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New Early Cretaceous weevil taxa from Spain (Coleoptera, Curculionoidea)

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ABSTRACT

New genera *Distenorrhinoides* (type species *D. simulator* n.sp.) and *Microbrenthorrhinus* (type species *M. martinezi* n.sp.) (Nemonychidae, Brenthorrhininae) are described as well as the new species *Brenthorrhinoides lacasai* (Nemonychidae), *Gobicar hispanicus* and *Cretonanophyes rugosithorax* (Eccoptarthridae).

Keywords: Coleoptera. Curculionoidea. Nemonychidae. Eccoptarthridae. Lower Cretaceous. Spain. Taxonomy. Paleontology.

INTRODUCTION

The published information on European Mesozoic weevils is scarce (Zherikhin and Gratshev, 1997). From the Lower Cretaceous of Spain only two species have been named up to now (Whalley and Jarzembowski, 1985; Zherikhin and Gratshev, 1997). Through the kindness of Dr. X. Martínez-Delclòs, Barcelona, we have had an opportunity to study a new and more representative collection of weevils from the Lower Cretaceous of the Montsec Range, Lleida Province. The collection in hands includes several new taxa and provides a possibility to compare between the Early Cretaceous faunas of East Asia and Europe which is important in several respects as discussed below.

The fossiliferous deposits of Sierra Montsec are known for a long time since the early works of Vidal (1899, 1902), Meunier (1902), Zeiller (1902), and Sauvage (1903). The history of palaeontological investigations and collections is summarized by Lacasa (1991), Martínez-Delclòs and Ruíz de Loizaga (1991), and Gómez-Alba (1991). Geological and stratigaphical data on the Mesozoic sediments in this area were outlined by Schairer and Jänicke (1970), Peybernès and Oertli (1972), Mercadé (1991), and Fregenal-Martínez and Meléndez (1995). Insect remains occur in the so-called "Calcaires lithographiques à Plantes et Vertébrés de la Pedrera de Rúbies" , a layer of a finely laminated carbonaceous mudstone forming a part of the "Calcaires à Charophytes du Montsech". The weevils described below have been collected at the "La Cabrua" site together with numerous other insects (both terrestrial and aquatic), crustaceans, fishes, and plant macrofossils (Martinell et al., 1991). The age of the deposits once estimated as Late Jurassic (Vidal, 1902) is unquestionably Early Cretaceous (Late Berriasian to Early Valanginian according to Peybernès and Oertli, 1972, and Brenner et al., 1974, Late Hauterivian to Early Barremian according to Martín-Closas and López-Morón, 1995, or even Barremian to Aptian according to Ansorge, 1993). The mudstones have been accumulated in a lacustrine envi-

