

SYSTEMATICS OF THE GENUS *OVIEDINUS* NOV. (COLEOPTERA: PTINIDAE), INCLUDING A FOSSIL NEW SPECIES FROM DOMINICAN AMBER, BIOGEOGRAPHICAL REMARKS AND AN ACCOUNT ON FOSSIL PTINIDS

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ABSTRACT

Systematics of the genus *Oviedinus* nov. (Coleoptera: Ptinidae), including a fossil new species from Dominican amber, biogeographical remarks and an account on fossil Ptinids.

The genus *Oviedinus* **gen. n.** (Coleoptera: Ptinidae) is described from the Caribbean region, including the species *Ptinus semiobscurus* Pic and *Ptinus latus* Pic from Brazil, *Ptinus tesellatus* Gorham from Moustique Island, *Ptinus strangulatus* Fall from Florida, *Ptinus dufawi* Pic from Guadalupe, *Ptinus angustithorax* Bellés from Venezuela, *Ptinus espanyoli* Bellés from Jamaica and the fossil new species *Oviedinus hispaniolensis* from Dominican amber collected at Hispaniola. *Oviedinus* falls in the vicinity of *Gynopterus* Mulsant & Rey, but the peculiar structure of the prothorax of the new genus, with the posterior constriction showing a well delimited smooth groove, distinguishes it from *Gynopterus*, which presents a simple constriction.

Key words: Coleoptera, Ptinidae, systematics, Caribbean biogeography, Dominican amber fossil.

INTRODUCTION

The study of the Neotropical Ptinidae became especially difficult after the work of Maurice Pic who, between 1896 and 1939, published as much as 51 isolated descriptions of new species, the major part of them being assigned to the genus *Ptinus* L., without thoroughly studying the affinities of the new taxa. Therefore, the genus *Ptinus* in the Neotropical region became a sort of «miscellaneous» genus, where a notable disparity of species and species-groups has been included.

In previous papers the author have contributed to clarify the composition of the Neotropical species originally assigned to *Ptinus* by describing two new genera (*Prosternoptinus* Bellés, 1985 and *Tropicoptinus* Bellés, 1999) (BELLÉS, 1985, 1999) and by defining the «*Ptinus semiobscurus* group» of species (BELLÉS, 1986) (see also PHILIPS, 2000). The present paper follows this line with the description of a new genus for the «*Ptinus semiobscurus* group», to embrace eight species from the Caribbean region. Seven of them were described under the genus *Ptinus*, and the remaining one is described as

new in the present paper. The new species is a fossil ptinid from the Dominican amber which, in addition to afford new taxonomic data, helps to clarify the biogeographical history of the new genus.

MATERIAL AND METHODS

The type-specimens of *Ptinus semiobscurus* Pic, *Ptinus latus* Pic and *Ptinus dufaudi* Pic, and a «cotype» of *Ptinus tesellatus* Gorham, were supplied by the Muséum National d'Histoire Naturelle, Paris (MNHN). The type-specimen and a paratype of *Ptinus angustithorax* Bellés were borrowed from the Instituto de Zoología Agrícola, Universidad Central de Venezuela, Maracay, Venezuela (IZAM). The type-specimen and a paratype of *Ptinus espanyoli* Bellés were supplied by the Canadian Museum of Nature, Ottawa, ON (CMNC). A paratype of *Ptinus strangulatus* Fall was borrowed from the United States National Museum, Washington D.C. (USNM); fresh material from *P. strangulatus* was supplied by Stewart B. Peck, Department of Biology, University of Ottawa (ON). The specimen in Dominican amber belonging to a new fossil species described in the present paper was bought by the author in «Amberica» company, Dominican Republic.

