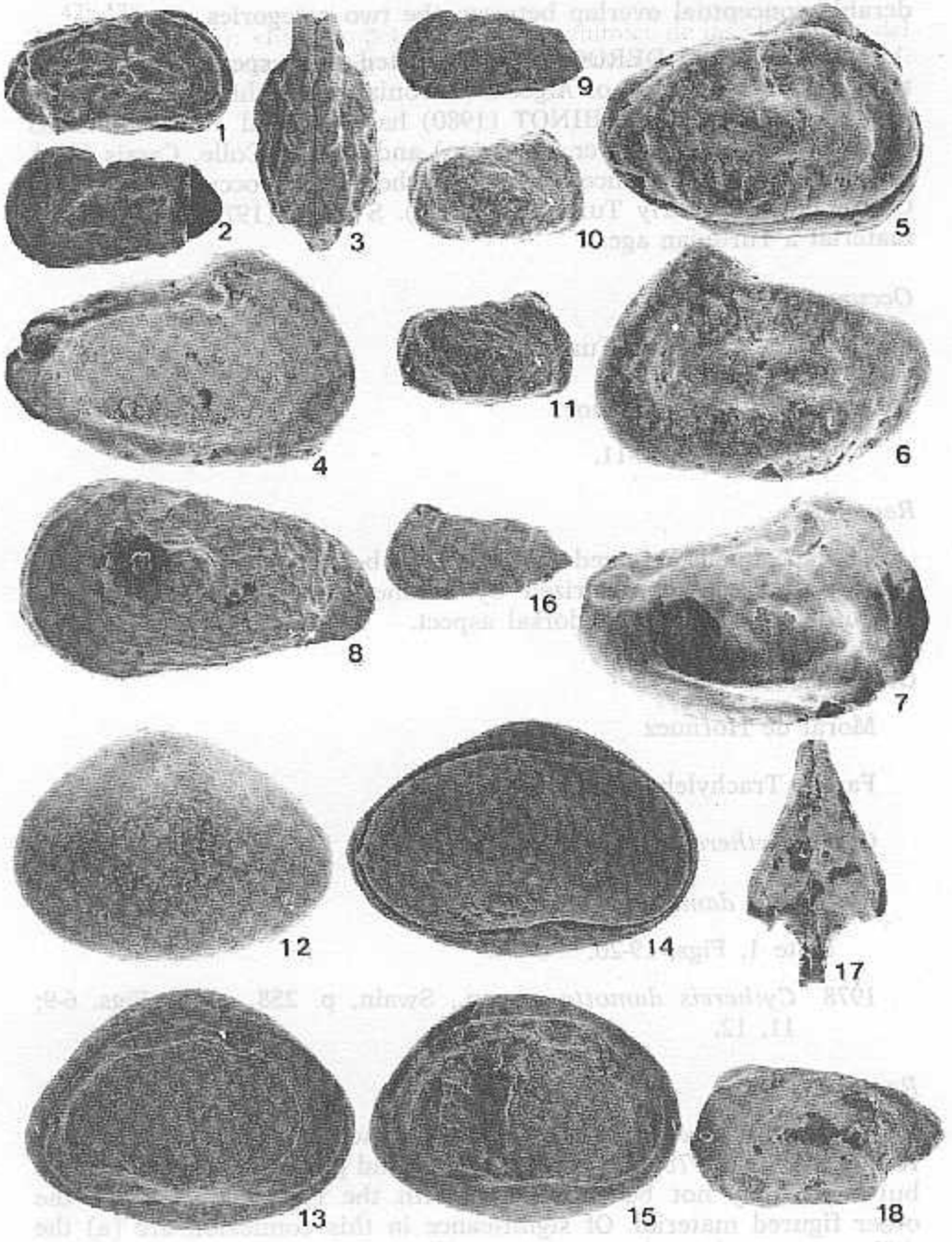
1956 *Alatacythere allinensis* n. sp., Grekoff and Deroo, pp. 221 (229), pl. 47, Figs. 34-35.
1978 *Pterygocythere allinensis* Grekoff and Deroo, Swain, p. 255, pl. 2, Figs. 3-5.