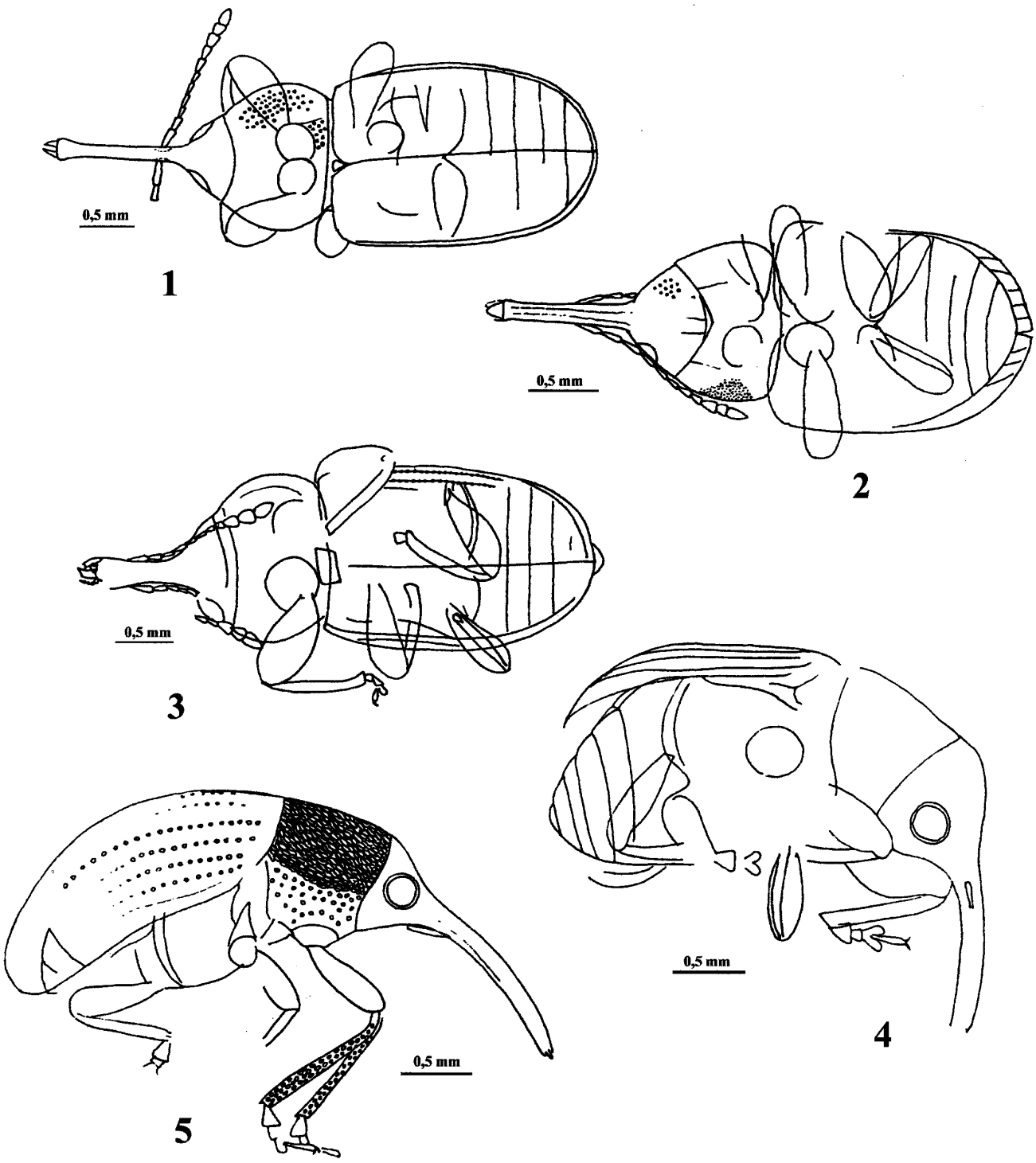

Figure 1. Combined drawing of the holotypes based on both part and counterpart. 1.- *Distenorrhinoides simulator* GRATSHEV AND ZHERIKHIN n.gen., n.sp., LC-2031-IEI; 2.- *Microbrenthorrhinus martinezi* GRATSHEV AND ZHERIKHIN n.gen., n.sp., LC-2220-IEI; 3.- *Brenthorrhinoides lacasai* GRATSHEV AND ZHERIKHIN n.gen., n.sp., LC-1374-IEI; 4.- *Gobicar hispanicus* GRATSHEV AND ZHERIKHIN n.gen., n.sp. LC-4669-IEI; 5.- *Cretonanophyes rugosithorax* GRATSHEV AND ZHERIKHIN n.gen., n.sp., LC-1653-IEI=LC-1654-IEI (part and counterpart).

ronment, and most probably in a deep-water, unoxygenated central part of a lake (Martínez-Delclòs and Martinell, 1993; Martínez-Delclòs and Ruíz de Loizaga, 1993).

All specimens studied are deposited in the Institut d'Estudis Ilerdencs (I.E.I.), Lleida, Spain. The fossils are generally rather well preserved except for the sculpture which is often hardly recognizable on coalified remains of the beetle cuticle. However, when the cuticle is lost the fine carbonate matrix demonstrates many delicate details of both structure and sculpture as impressions. The fossils have been studied under the binocular microscopes MBS-9 (both dry and wetted with alcohol) and MPS-2 (with polarized light).

TAXONOMY

Order: Coleoptera

Family: Nemonychidae BEDEL, 1882
Subfamily Brenthorrhininae L.ARNOLDI, 1977
(Arnoldi, in: Arnoldi et al., 1977: 119)

The subfamily has been revised recently (Gratshev and Zherikhin, 1995). After the revision, the first Early Cretaceous member of this extinct lineage known previously only from the Upper Jurassic has been described, namely *"Brenthorrhinus" longidigitatus* REN from the Xishan Mountains near Beijing, China (Ren, 1995). According to the English version of original description and drawings this species should be indeed a member of Brenthorrhininae but its generic placement is certainly wrong; it may represent rather *Distenorrhinus* L. ARNOLDI or a related undescribed genus. Three genera are represented in the material from La Cabrua indicating that the subfamily were much more diverse in the Early Cretaceous than it seemed previously.