SYSTEMATICS

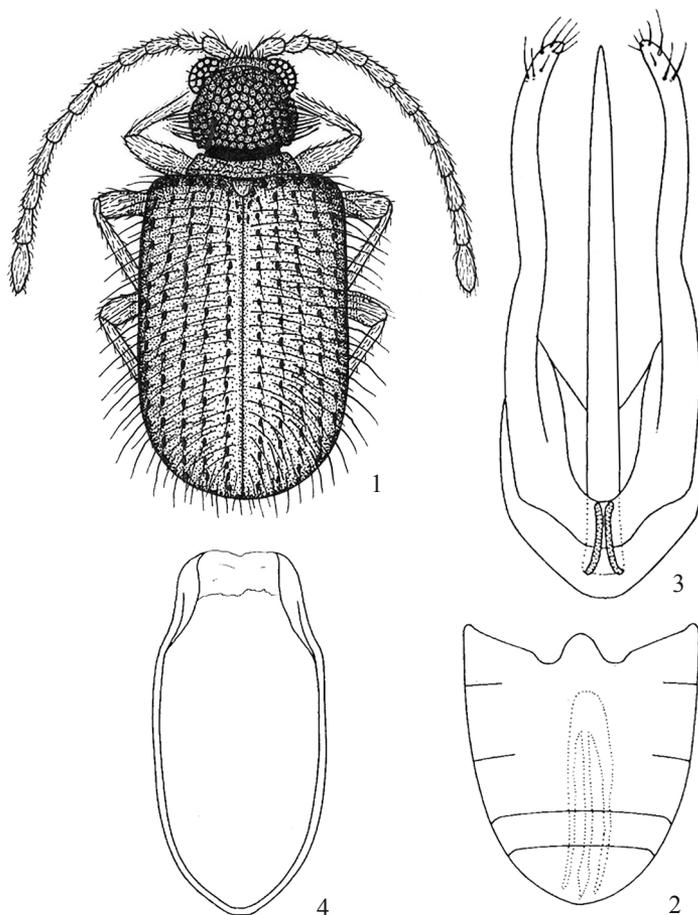
The species considered in the present paper are those included in the «*Ptinus semiobscurus* group», as previously defined (BELLÉS, 1986), to which three other species are now added: *P. strangulatus* Fall, 1905, from Florida peninsula, *P. espanyoli* Bellés, 1997, from Jamaica, and a new fossil species from the Dominican amber. The information presently available suggests the convenience of formally proposing a new genus for the «*Ptinus semiobscurus* group» including the aforementioned three species newly incorporated. This new genus is described as follows.

Genus *Oviedinus* gen. n.

Type species: *Ptinus angustithorax* Bellés, 1986

Description

Length 2-3 mm; body elongate and subparallel in both sexes; color generally brown, varying from reddish to almost black, depending on the species; pubescence consisting of scattered setae, with no patches of scale-like setae neither on the pronotum nor on the elytra (Fig. 1). Head partially visible from above; surface with scattered erect yellow setae; eyes round and more or less convex, projecting laterally, with scattered short and erect setae between ommatidia; interantennal space narrow; antennae 11 segmented, filiform, shorter than the length of the body (Fig. 1). Pronotum with granulations convex and well delimited, with lateral lobes more or less marked, and with the posterior constriction consisting of a well delimited transversal groove wide and smooth; scutellum subtriangular and well apparent (Fig. 1); prosternal process narrow, slightly expanded distally, and extending past posterior margin of procoxae; mesosternal process extending posteriorly 2/3 length of mesocoxae; legs with five segments in all tarsi. Elytra with humeral angles broadly rounded and sides subparallel in both sexes, and with longitudinally aligned rows of small punctures; pubescence composed of two types of setae, one type



Figs 1-4. Habitus (1), aedeagus (3) and male genital segment (4) of *Oviedinus angustithorax* (Bellés); visible ventrites of *O. dufai* (Pic), with indication of the aedeagus position (dotted silhouette) (2).

consisting of a row of erect or suberect setae between punctures, the other type consisting of shorter recumbent setae inserted along each puncture row (Fig. 1). Sternal part of the abdomen with five visible ventrites; first three fused and suture line sometimes obsolete at middle; fourth ventrite reduced in length (Fig. 2). Aedeagus elongate, subsymmetrical, parameres about the same length of median lobe (Fig. 3); male genital segment composed of two branches, slightly expanded in the distal part (Fig. 4). Sexual dimorphism scanty apparent, in comparison with males, females usually have the antennal segments shorter, the eyes smaller and the elytra less slender.

Discussion

Oviedinus can be placed in the vicinity of *Gynopterus* Mulsant & Rey, 1868, with a number of species known in the New World. However, the peculiar structure of the prothorax of *Oviedinus*, with the posterior constriction consisting of a well delimited transversal and smooth groove, is clear enough to separate this genus from *Gynopterus*,

which shows a simple constriction in the posterior 3/4 of the pronotum. Another typical feature of *Oviedinus* is the fusion of the first two sutures of the ventral part of the abdomen, a feature which is shared by the New World genus *Niptinus* Fall, 1905. However, the posterior part of the pronotum of *Niptinus* shows a constriction simple and not very apparent. The structure of the pronotum of *Oviedinus* has some resemblance with that of *Sulcoptinus* Bellés, 1988, from Madagascar and other islands from the Indian Ocean (BELLÉS, 1988, 1991), which also shows a well marked transversal groove in the posterior 3/4 of the pronotum. However, *Oviedinus* differs from *Sulcoptinus* in many characters, for example in the complex and asymmetrical aedeagus showed by the later genus (BELLÉS, 1988, 1991).

Distribution

Northeastern South America (Venezuela and Brazil), Caribbean islands (Greater and Lesser Antilles) and Florida peninsula.

Etymology

Dedicated to Gonzalo Fernández de Oviedo (Madrid, Spain, 1478-Santo Domingo, Hispaniola, 1557), author of the «*Sumario de la natural y general historia de las Indias*» (1526) and «*Historia general y natural de las Indias*» (1535), which contain the first systematic accounts on the natural history of the New World.