Remarks

SWAIN'S (1978) figures agree with the material recorded here. The species *P. rati* Damotte seems to be similar with respect to general morphological characteristics. BABINOT (1980) has attempted to stabilize the nomenclature for *Pterygycythere* and *Pterygocy-*

PLATE 2

1. *Mauritsina speciosa* Babinot. Conician, Castrojimeno. × 38. PMSpa40.
2. Same species and provenance. × 38. PMSpa41.
3. Same species and provenance. × 38. PMSpa42.
4. *Veeniacytheris?* aff. *damottae* (Colin). Turonian, Moral de Hornuez. × 70. PMSpa43.
5. Same species and provenance. × 70. PMSpa44.
6. Same species and provenance. × 70. PMSpa45.
7. Same species and provenance. Interior aspect of a left valve showing the adductor muscle field. × 70. PMSpa46.
8. *Trachyleberidea* sp. nov. Coniacian, Castrojimeno. × 70. PMSpa47.
9. *Paracaudites colini* Babinot. Turonian, Moral de Hornuez. × 38. PMSpa48.
10. *Nucleolina* sp. nov. Turonian, Moral de Hornuez. × 38. PMSpa49.
11. Same species and provenance. × 38. PMSpa50.
12. *Dordoniella* aff. *turonensis* Damotte. Turonian, Carabias. ×70. PMSpa51.
13. Same species and provenance. × 70. PMSpa52.
14. *Dordoniella* aff. *strangulata* Apostolescu. Turonian, Carabias. × 70. PMSpa53.
15. *Dordoniella* aff. *turonensis* Damotte. Turonian, Carabias. × 70. PMSpa54.
16. *Trachyleberidea geinitzi* (Reuss)? Coniacian, Castrojimeno. × 38. PMSpa55.
17. *Pterygocytheris allinensis* (Grekoff & Deroo). Turonian, Moral de Hornuez. × 38. PMSpa56.
18. Same species and provenance. × 38. PMSpa57.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thereis with only a partial degree of success, for there is still considerable conceptual overlap between the two categories.

GREKOFF and DEROO (1956) reported their species to occur in the Constantine region of Algeria (Turonian), but this claim has still to be substantiated. BABINOT (1980) has recorded *P.* cf. *allinensis* from Pas d'Ouiller (Lower Turonian) and Pas de Colle, Cassis (Middle Turonian) in Provence. The age of the original occurrence is Late Cenomanian to Early Turonian (Soria). SWAIN (1978) assigned his material a Turonian age.

Occurrence

Moral de Hornuez, Turonian.

Pterygocythereis sp. nov.

Plate 3, Figs.10-11.

Remarks

The specimens referred here seem to belong to a new species of *Pterygocythereis* characterized by rimmed alae and a trapezoidal shape of the carapace in dorsal aspect.

Occurrence

Moral de Hornuez

Family Trachyleberidinae Bradley

Genus *Cythereis* Jones

Cythereis? damottae Swain

Plate 1, Figs. 19-20.

1978 *Cythereis damottae* n. sp., Swain, p. 258, pl. 3, Figs. 6-9; 11, 12.

Remarks

The material referred here resembles two of the specimens figured by SWAIN (1978, pl. 3, Figs. 8 and 9) and placed in his new species but these may not be conspecific with the type and most of the other figured material. Of significance in this connexion are (a) the differences in lateral ornament and (b) the great posterior variability.

The recent revisions of the cytherid ostracods have left us in such a state of uncertainty that it is not possible to assign many Mid-Cretaceous species to a genus entirely on unchallengeable grounds. Thus the present species could equally well qualify for admission into *Limburgina* (which would create a problem of synonymy), *Oertliella*, as well as other genera. SWAIN (1978) gave no information on the internal characters of his species so for the time being, I have retained his generic assignation, although not without doubt.

Occurrence

Somolinos, Turonian.

Genus *Veeniacythereis* Gründel

Veeniacythereis? aff. *begudensis* (Babinot)

Plate 1, Figs. 8-12.

1971 *Cythereis ? begudensis* n. sp., Babinot, p. 240, pl. 2, Figs. 3-9; pl. 3, Fig. 1.
1976 *Cornicythereis mdaouerensis* (Bassoullet & Damotte), Breman, p. 113, pl. 4, Figs. 19, a-b.
1980 *Cythereis ? begudensis* Babinot, Babinot, p. 21, pl. 16, Figs. 1-10.