GENUS ***Distenorrhinoides*** n.gen.

Generic name: From the genus *Distenorrhinus*. Gender masculine.

Type species: Distenorrhinoides simulator n.sp.

Diagnosis: Body elongate oval, 4 mm long. Rostrum slender, barely widened at apex, nine times as long as its apical width and much longer than pronotum. Labrum shape unknown. Mandibles symmetrical, narrow, wedge-shaped, not toothed, a little shorter than apical width of rostrum. Antennae inserted in basal one fourth of rostrum, not reaching base of prothorax, slender; first two antennal joints (scape and 1st joint of funicle) slightly thickened, third slender, last joint of funicle widened; antennal club indistinctly separated from funicle, narrow, acuminate. Head transverse; frons wider than base of rostrum; eyes large, lateral in position; temples short, diverged backwards. Pronotum widest behind its mid-length, with strongly rounded lateral sides, not constricted apically, broader than long; lateral carina probably distinct; hind margin of prothorax almost straight, fore margin of prothorax ventrally distinctly concave. Forecoxae postmedial in position. Mid-coxae not enlarged. Hind coxae distinctly narrowed outward. Elytra elongate, parallel-sided, broadly rounded at apex, with shoulders subrectangular and only slightly rounded. Forefemora not or weakly thickened. Foretibiae widened. Structure of tarsi unknown.

Composition: Monobasic.

Comparison: The genus is unique among the Brenthorrhininae in the antennal insertion placed within the basal fourth of rostrum. This state is certainly an apomorphy justifying a creation of a separate genus. In general, *Distenorrhinoides* resembles *Distenorrhinus* L. ARNOLDI and *Megabrenthorrhinus* GRATSHEV AND ZHERIKHIN in combining long rostrum with postmedial position of the forecoxae but differs from the both besides the antennal insertion in having two (and not only one) first antennal joints thickened. The second joint is widened in *Pseudobrenthorrhinus* GRATSHEV AND ZHERIKHIN as well but the latter genus is very different from *Distenorrhinoides* not only in the position of forecoxae but also in other important characters such as the shape of the mandibles, the antennal club distinctly separated from the funicle, and the rostrum being much shorter. In fact, the structure of the base of antennae is also different because in *Pseudobrenthorrhinus* three, and not two, basal joints are thickened very strongly, much more so than in *Distenorrhinoides*. *Distenorrhinoides* is more similar to *Distenorrhinus* than to *Megabrenthorrhinus* but this similarity is based mostly on symplesiomorphies such as the lateral position of the eyes, the elongate elytra, and the midcoxae not enlarged. However, the widened foretibiae occuring also in some *Distenorrhinus* (the subgenus *Parabrenthorrhinus* GRATSHEV AND ZHERIKHIN) may indicate a common evolutionary trend based on the common genetic basis (an underlying synapomorphy: Saether, 1979).

The key to genera of the Brenthorrhininae (Gratshev and Zherikhin, 1995, pp. 114-115) should be modified as follows to include the genus:

7'. Antennae inserted in basal fourth of rostrum; 1st joint of funicle as wide as scape; last joint of funicle widened, antennal club not sharply separated from it… . . . . . .*Distenorrhinoides* n.gen.

- Antennae inserted more distally; 1st joint of funicle distinctly less wide than scape; last joint of funicle not widened, club distinctly separated from it 7

Distenorrhinoides simulator n.sp.
Figure 1.1

Specific name: Simulator, Latin, an imitator.

Holotype: LC-2031-IEI A, B, positive and negative impressions of nearly complete beetle.