CATALOGUE OF SPECIES

***Oviedinus semiobscurus* (Pic, 1896), comb. n.**

Ptinus semiobscurus Pic, 1896

Ptinus semiobscurus Pic. Pic, 1899

Ptinus semiobscurus Pic. Bellés, 1986

This species was described and diagnosed by PIC (1896, 1899), and revised and figured by BELLÉS (1986) including the description of the aedeagus. It is only known from the Serra da Communaty, in Pernambuco (Brazil).

***Oviedinus latus* (Pic, 1896), comb. n.**

Ptinus latus Pic, 1896

Ptinus latus Pic. Pic, 1899

Ptinus latus Pic. Bellés, 1986

Species briefly defined and diagnosed by PIC (1896, 1899), and revised and figured by BELLÉS (1986). It is known only from a single specimen collected at Bahia (Brazil).

***Oviedinus tesellatus* (Gorham, 1898), comb. n.**

Ptinus tesellatus Gorham, 1898

Ptinus tesellatus Gorham. Bellés, 1986

O. tesellatus was briefly described and figured by GORHAM (1898), and revised by BELLÉS (1986). It is endemic from Moustique Island, close to Grenada (Lesser Antilles).

***Oviedinus strangulatus* (Fall, 1905), comb. n.**

Ptinus strangulatus Fall, 1905

Ptinus strangulatus Fall. Papp, 1962

This species was thoroughly described by FALL (1905). Although it presents the

typical features that characterized the «*Ptinus semiobscurus* group» (like the well delimited transversal groove in the posterior part of the prothorax, and the fusion of the first three ventrites), it was overlooked in the synopsis by BELLÉS (1986), which was focused on Antillean and South American fauna. The type specimens are from Miami and Key Largo (Florida, USA). In addition to a paratype from Miami, the author has studied fresh material from a forest in the Deering Estate Park, Dade Co, South Miami, Florida (USA), (1-VI/25-VIII-1986, S. & J. Peck leg.).

***Oviedinus dufai* (Pic, 1906), comb. n.**

Ptinus dufai Pic, 1906

Ptinus dufai Pic. Lepesme, 1947

Ptinus dufai Pic. Bellés, 1986

This species was briefly defined by PIC (1906), and revised and figured by LEPESME (1947) and BELLÉS (1986) who included the description of the aedeagus. It is known from the locality of Trois Rivières, in the Island of Guadalupe (Lesser Antilles).

***Oviedinus angustithorax* (Bellés, 1986), comb. n.**

Ptinus angustithorax Bellés, 1986

O. angustithorax was described, diagnosed and figured by BELLÉS (1986). It is known from Venezuela, from the localities of La Yagua (Cojedes) and Cata (Aragua).

***Oviedinus espanyoli* (Bellés, 1997), comb. n.**

Ptinus espanyoli Bellés, 1997

This species was described, diagnosed and figured by BELLÉS (1997). It is only known from the locality of Duncans, in Jamaica (Greater Antilles).

***Oviedinus hispaniolensis* sp. n.**

Type material. Holotype: a female in amber from the Dominican Republic, in Hispaniola island (Greater Antilles) (X.B. collection).

Description (Fig. 5)

Length 2.1 mm. Color uniformly dark brown. Eyes very convex, semispherical; antennae robust and short, shorter than half the length of the body. Pronotum somewhat longer than wide, with the granulations flat but well apparent; disc very convex, forming a sort of hunch; sides rounded and neatly protuberant; posterior constriction consisting of a narrow, but well marked groove. Elytra long, almost 2 times longer than wide; elytral sides subparallel; punctures narrow and long, densely aligned in rows; setae inserted in each puncture yellow, recumbent and short, only somewhat longer than the length of the puncture; setae inserted between puncture rows yellow, suberect and long, 3 times as long as those inserted in the punctures. First three ventrites fused, with the suture line practically obsolete at middle.

Discussion

The structure of the pronotum with the constriction consisting of a narrow groove and the sides rounded and neatly protuberant, as well as the relatively short antennae, shorter than half the length of the body, relates *O. hispaniolensis* with *O. tesellatus* and *O. dufai*, and neatly distinguishes it from *O. semiobscurus*, *O. strangulatus*, *O. latus*, *O. angustithorax* and *O. espanyoli*, which have the posterior constriction of the pronotum consisting of a large groove, and the antennae longer than 3/4 the length of the body.