Remarks

Babinot does not agree with GRUNDEL'S (1973) assignation of his species to the incompletely known and understood genus *Veeniacythereis*. The species was originally recorded from the Cenomanian, but BREMAN'S (1976) material is said to be from the Turonian. The forms referred by Breman to *V. ? mdaouerensis* (Bassoullet & Damotte) are not morphologically so close to that species as they are to that considered here. *Veeniacythereis ? damottae* (Colin) is somewhat similar to our material with respect to lateral morphology and the development of the dorsal margin; however, it differs markedly in the development of the posterior sector of the carapace (see COLIN, 1974, p. 26).

Occurrence

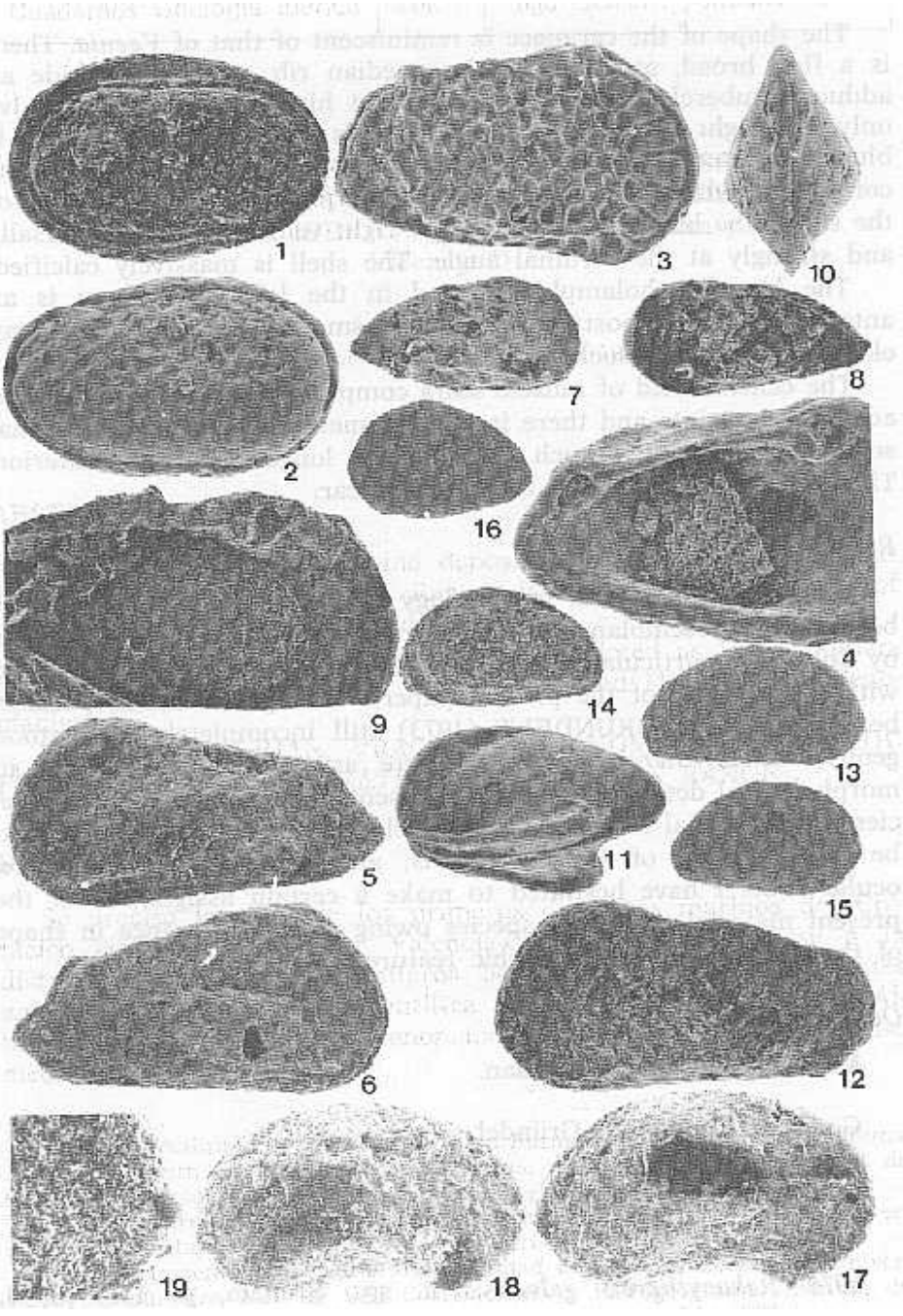
Moral de Hornuez and Carabias. Turonian.