Description: Body dark brown, rostrum, antennae and legs more pale. Body probably bare. Rostrum parallel-sided except for weak widening at the very apex, 9 times longer than broad at apex, 1.5 times as long as pronotum. Antennae inserted in one fourth of length of rostrum from its base, reaching hind margin of forecoxae. Scape slightly incrassate, 2.8 times as long as broad and 1.5 times as long as first joint of flagellum. Funicular joint 1 slightly narrower than scape, 1.7 times as long as broad, 2 to 4 slender, subequal, 1.5 time as long as broad than wide, 5 to 7 slightly longer than 4, longer than broad, gradually widening, 7 almost as broad as joint 1 of club and 1.3 times longer than broad. Antennal club slightly longer than three last joints of funicle combined, its joint 1 1.2 times longer than broad, subconical, 2 1.2 times shorter than 1, slightly transverse, 3 as wide as 2 and 1.4 times as long as it, egg-shaped, acuminate at apex. Eyes longer than base of rostrum wide; temples shorter than eyes, strongly diverged backwards. Pronotum widest slightly behind midlength, distinctly more narrowed forward than backward, 1.6 times broader than long, rather coarsely and not densely punctate; base of pronotum 1.5 times broader than apical. Scutellum longer than broad, narrow, rounded at apex. Elytra parallel-sided, 2.5 times as long and 1.2 times as broad as pronotum, 1.5 times longer than broad; their sculpture not observable at the holotype. Forefemora slightly more thick than mid-pair; foretibiae curved. Dimensions in mm: body length 4.0 (rostrum excluded).

Material: Holotype, LC-2031-IEI.

GENUS ***Microbrenthorrhinus*** n.gen.

Generic name: after *micros*, Greek, small, and the genus *Brenthorrhinus*. Gender masculine.

Type species: Microbrenthorrhinus martinezi n.sp.

Diagnosis: Body broadly oval, about 3 mm long. Rostrum slender, nearly parallel-sided, about six times as long as its apical width and much longer than pronotum. Labrum large, elongate. Shape of mandibles unknown. Antennae inserted near midlength of rostrum, not reaching base of prothorax, slender; first antennal joint (scape) hardly thickened; antennal club narrow, acuminate, distinctly separated from funicle. Head large, transverse; frons wide; eyes small, almost lateral in position; temples short, diverged backward. Pronotum widest near its base, with weakly rounded lateral sides, not constricted apically, broader than long; lateral carina probably distinct; hind margin of prothorax weakly convexely arcuate, fore margin deeply concave. Forecoxae large, medial in position. Mid-coxae not enlarged. Hind coxae distinctly narrowed outward. Elytra broad, parallel-sided, broadly rounded at apex, with shoulders subrectangular and only slightly rounded. Forefemora not thickened. Structure of tibiae and tarsi unknown.

Composition: Monobasic.

Comparison: The genus is similar to *Distenorrhinus*, *Distenorrhinoides* n.gen. and *Megabrenthorrhinus* in combining the median position of the forecoxae with the long rostrum. It agrees with *Distenorrhinus* and *Distenorrhinoides* n.gen. in small body size as well as in having the midcoxae not enlarged and the eyes placed laterally (both states are certainly plesiomorphic) while in the narrow antennal club, the rostrum virtually not widened at apex and the broad elytra (all probably apomorphic) it closely resembles *Macrobrenthorrhinus*. The deeply concave fore margin of prothorax (probably connected with an oblique resting position of the head and rostrum) and the enlarged labrum are autapomorphic. Thus *Microbrenthorrhinus* n.gen. may represent a sister group to *Macrobrenthorrhinus*.

The key to genera of the Brenthorrhininae (Gratshev and Zherikhin, 1995, pp. 114-115) should be modified as follows to include the genus:

12. Body more than 5 mm long, broadly oval; head distinctly transverse, with eyes placed anterolaterally; midcoxae strongly enlarged . . . .*Megabrenthorrhinus.*

- Body less than 5 mm long, or, if not, strongly elongate and narrow; eyes lateral in position; midcoxae of normal size . . . . . .12'

12'. Body broadly oval; antennal club very narrow, fusiform; rostrum hardly widened apically . . . . . .*Microbrenthorrhinus* n.gen.

- Body oval to narrowly oval; antennal club more broad, suboval; rostrum distinctly widened at apex . . . . . .*Distenorrhinus*

Microbrenthorrhinus martinezi n.sp.
Figure 1.2

Specific name: After Dr. X. Martínez-Delclòs.

Holotype: LC-2220-IEI A-B, positive and negative impressions of nearly complete beetle.