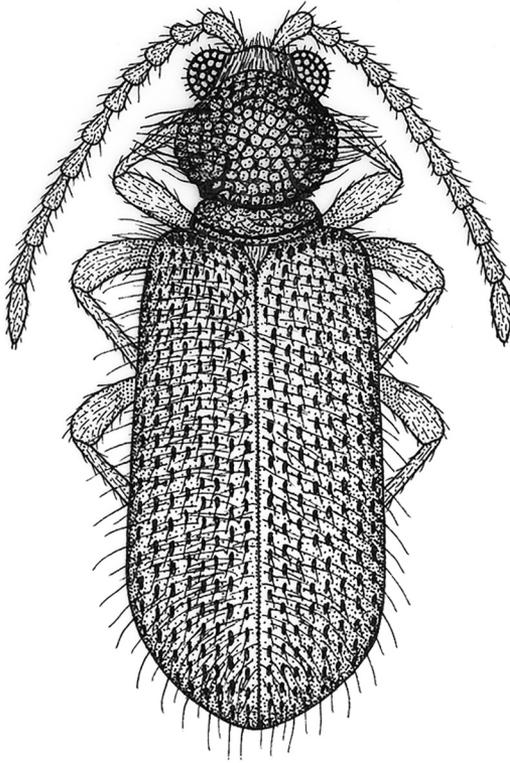


Fig. 5. Habitus of *Ovedinus hispaniolensis* sp. n.

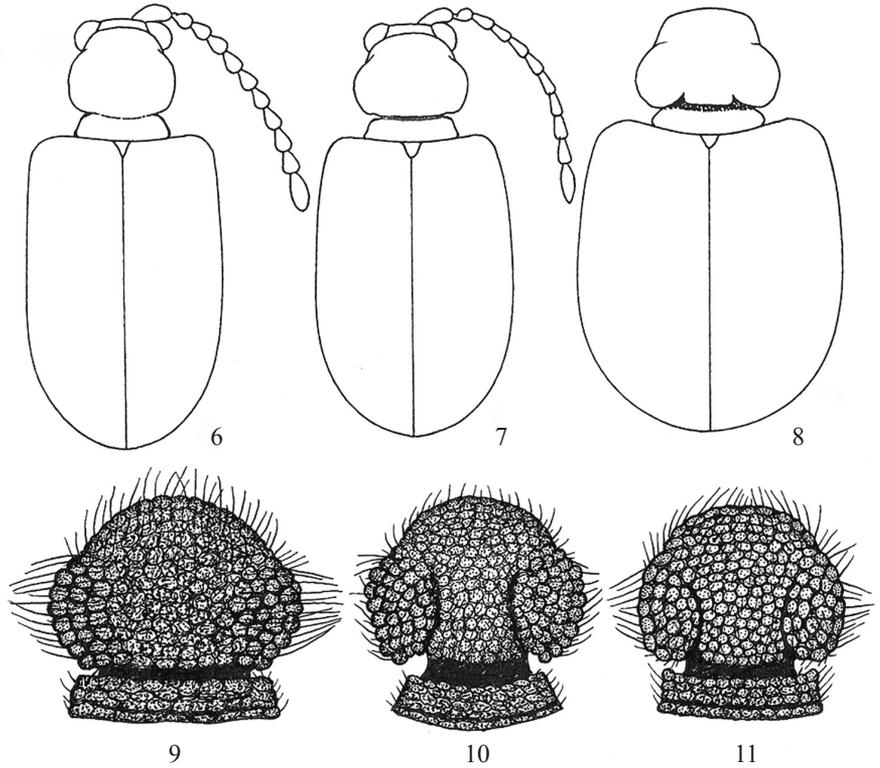
The more protuberant sides of the pronotum and the antennae with almost all segments subcylindrical, distinguishes *O. hispaniolensis* from *O. tesellatus*, which has the sides of the pronotum less protuberant and the antennae with the segments pedunculate. The very narrow groove of the posterior constriction of the pronotum and the morphology of the elytra, with subparallel sides, distinguishes *O. hispaniolensis* from *O. dufauri*, which has the groove of the posterior constriction of the pronotum somewhat larger in the middle, and the elytra with the sides rounded, at least in the female.

Etymology

Name derived from Hispaniola island, where the type was found.

KEY OF SPECIES IDENTIFICATION

- 1 Posterior transversal groove of the pronotum narrow (Figs. 6, 7). Antennae short, shorter than 3/4 the length of the body (Figs. 5-7) 2
- Posterior transversal groove of the pronotum wide (Figs. 1, 9-11). Antennae long, longer than 3/4 the length of the body (Fig. 1) 4



Figs 6-11. Habitus (schematic) of the female of *Oviedinus tesellatus* (Gorham) (6), *O. dufai* (Pic) and *O. latus* (Pic) (8); pronotum of the female of *O. semiobscurus* (Pic) (9), *O. espanyoli* (Bellés) (10) and *O. strangulatus* (Fall) (11).