Veeniacythereis ? aff. *damottae* (Colin)

Plate 2, Figs. 4-7.

PLATE 3

1. *Cytherella* sp. Turonian, Carabias. × 70. PMSpa1.
2. *Cytherella* sp. Coniacian, Castrojimeno. × 70. PMSpa2.
3. «*Rehacythereis*» *guadalajarensis* Breman. Coniacian. Castrojimeno. × 70. PMSpa3.
4. Same species and provenance. Internal view of a left valve. × 70. PMSpa4.
5. *Trachyleberidea arta* Breman *non* Damotte. Turonian, Carabias. × 70. PMSpa5.
6. Same species, Turonian, Moral de Hornuez. × 70. PMSpa6.
7. *Pterygocythereis allinensis* Grekoff & Deroo. Turonian, Moral de Hornuez. × 38. PMSpa7.
8. Same species and provenance. × 38. PMSpa8.
9. Same species and provenance. × 38. PMSpa9.
10. *Pterygocythereis* sp. nov. Turonian, Moral de Hornuez. × 38. PMSpa10.
11. Same species and provenance. × 38. PMSpa11.
12. «*Rehacythereis*» sp. Turonian, Moral de Hornuez. × 70. PMSpa12.
13. *Dolocytheridea crassa* Damotte. Turonian, Carabias. × 70. PMSpa13.
14. Same species and provenance. × 70. PMSpa14.
15. Same species and provenance. × 70. PMSpa15.
16. Same species and provenance. × 70. PMSpa16.
17. *Risaltina aquitanica* Colin & Grekoff. Turonian, Somolinos. × 70. PMSpa17.
18. Same species and provenance. × 70. PMSpa18.
19. Same species and provenance. View of the anteroventral tubercle. × 260. PMSpa19.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Description

The shape of the carapace is reminiscent of that of *Veenia*. There is a flat, broad, at times stubby, median rib, which may hide an adductor tubercle. There is a prominent hinge-ear in the left valve only, the right valve entirely lacking this feature. The posterior is bluntly pointed. The anterior rim borders a broad, flat furrow, the contour of which is reflected in the morphology of the interior of the shell. The left valve overlaps the right ventrally, postero-dorsally and strongly at the cardinal angle. The shell is massively calcified.

The hinge is holamphidont and in the left valve there is an anterior socket, a postjacent tooth, a smooth median bar and an elongated posterior socket.

The central field of muscle scars comprises four vertically placed adductor imprints and there is an asymmetrically V-shaped antennal scar, the posterior branch of which is longer than the anterior. There is a thin, elongated mandibular scar.

Remarks

In general shape and morphology of the left valve, this species bears a close resemblance to the form figured as *Hazelina ? damottae* by Colin (see particularly COLIN, 1974, pl. 8, Fig. 10 to be compared with Pl. 2, Fig. 6 of the present paper). The species seems perhaps better located in GRUNDEL'S (1973) still incompletely understood genus *Veeniacythereis,* although there are marked differences in morphological details between the present material and the type species. Our material lacks an eye tubercle, one of the features said to be characteristic of *Veeniacythereis,* although there is a narrow ocular tube. I have hesitated to make a certain assignation of the present material to Colin's species owing to the difference in shape of the right valves (a dimorphic feature?).

Occurrence

Moral de Hornuez, Turonian.

Genus *Rehacythereis* Gründel

«*Rehacythereis*» *galvensis* Breman

Plate 1, Figs. 16-18.

1976 *Rehacythereis galvensis* n. sp., Breman, p. 111, pl. 8, Figs. 16, a-c.

Remarks

Despite certain minor morphological differences, possibly the outcome of modes of preservation, the material here referred to «*R.*» *galvensis* seems to agree with Breman's species (note particularly the bialveolor structure of the right anterior hinge element - cf. BREMAN, 1976, pl. 8, Fig. 16b). BREMAN *(op. cit.)* recorded his type material from the Molina Formation of Cenomano-Turonian age. He compared it with *Cythereis algeriana* Bassoullet & Damotte from North Africa.

GRUNDEL'S (1973) genus *Rehacythereis* was based on rather vague and tenuous criteria, many of which are of no more than infraspecific validity within the group in question (cf. DAMOTTE, 1977). It seems to me to be an artificially construed taxonomic unit but, for the time being, I have retained the name on a very provisional basis.

Occurrence

Carabias. Turonian.