Description: Body very dark, antennae and apical third of rostrum pale. Body probably bare. Rostrum parallel-sided except for the broader base and very weak widening at the very apex, 8 times longer than broad at apex, 1.6 times as long as pronotum. Antennae inserted in one third of length of rostrum from its base, reaching hind margin of forecoxae. Scape slender, 4.5 times as long as broad and 1.4 times as long as first joint of flagellum. Funicular joints 1 to 4 subequal, about as wide as scape, 5.5 times as long as broad; 5 to 7 nearly 1.5 times shorter and slightly wider than 4, about 1.5 times as long as broad. Antennal club slightly but distinctly wider than funicular joint 7, slightly longer than three last joints of funicle combined; its joint 1 1.3 times longer than last funicular joint and 1.6 times longer than broad, subconical; joint 2 as long as 1, subcylindrical; joint 3 as long as 2 and 3 combined, 3 times as long as broad, acuminate at apex. Eyes about as longer as base of rostrum wide; temples as long as eyes, strongly diverged backwards. Head rather coarsely punctate, distance between points less than their diameter. Pronotum widest at base, regularly and very slightly rounded narrowed up to apical margin, about 1.5 times broader than long, very coarsely and sparsely punctate, distance between points not less than their diameter; base of pronotum 1.5 times broader than apical margin, hind angles subrectangular, slightly rounded. Shape of scutellum unknown. Elytra parallel-sided, 2.3 times as long and 1.3 times as broad as pronotum, 1.4 times longer than broad, rather finely punctately striate. Dimensions in mm: body length 2.7 (rostrum excluded).

Material: Holotype LC-2220-IEI.

GENUS ***Brenthorrhinoides*** GRATSHEV AND ZHERIKHIN 1995
Gratshev and Zherikhin, 1995: 119.

A new species from Spain is similar to the Late Jurassic species described earlier in all essential generic features except for strongly thickened fore femora and a very weak subapical constriction at prothorax which seems to be lacking in other species. Those differences seem to be too weak to justify a creation of a new genus. Besides the characters mentioned below, the unique specimen from La Cabrua demonstrates structure of the maxillary palps which was not known for other members of the genus. The palps are long, slender and flexible, of a type normal for the subfamily. Mesonotum probably lacking any stridulatory files. This character which is important in the high-level taxonomy of the family has already been established with certainty for *Procurculio fortipes* L. ARNOLDI (Gratshev and Zherikhin, 1995) but not for other members of the subfamily.

Brenthorrhinoides lacasai n.sp.
Figure 1.3

Specific name: After Mr. A. Lacasa-Ruíz (Institut d'Estudis Ilerdencs, Lleida).

Holotype: LC-1374-IEI A-B, positive and negative impressions of nearly complete beetle; dorsal surface is unclear while ventral surface seen as an imprint in the rock is well observable.

Description: Body dark brown, apical part of rostrum and antennae except club somewhat more pale. Body probably smooth and bare; in any case, no distinctive sculpture or pubescence can be seen at the holotype except for rugosity on fore coxae and punctate striae on elytra. Rostrum narrowed forward at short distance from base, weakly widened at apex, 4 times longer than broad at apex, hardly longer than pronotum. Mandibles rather stout. right mandible with obtuse tooth at outer edge before apex, left mandible with small acute tooth at apex of inner edge. Antennae inserted in one third of length of rostrum from its apex, slightly exceed midlength of prothorax. Scape incrassate, 1.5 times as broad and almost 2

times as long as first joint of flagellum. Funicular joints slender, 1st to 6th subequal, twice longer than wide, 7th shorter and slightly wider, but still distinctly longer than wide. Antennal club half as long as fore tibia, slightly longer than last four funicular joints combined, loose and broad; its joint 1 triangular, about 1.3 times as long as wide; joint 2 rounded, as long as broad; joint 3 as wide as second and 1.5 times as long as it, egg-shaped, acuminate at apex. Frons broad; eyes about as long as base of rostrum wide; temples much shorter than eyes, strongly diverged backwards. Pronotum widest near midlength, hardly more narrowed forward than backward, 1.6 times broader than long; base of pronotum feebly convexely arcuate, hardly broader than apical margin; prothorax ventrally with very weak subapical constriction. Shape of scutellum unknown. Forecoxae postmedial in position, large, globose, rather coarsely and densely, slightly transversally rugosely punctate. Elytra parallel-sided, 3 times longer and about as broad as pronotum, approximately 1.5 times longer than broad, finely punctately-striate, points in striae small, distant; intervals broad, probably impunctate. Forefemora strongly thickened; foretibiae hardly shorter than femora, slender, nearly straight, only at very apex slightly curved inwards. Foretarsi short, narrow, with two first joints subequal, third joint deeply bilobed. Mid- and hind femora as long as fore pair but much more narrow. Mid- and hind tibiae slender, nearly straight, slightly shorter than femora. First joint of hind tarsi about as long as broad. Dimensions in mm: body length 3.8 (rostrum excluded).