- 2 Antennae robust, the female with all segments pedunculated. Posterior transversal groove of the pronotum quite superficial at middle. Sides of the pronotum not very prominent, scarcely surpassing the convexity of the eyes (Fig. 6) *O. tesellatus* (Gorham)
- Antennae slender, the female with all segments subcylindrical. Posterior transversal groove of the pronotum deep at middle. Sides of the pronotum quite prominent, clearly surpassing the convexity of the eyes (Figs. 5, 7) 3
- 3 Posterior transversal groove of the pronotum very narrow at middle. Elytra of the female with the sides subparallel (Fig. 5) *O. hispaniolensis* **sp. n.**
- Posterior transversal groove of the pronotum relatively wide at middle. Elytra of the female with the sides rounded (Fig. 7)..... *O. dufai* (Pic)
- 4 Elytra short (1.5 times longer than wide) and oval. Pronotum with a discal protuberance quite convex, which partially conceal the posterior transversal groove (Fig. 8). *O. latus* (Pic)
- Elytra long (more than 1.5 times longer than wide) and subparallel (Fig. 1). Prono-

- tum with a discal protuberance less convex, not concealing the posterior transversal groove (Figs. 9-11)..... 5
- 5 Color reddish brown. Eyes of the female very convex, semispherical. Pronotum transverse, with the surface covered with granulations of big size, and with the posterior transversal groove not very deep (Fig. 9)..... *O. semiobscurus* (Pic)
- Color dark brown. Eyes of the female not very convex, in dorsal view slightly surpassing the curvature of the head. Pronotum longer than wide, with the surface covered with granulations of smaller size, and with the posterior transversal groove deeply excavated (Figs. 1, 10-11)..... 6
- 6 Pronotum with the sides very prominent, like lateral hunches, and with the posterior transversal groove very large (Fig. 10)..... *O. espanyoli* (Bellés)
- Pronotum not forming lateral hunches, and with the posterior transversal groove narrower (Figs. 1, 11)..... 7
- 7 Sides of the pronotum regularly rounded and with a pubescence formed by long and convergent setae; granulations of the disc not well delimited (Fig. 1). Setae inserted between the elytral puncture rows long, approximately 3 times longer than the space between the puncture rows (Fig. 1)..... *O. angustithorax* (Bellés)
- Sides of the pronotum enlarged towards the posterior transversal groove and with a pubescence formed by shorter and scattered setae; granulations of the disc well delimited (Fig. 11). Setae inserted between the elytral puncture rows shorter, approximately 2 times longer than the space between the puncture rows *O. strangulatus* (Fall)

BIOGEOGRAPHICAL REMARKS

Our data indicates that the distribution of the genus *Oviedinus* comprises the Caribbean Islands and adjacent continental land, Venezuela and Brazil in South America, and Florida peninsula in North America. However, the genus must probably be more spread in the area (data are lacking from many Antillean islands and from Central America, for example).

The paucity of data, especially the lack of information on the possible presence of *Oviedinus* in critical regions, like Mexico and the Central America region, for example, makes premature a thorough phylogenetical analysis. However, the distribution presently known, including the fossil species from Dominican amber (which affords singularly precise colonization data) and the paleogeography of the Caribbean region, allow to propose at least preliminary hypotheses about the biogeographical history of the new genus.

The plate tectonics and the paleogeography of the Caribbean area is far from simple, as suggested by the discrepant theories of different contributions addressed to reconstruct it, like the classical papers of ROSEN (1975, 1985), who combine geological and biological data; the classical reviews of STEHLI & WEBB (1985) and DONNELLY (1988); and the more recent syntheses of ITURRALDE-VINENT & MACPHEE (1999), MESCHÉDE & FRISCH (2001) and RAO (2008). Very briefly, it seems that from the Jurassic to the end of the Tertiary, the two Americas were separated, although there are evidences that suggest that there were arcs of islands from volcanic origin that connected the two subcontinents around the end of the Cretaceous and the Paleogene. From the Miocene onwards, the link of both Americas became progressively continuous and culminated with the definitive consolidation of the Isthmus of Panama around the Pliocene.

Concerning the Greater Antilles, they apparently originated from a Cretaceous inter-American volcanic arc, which would have fragmented and derived towards the northwest, and neared their present location around the Miocene.