«*Rehacythereis*» *guadalajarensis* Breman

Plate 3, Figs. 3-4.

1976 *Rehacythereis guadalajarensis* sp. nov., Breman, p. 112, pl. 9, Figs. 17, a-c.

Remarks

The material referred to Breman's species agrees well with the original illustrations. BREMAN (1976, p. 112) stated the species to be very abundant in his material from the Lower Turonian sediments of the Molina Formation. Rather remarkable is his observation that among the many hundreds of individuals he identified as belonging to *R. guadalajarensis,* only a very few specimens were adults!

Occurrence

Castrojimeno, Coniacian.

«*Rehacythereis*» sp. indet.

Plate 3, Fig. 12.

Remarks

A poorly preserved individual is provisionally placed in «*Rehacythereis*».

Occurrence

Moral de Hornuez, Turonian.

Genus *Paracaudites* Deltel

Paracaudities colini Babinot

Plate 2, Fig. 9.

1980 *Paracaudites (Paracaudites) colini* nov. sp., Babinot, p. 144, pl. 23, Figs. 7-14.

Remarks

The Segovian material seems to accord well with some of the figures published by BABINOT (1980). *Paracaudities* has an external morphology similar to *Trachyleberidea*. The holotype comes from the Upper Turonian of Provence and it is also known from sediments of the same age in Dordogne. BABINOT *op. cit.*, p. 146) provisionally referred a form from the Algerian Coniacian to his species.

Occurrence

Moral de Hornuez, Turonian.

Genus *Trachyleberidea* Bowen

Trachyleberidea arta Breman *non* Damotte

Plate 3, Figs. 5-6.

Remarks

Notwithstanding the fact that BABINOT (1980, p. 157) accepted BREMAN'S (1976) specific assignation of material from North Central Spain, the morphological differences between the Spanish material and Damotte's species seem to me to be too great for inclusion in the French form. Our material differs from Babinot's interpretation of *T. arta* (BABINOT, 1980, p. 154) in that it possesses a median rib. The question arises as to whether our material could be referable to the Turonian species *Trachyleberidea praetexta* (Damotte), a question which must remain unanswered for the present.

Occurrence

Moral de Hornuez, Turonian.

Trachyleberidea sp. nov.

Plate 2, Fig. 8.

Remarks

The specimens assigned here cannot be identified more satisfactorily as the internal details of the carapace are unknown. It is just possible that they are moults.

Occurrence

Castrojimeno, Coniacian.

Trachyleberidea geinitzi (Reuss)?

Plate 2, Fig. 16.

Remarks

The material here tentatively referred to *T. geinitzi* is generally similar to the specimens placed in this species by BABINOT (1980, pl. 27, Figs. 3-13) but with the significant difference that the cardinal angle of our form is more prominent.

Occurrence

Castrojimeno, Coniacian.

Genus *Mauritsina* Deroo

Mauritsina speciosa Babinot

Plate 2, Figs. 1-3.

1980 *Mauritsina speciosa* nov. sp., Babinot, p. 175, pl. 32, Figs. 1-6.

Remarks

The material referred here agrees well with BABINOT'S (1980) species from the Coniacian of Provence. The similarly ornamented (shagreen surface texture) *M. hieroglyphica* (Bosquet) appears to reach a smaller adult size. *Mauritsina ? soriensis* (GREKOFF & DEROO) differs quite considerably in ornament and dorsal shape.

Occurrence

Castrojimeno, Coniacian.

Genus *Limburgina* Deroo

Limburgina aff. *damottae* Babinot

Plate 1, Figs. 13-15.

Remarks

L. damottae is an Upper Santonian species. The Segovian material bears a resemblance to BABINOT'S (1980, p. 191) species and may be conspecific. The hinge is holamphidont and the main ornamental features are comparable with those of *L. damottae,* but further material is required before a definite determination is possible.

Occurrence

Carabias, Turonian.

Incertae Sedis

Genus *Nucleolina* Apostolescu

Nucleolina sp. nov.

Plate 2, Figs. 10-11.

Remarks

The specimens referred to *Nucleolina* are similar (but probably not identical with) an unnamed species figured by BABINOT (1980), but differ in the morphology of the anterior and posterior zones.

Occurrence

Moral de Hornuez, Turonian.