Material: Holotype LC-1374-IEI.

Comparison: The strongly incrassate forefemora seem to be unique within the genus but it may be a sexual character. Rostrum is slightly longer than pronotum as in *B. mandibularis* GRATSHEV AND ZHERIKHIN but the latter species has the submedial forecoxae and a regular row of distinct points at each elytral interval. The pronotum in the new species is widest about its midlength and not behind it as in other known *Brenthorrhinoides*; in this respect *B. robustus* GRATSHEV AND ZHERIKHIN with the maximal pronotal width only slightly behind midlength is more close to *B. lacasai* n.sp. than any other species. The elytra in *B. lacasai* n.sp. are more elongate than in other congeners. The asymmetrical mandibles with the different teeth at the right and left mandible are also characteristic.

Family: Eccoptarthridae L.ARNOLDI, 1977
Tribu: Eccoptarthrini L.ARNOLDI
Arnoldi et al., 1977: 169

Eccoptarthridae: (*sensu* Zherikhin and Gratshev, 1997). This group is treated here in accordance with Zherikhin and Gratshev (1997) as a separate family; see Zherikhin and Gratshev (1997) and Gratshev and Zherikhin (1999) for its further synonymy and generic composition. Previously one monotypic genus of this family, *Jarzembowskia* ZHERIKHIN AND GRATSHEV 1997, has been known from Montsec Range; a new species of another genus is described below.

GENUS ***Gobicar*** GRATSHEV AND ZHERIKHIN 1999

Gobicar hispanicus n.sp.
Figure 1.4

Specific name: After Spain, the country of origin.

Holotype: LC-4669-IEI B, negative impression of nearly complete beetle preserved in ventrolateral aspect.

Description: Body dark, rostrum, tibiae and tarsi paler. Body probably bare or nearly so. Rostrum at base less thick than forefemur, subcylindrical, about 8 times as long as high at place of antennal insertion, about 0.8 times as long as pronotum, in lateral view moderately and regularly arcuate. Antennae inserted in one fourth of length of rostrum from its base. Scape slender, rather short, far not reaching anterior margin of eye. Structure of funicle and club unknown. Eyes round, lateral in position, distinctly longer than base of rostrum thick; temples rather long but shorter than eyes. Frons moderately convex, very broad. Head without distinct sculpture. Pronotum widest probably at hardly bisinuate base, dorsally nearly flat, without distinct sculpture. Elytra probably subparallel-sided, about twice as long as pronotum, probably flat or slightly convex dorsally, not raised at basal margin, distinctly but finely striate; striae not disappearing to apex, points in striae indistinct; intervals much wider than striae, flat, without distinct sculpture. Legs rather stout. Femora moderately incrassate. Foretibiae straight, about as long as femora, impunctate. Foretarsi 1.5 times shorter than tibiae, joint 1 large, triangular, at straight apical margin as wide as apex of tibia, as long as broad, as long as two following joints combined; joint 2 2.0 times narrower and 2.0 times shorter than 1st, only slightly widened to apex; joint 3 as wide and as long as 1, distinctly bilobate; onychium long and slender, 1.7 times as long as joint 3; claws free, long. Mid- and hind femora shorter than fore pair, not incrassate. Hind tibiae about as long as femora. Hind tarsi with joint 1 large, triangular, as long as broad;

joint 2 probably much smaller than 1; joint 3 about as long and as wide as 1, distinctly bilobate. Meso- and metathorax without distinct sculpture. Abdomen without distinct sculpture, ventrite 1 slightly longer than others, with acuminate triangular intercoxal process. Dimensions in mm: body length 3.3 (rostrum excluded).

Material: Holotype LC-4669-IEI B.

Comparison: The new species differs from *G. pono - marenkoi* GRATSHEV AND ZHERIKHIN in the rostrum more stout and the sculpture of dorsal surface much less coarse.

Remarks: Some important characters such as the tibial spurs are not observable on the holotype, and the generic placement is tentative. The poorly preserved weevil specimen illustrated at the figure 18 in Whalley and Jarzembowski (1985) and at the figure 3 in Zherikhin and Gratshev (1997) may represent the same species.