According to the known distribution and relationships of *Oviedinus* species, the most parsimonious hypothesis is that the genus originated in Northern South America, where the greatest specific diversity is presently found, including the very peculiar species *O. latus*, with unusual wide and convex elytra and pronotum, species with wide pronotal groove and long antennae, like *O. angustithorax*, and species with narrow pronotal groove and short antennae, like *O. dufau*, in the island of Guadalupe, close to Venezuela. Thereafter, the *Oviedinus* ancestors would have spread in the Caribbean insular dominion by stepping stone progressive colonization of the different islands. Considering that Dominican amber was formed during the late Early Miocene through early Middle Miocene (ITURRALDE-VINENT & MACPHEE, 1996), the fossil *O. hispaniolensis* tells us that *Oviedinus* ancestors had colonized Hispaniola 15 to 20 million years ago. Jamaica was largely submerged in early mid-Tertiary and only became partially emergent, and thus available for terrestrial colonization, in the early Miocene, nearly 20 million years ago (DONNELLY, 1988; PECK, 1998). Therefore, the ancestors of *O. espanyoli* should have reached Jamaica after this date, possibly from adjacent Great Antilles islands. The case of *O. strangulatus* raises the question of whether the ancestors of it reached Florida by land, through the Isthmus of Panama from the Pliocene, or from adjacent Caribbean islands following the stepping stone process initiated in Northern South America. Unfortunately, there is no data of *Oviedinus* from Mexico and other areas of Central and North America that would help to illuminate this issue. However, the close morphological similarity of *O. strangulatus* with the species of Venezuela and adjacent islands, notably with *O. angustithorax*, suggests that the first hypothesis, considering a terrestrial dispersion through the Panama isthmus consolidated in the Pliocene, some 3 million years ago, is more plausible. The alternative hypothesis contemplating the colonization of Florida from Cuba or Hispaniola from the Miocene, some 20 million years ago, in the context of the general stepping stone process of colonization of the Caribbean, would have probably led to a greater divergence of *O. strangulatus* with respect to the Venezuelan species, and to closer resemblances with the Greater Antilles species, which is not the case.

FOSSIL PTINIDS

The discovery of *O. hispaniolensis* is interesting from a paleontological point of view because fossil ptinids are rare, even in amber inclusions. For example, in Baltic amber, which has been thoroughly studied (LARSSON, 1978; POINAR, 1992; POINAR & POINAR, 1999), beetles belonging to Ptinidae are comparatively rare, representing only 0.4 % of the total beetles recorded in museums (HIEKE & PIETRZENIUK, 1984). This is not surprising because ptinids are mainly scavengers and there are few forest species, and even less truly xylophagous. The only recorded exception is *Ptinus (Pseudoptinus) lichenum* Marsham, 1802, which is able to bore extensive galleries in *Juniperus* trees (BELLÉS, 1980). Until now, only three ptinid species had been previously described from amber: *Sucinoptinus sucini* Bellés & Vitali (2007) and *Ptinus (Gynopterius) inclusus* Bellés & Vitali (2007), from Baltic provenance, and *Electrognostus intermedius* Philips and Mynhardt (2011), from Dominican amber. The oldest citation of fossil ptinids corresponds to Berendt (1845), who mentioned *Ptinus* sp. from Baltic amber (see LARSSON, 1978). Larsson (1978) also mentions that the classical entomologist Edmond Reitter had seen 3 *Niptus* sp. and 16 *Ptinus* sp. in the Klebs collection of the Baltic amber of eastern Prussia.

Thereafter, most of the references refer to Baltic amber and identify the beetle simply at Ptinidae family level (BACHOFEN-ECHT, 1949; HANDLIRSCH, 1906-08; HELM, 1886, 1896; KATINAS, 1971; KLEBS, 1889; LARSSON, 1965, 1978; MENGE, 1856; POINAR, 1992; SPAHR, 1981; WILLIAMSON, 1932). In other cases it is mentioned the genus *Ptinus*, without further specific identification (ABDULLAH & ABDULLAH, 1967; BACHOFEN-ECHT, 1949; BERENDT, 1845; GIEBEL, 1852, 1856a, 1856b; HANDLIRSCH, 1906-08; KLEBS, 1910; LARSSON, 1978; SCUDDER, 1885, 1886, 1891; SPAHR, 1981; POINAR, 1992). Finally, other ptinid samples have been identified as belonging to the genus *Niptus* (ABDULLAH & ABDULLAH, 1967; BACHOFEN-ECHT, 1949; KLEBS, 1910; LARSSON, 1978; SPAHR, 1981; POINAR, 1992). Concerning to Dominican amber, there are few published records of ptinids. The first reference to the family corresponds to POINAR (1992), without going farther in the taxonomic identification, and the family Ptinidae is mentioned again in POINAR & POINAR (1999).

Concerning conventional stone fossils, MADDY *et al.* (1994) and FIELD *et al.* (2000) have reported unclassified *Ptinus* sp. from Middle Pleistocene deposits in England and France, respectively, although the taxonomic status of these «*Ptinus*» is uncertain, given the ambiguity of the fossil remains. A peculiar case has been reported by SPILMAN (1976), who described a new species, *Ptinus priminidi* Spilman, 1976 as a subfossil ptinid from Late Pleistocene rat nests found in middle and late Wisconsin middens from the Whipple Mountains of California, and the Artillery and Kofa Mountains of Arizona (SPILMAN, 1976). This species has been also found in a late Holocene (1910 yr B.P.) desert scrub midden from the Puerto Blanco Mountains (HALL *et al.*, 1988). Similarly ancient «fossil» *Ptinus* have been identified from fossil packrat middens from Sonoran Desert, Mexico (HALL *et al.*, 1988). *P. priminidi* challenges the concept of fossil, as discussed by its author (SPILMAN, 1976), while raises the possibility that it is a still existing species.