LA ESTRATIGRAFIA DE LAS LOCALIDADES

Somolinos

Según las asociaciones de Ammonites en mi colección procedentes del corte de Somolinos, la edad de los Ostrácodos debe ser Turoniense, tal vez Turoniense Inferior. La fauna de Ammonites contiene especies de los géneros *Fallotites, Pseudaspidoceras,* y *Coilopoceras.* En una serie de margas y calizas se han encontrado las especies:

Cythereis ? damottae Swain
Risaltina aquitanica Colin & Grekoff

R. aquitánica se encuentra en la «Formación de Molina» de BREMAN (1976) y en los materiales de Nava descritos en la publicación de SWAIN (1978). La región típica de la especies está en el suroeste de Francia. En lo que concierne la paleoecología del corte de Somolinos, esta asociación, junto con otras formas, indica una facies de poca profundidad. Notamos que la parte terminal del Turoniense marino no está representada a Somolinos; en su lugar hay una formación de arenas que pueden, posiblemente, pertenecer al Turoniense Superior. La serie marina de Somolinos y de la región considerada de Segovia forman parte de la transgresión tectónico-eustática mundial del Cenomaniense Superior-Turoniense Inferior.

Moral de Hornuez

Aquí también la edad del corte es Turoniense. Las especies siguientes han sido encontradas en las margas en la carretera a Fuentidueña.

Trachyleberidea ? sp. indet.
Paracaudites sp.
Dolocytheridea crassa Damotte

En la columna de Moral, el Turoniense Medio (?) contiene los Ostrácodos siguientes (el nivel 20 de ALONSO (1981)).

Veeniacythereis ? aff. *begudensis* Babinot
Veeniacythereis ? aff. *damottae* (Colin)
Dolocytheridea crassa Damotte
Dolocytheridea sp. indet.
«*Rehacythereis*» sp. indet.
Pterygocythereis allinensis (Grekoff & Deroo)
Pterygocythereis sp. nov.
Dordoniella aff. *turonensis* Damotte
Nucleolina sp. nov.
Paracaudites colini Babinot

Las condiciones ambientales parecen ser las mismas que las de Somolinos y Carabias, es decir, ambiente de plataforma.

Carabias-Bercimuel

Los Ostrácodos de esta área indican probablemente que tenemos una edad Turoniense, tal vez Turoniense Superior, pero esta deter-

minación es menos segura. Los Ostrácodos son bastante abundantes en dos niveles del corte, pero aparecen también en otros niveles.

El nivel superior contiene las formas siguientes.

Cytherella spp.
Bairdia sp.
«*Rehacythereis*» *galvensis* Breman
Veeniacythereis ? aff. *begudensis* Babinot
Dolocytheridea crassa Damotte
Dolocytheridea ? sp.
Neocyprideis vandenboldi Gerry & Rosenfeld?
Neocythere (Physocythere) aff. *verbosa* (Damotte)
Dordoniella aff. *strangulata* Apostolescu
D. aff. *turonensis* Damotte
Limburgina aff. *damottae* Babinot

El nivel inferior contiene las especies:

«*Rehacythereis*» *galvensis* Breman
Neocythere (Physocythere) aff. *verbosa* (Damotte)
Dolocytheridea crass Damotte

El nivel 16 de ALONSO (1981) ha dado las formas siguientes:

Paracaudities colini Babinot
Paracaudites sp. nov.
Amphicytherura ? sp. indet.
Neocyprideis vandenboldi Gerry & Rosenfeld?
Veeniacythereis ? aff. *begudensis* (Babinot)
Limburgina aff. *damottae* Babinot

Notamos la ausencia de *Dolocytheridea* en esta asociación.

Castrojimeno

La edad de la serie del corte de Castrojimeno debe ser Coniaciense-Santoniense, según los Amonites (ALONSO, 1981). Los Ostrácodos son abundantes: entre otros contienen las margas

Cytherella spp.
Dolocytheridea ? sp.
Pterygocythereis sp. nov.
Mauritsina speciosa Babinot
«*Rehacythereis*» *guadalajarensis* Breman

La aparición de *Mauritsina speciosa* tiene gran interés para la interpretación de la paleobiogeografía. Vemos que las afinidades de todas las asociaciones mencionadas en este trabajo son con las faunas del suroeste de Francia. Son pocas las afinidades con Africa del Norte. Parece que trata de dos provincias biológicas diferentes de Ostrácodos, una abarcando Francia y la Península Ibérica, y la otra en el Africa septentrional.

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