GENUS ***Cretonanophyes*** ZHERIKHIN 1977
Zherikhin, in Arnoldi et al., 1977, 178.

Cretonanophyes rugosithorax n.sp.
Figure 1.5

Specific name: After a characteristic rugose sculpture of the prothorax.

Holotype: LC-1653-IEI and LC-1654-IEI, positive and negative impressions of nearly complete beetle.

Description: Body very dark, antennae, rostrum (especially in apical half), tibiae and tarsi (except for dark claws) pale. Body probably bare or nearly so. Rostrum at base as thick as forefemur, gradually become less thick to apex, 8,7 times as long as high at place of antennal insertion, 1.6 times as long as pronotum, in lateral view moderately and regularly arcuate, in basal three fourth with lateral carina. Antennae inserted in one fifth of length of rostrum from its base. Scape long, slender, not reaching anterior margin of eye. Structure of funicle and club unknown. Eyes round, lateral in position, about as longer as base of rostrum thick; temples rather long but shorter than eyes. Frons moderately convex, rather broad. Head without distinct sculpture. Pronotum widest probably at moderately bisinuate base, gently and regularly longitudinally convex, very coarsely and densely, longitudinally rugosely punctate, points elongate, distance between them much less than their width. Ventral side of prothorax rather finely and very sparsely punctate, points round. Shape of scutellum unknown. Elytra probably suboval, 2.3 times as long as pronotum, moderately and regularly longitudinally convex forming common arc with pronotum, not raised at basal margin, distinctly punctately striate, striae not disappearing to apex, points in striae rather large, round, distance between them no less than their diameter; intervals wider than striae, flat, without distinct sculpture. Legs long, slender. Femora not incrassate. Foretibiae distinctly curved at base, 1.3 times as long as femora, with distinct apical spur, coarsely and rather densely punctate. Foretarsi 1.6 times shorter than tibiae, 1st joint large, triangular, at straight apical margin slightly wider than apex of tibia, 1.5 times as long as broad, as long as two following joints combined; 2nd joint 1.9 times narrower and 2.5 times shorter than 1st, only slightly widened to apex; 3rd joint wider and slightly longer than 2nd, distinctly bilobate; onychium long and slender, 2 times as long as 3rd joint; claws free, rather large. Mid femora shorter, hind femora about as long as fore pair. Hind tibiae slightly longer than femora, with two apical spurs. Hind tarsi with 1st joint large, 1.7 times as long as broad, 1.5 times wider and 2.3 times longer than 2nd. Meso- and metathorax without distinct sculpture. Abdomen 1.2 times as long as metathorax, without distinct sculpture, 1st ventrite longer than others, with acuminate triangular intercoxal process. Dimensions in mm: body length 2.4 - 2.7 (rostrum excluded).

Material: Besides the holotype, the paratypes LC-4226-IEI A and B (positive and negative impressions of a complete but rather poorly preserved beetle), LC-4233-IEI A (a rather poorly preserved negative impression of a nearly complete beetle in ventrolateral position), and LC-4541-IEI A (a rather well preserved negative impression of a nearly complete beetle in lateral position); the latter is smaller than other specimens (2.4 mm long) but similar with them in all other important characters seen.

Comparison: The new species differs clearly from *C. longirostris* ZHERIKHIN in the smaller size, the longer temples, the coarsely and rugosely punctate pronotum, the less convex pronotum and elytra forming a common arc in lateral view, and the shorter 1st ventrite.

Remarks: The new species resembles *C. longirostris* in some important characters, first of all in the position of antennal insertion, the length of the antennal scape and the long, slender tibiae distinctly curved at base. On the other hand the relatively long temples, the continuous

dorsal outline of the pronotum and the elytra without any basal elytral declivity, and the shorter 1st ventrite are different and may be of a generic value. So *C. rugosithorax* n.sp. is placed to *Cretonanophyes* with some reservation, and perhaps a separate genus will be established for it in future when more species will be known.

DISCUSSION

The importance of Montsec as one of very few localities of mesozoic weevil fossils known in Europe has been stressed by Zherikhin and Gratshev (1997). Up to now the Jurassic weevils are known exclusively from the warm (probably subtropical) Euro-Chinese Region while the Early Cretaceous ones are described mainly from the cooler Siberian Region (the names of Mesozoic palaeofloristic regions after Vakhrameev, 1988) so it is difficult to say which differences between the Jurassic and Cretaceous assemblages are connected with the age of the faunas and which should be explained rather by biogeographical reasons. The new data on the Montsec Cretaceous weevils are of a great interest in this respect because the area was situated in the early Cretaceous times within the Euro-Chinese subtropical belt.