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REFERENCES

- ABDULLAH, M. & ABDULLAH, A. 1967. *Crichtonia macleani*, a new genus and species of the Hedobiini Coleoptera: Anobiidae from the Baltic amber. *Entomological News*, 781: 23-27.
- BACHOFEN-ECHT, A. 1949. Der Bernstein und seine Einschlüsse. *Zentralblatt Geol. Paläontol.*, 188 p.
- BELLÉS, X. 1985. Contribution à la connaissance des Ptinidae neotropicales: le genre *Prosternoptinus* nov. (Coleoptera). *Entomologische Blätter*, 81 (3): 132-142.
- BELLÉS, X. 1986. Descripción de *Ptinus angustithorax* n.sp. de Venezuela y definición del «grupo *semiobscurus*» de la Región Neotropical (Coleoptera Ptinidae). *Eos*, 62: 23-29.
- BELLÉS, X. 1988. El género *Sulcoptinus* nov. del dominio insular del océano Índico occidental (Coleoptera, Ptinidae). *Elytron*, 2: 121-126.
- BELLÉS, X. 1991. *Faune de Madagascar: Insectes Coléoptères Ptinidae*. Muséum national d'Histoire naturelle, Paris, 122 p.

- BELLÉS, X. 1997. Descripció de *Ptinus espanyoli* n. sp. (Coleoptera, Ptinidae) de Jamaica. *Bolletí de la Societat d'Història Natural de les Balears*, 40: 109-111.
- BELLÉS, X. 1998. El género *Tropicoptinus* nov. (Coleoptera: Ptinidae) de la región neotropical. *Elytron*, 12: 85-96.
- BELLÉS, X. & VITALI, F. 2007. New fossil spider beetles from Baltic amber (Coleoptera Ptinidae). *Entomapeiron (P. S.)* 2 (2): 17-28.
- BERENDT, G. C. 1845. Die organischen Bernstein-Einschlüsse im Allgemeinen. In: *Der Bernstein und die in ihm befindlichen Pflanzenreste der Vorwelt* (H. R. GOEPPERT, H.R. & G. C. BERENDT, eds.). In: *Die im Bernstein befindlichen organischen Reste der Vorwelt* (G. C. BERENDT, ed.), 1: 41-60. Berlin. Neues Jahrbuch für Mineralogie, Geognosie, Geologie und Petrefaktenkunde, 1845/7: 864-879.
- DONNELLY, T. W. 1988. Geologic constraints on Caribbean biogeography. In: *Zoogeography of Caribbean Insects* (J. K. Liebheer, ed.), p. 15-37. Cornell University Press, Ithaca, New York.
- FALL, H. C. 1905. Revision of the Ptinidae of boreal America. *Trans. Amer. Ent. Soc.*, 31: 97-296.
- GIEBEL, C. G. 1852. *Deutschlands Petrefacten. Ein systematisches Verzeichnis aller in Deutschland und den angrenzenden Ländern vorkommenden Petrefacten nebst Angabe der Synonymen und Fundorte*. Leipzig, XIII + 706 p.
- GIEBEL, C. G. 1856a. Die Insecten und Spinnen der Vorwelt mit steter Berücksichtigung der lebenden Insecten und Spinnen. In: *Fauna der Vorwelt mit steter Berücksichtigung der lebenden Thiere*, 2. Leipzig, XVIII + 511.
- GIEBEL, C. G. 1856b. Geologische Übersicht der vorweltlichen Insecten. *Zeitschrift für die gesammten Naturwissenschaften*, 8: 174-188.
- GORHAM, H. S. 1898. On the Serricorn Coleoptera of St. Vincent, Grenada, and the Grenadines (Malacodermata, Ptinidae, Bostrychidae), with description of new species. *Proceeding of the Zoological Society of London*, 27 (8): 315-343.
- HALL, W. E., VAN DEVENDER, T. R. & OLSON, C. A. 1988. Late quaternary arthropod remains from Sonoran Desert packrat middens, southwestern Arizona and northwestern Sonora. *Quaternary Research*, 29 (3): 277-293.
- HANDLIRSCH, A. 1906-08. Die fossilen Insekten und die Phylogenie der rezenten Formen. Leipzig, IX + VI + 1430 p., 14 Abb., 7 Stammbäume im Text, 3 auf besonderen Tafeln, & Tafelbd.: XL p., 51 Taf.
- HELM, O. 1886. Mitteilungen über Bernstein. XIII. Über die Insecten des Bernsteins. *Schriften der naturforschenden Gesellschaft in Danzig*, N.F., 63: 267-277.
- HELM, O. 1896. Beiträge zur Kenntnis der Insecten des Bernsteins. *Schriften der naturforschenden Gesellschaft in Danzig*, N.F., 91: 220-231.
- ITURRALDE-VINENT, M. A. & MACPHEE, R. D. E. 1996. Age and Paleogeographical origin of Dominican amber. *Science*, 273: 1850-1852.
- ITURRALDE-VINENT, M. A. & MACPHEE, R. D. E. 1999. Paleogeography of the Caribbean region: implications for Cenozoic biogeography. *Bulletin of the American Museum of Natural History*, 238: 1-95.
- KATINAS, V. 1971. Amber and amber-bearing deposits of the southern Baltic area. *Transactions*, 20: 1-151.
- KLEBS, R. 1889. *Aufstellung und Katalog des Bernstein-Museums von Stantien & Becker, Königsberg i. Pr. Nebst einer kuzen Geschichte des Bernsteins*. Königsberg, 103 p.
- KLEBS, R. 1910. Über Bernsteineinschlüsse im allgemeinen und die Coleopteren meiner Bernstein-sammlung. *Schriften der physikalisch-ökonomischen Gesellschaft zu Königsberg*, 51: 217-242.
- LARSSON, S. G. 1965. Reflections on the Baltic amber inclusions. *Entomologische Meddelelser*, 34 (1965-1966/2): 135-142.
- LARSSON, S. G. 1978. Baltic amber - a palaeobiological study. *Entomograph*, 1: 1-192.
- LEPESME, P. 1947. Bostrychoidea. In: *Coléoptères des Antilles* (E. Fletiaux, C. Legros, P. Lepesme & R. Paulian, eds.), p. 194-233. Faune de l'Empire Français 7. Office de la Recherche Scientifique Coloniale, Paris.
- MENGE, A. 1856. Lebenszeichen vorweltlicher, im Bernstein eingeschlossener Thiere. *Programm der Petrischule Danzig*, 1856: 1-32.
- MESCHEDE, M. & FRISCH, W. 2001. The evolution of the Caribbean plate and its relation to global plate motion vectors: Geometric constraints for an inter-American origin. In: *Caribbean Geology into the Third Millennium* (T. A. Jackson, ed.), p. 1-14. Transactions of the Fifteenth Geological Caribbean Conference, 2000. University Press of West Indies, Kingston, Jamaica.
- MULSANT, E., REY, C. 1868. *Histoire Naturelle des Coléoptères de France. Gibbicolles*. Deyrolle, Paris, 226 p.
- PAPP, C. S. 1962. An illustrated and descriptive catalogue of the Ptinidae of North Amerika. *Deutsche Entomologische Zeitschrift*, 5: 367-423.
- PECK, S. B. 1998. Historical biogeography of Jamaica: evidence from cave invertebrates. *Canadian Journal of Zoology*, 77: 368-380.