The weevil fauna of Montsec includes now 7 named species belonging to 7 genera and 3 families as follows:

Nemonychidae: *Distenorrhinoides simulator* GRATSHEV AND ZHERIKHIN n.gen., n.sp. (1 specimen), *Microbrenthorrhinus martinezi* GRATSHEV AND ZHERIKHIN n.gen., n.sp. (1 specimen), *Brenthorrhinoides lacasai* GRATSEV AND ZHERIKHIN n.sp. (1 specimen);

Belidae: *Montsecbelus solutus* (WHALLEY AND JARZEMBOWSKI 1985) (1 specimen);

Eccoptarthridae: *Gobicar hispanicus* GRATSHEV AND ZHERIKHIN n.sp. (1 or 2 specimens), *Cretonanophyes rugosithorax* GRATSHEV AND ZHERIKHIN n.sp. (4 specimens), *Jarzembowskia edmundi* GRATSHEV AND ZHERIKHIN 1997 (1 specimen).

All species are restricted to the Montsec fauna. At the generic level *Brenthorrhinoides* was previously known only from the Upper Jurassic of Kazakhstan, *Gobicar* from the Upper Jurassic of Mongolia, and *Cretonanophyes* from the Lower Cretaceous of Siberia; two latter genera are identified in Montsec with some reservation. Four genera are not found anywhere outside Montsec; among them *Distenorrhinoides* n.gen. and *Microbrenthorrhinus* n.gen. are closely related to the genera described from the Upper Jurassic of Kazakhstan, *Jarzembowskia* resembles the Late Early Cretaceous (Albian) genus *Emanrhynchus* ZHERIKHIN from the Russian Far East (Gromov et al., 1993) while *Montsecbelus* seems to be rather isolated taxonomically. At the family level, the Belidae are common and diverse in the Upper Jurassic of Kazakhstan but seem to be very rare in the Lower Cretaceous of the North Hemisphere; now the family is restricted to the subtropical and temperate areas of southern continents. The Nemonychidae are diverse and numerically dominating in the Upper Jurassic of Kazakhstan; in the Lower Cretaceous they are found in England, Siberia, Mongolia, China, and Brazil but in a relatively small numbers. Nowadays the family is distributed in temperate and subtropical areas of both North and South Hemispheres but absent in the tropics. Finally, the Eccoptarthridae are rare in the Upper Jurassic of Kazakhstan and Mongolia; in the Lower Cretaceous they are very numerically abundant but rather poor in species in Siberian and Mongolian localities. The living members of the family are restricted to Australia and temperate South America.

The Montsec assemblage demonstrates some similarities both with the Euro-Chinese Jurassic and the Siberian Cretaceous faunas. It is numerically dominated by eccoptarthrids like the Siberian and Mongolian Lower Cretaceous assemblages but the diversity of the family in Spain seem to be higher. Thus the rarity of eccoptarthrids in the Upper Jurassic of Kazakhstan and Mongolia should be explained rather by the age than by climatic factors. The rarity of belids indicates that the decline of the family was a common feature of the Early Cretaceous faunas at least at the northern continents. On the other hand, the diversity of nemonychids in Montsec is surprisingly high, and their rarity in the Siberian Cretaceous should be connected with a cooler climate rather then with the age of the fauna.

Some families of weevils known from other Lower Cretaceous localities (Anthribidae, Attelabidae, Ulyanidae, Brentidae, Curculionidae: Gromov et al., 1993, and unpublished data) are not found in Montsec; however, they generally form minor components of the Lower Cretaceous faunas and their absence may well be incidental. There is no evidence for any insular effects like an impoverishment or great radiation of a few taxa in the Montsec fauna: the weevil diversity is high, with low numbers of specimens per species, and each genus is represented by a single species.

The host-plants of the living members of the family Eccoparthridae are restricted to the conifer family Cupressaceae but the Mesozoic genera perhaps lived on other conifers as well (Gratshev and Zherikhin, 1999). Some modern nemonychids and belids live on angiosperms but the majority of species develops in the male cones of conifers (Araucariaceae and Pinaceae) (Zimmerman, 1994). Thus the most probable hosts of all weevil genera found in Montsec are conifers.

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