- PHILIPS, T. K. 2000. Phylogenetic analysis of the New World Ptininae (Coleoptera: Bostrichoidea). *Systematic Entomology*, 25 : 235-262.
- PHILIPS, T. K., MYNHARDT, G. 2011. Description of *Electrognostus intermedius*, the first spider beetle from Dominican amber with implications on spider beetle phylogeny (Coleoptera Ptinidae). *Entomapeiron (P. S.)*, 4 (2): 37-51.
- PIC, M. 1896. Descriptions de Ptinides exotiques. *Miscellanea Entomologica*, 4 : 45-47.
- PIC, M. 1899. Essai d'une étude sur les *Ptinus* du Brésil. *Annales de la Société entomologique Belga*, 43: 31-35.
- POINAR, G. O. 1992. *Life in amber*. Stanford University Press, Stanford. 118 p.
- POINAR, G. O. & POINAR, R. 1999. *The amber forest*. Princeton University Press, Princeton. 239 p.
- RAO, T. R. 2008. Geological evolution of the Caribbean plate: Some critical aspects in the two divergent models. *Current Science*, 95: 736-742.
- ROSEN, D. R. 1975. A vicariance model of Caribbean biogeography. *Systematic Zoology*, 24 (4): 431-464.
- ROSEN, D. R. 1985. Geological hierarchies and biogeographical congruence in the Caribbean. *Annals of the Missouri Botanical Garden*, 72: 636-659.
- SCUDDER, S. H. 1885. Insecta. Insekten. In: *Handbuch der Palaeontologie* (K. A. ZITTEL, ed.) I. 2: 747-831.
- SCUDDER, S. H. 1886. Systematic review of our present knowledge of fossil insects, including Myriapods and Arachnids. *Bulletin of the United States geological Survey*, 31: 1-128.
- SCUDDER, S. H. 1891. Index to the known fossil insects of the world including Myriapods and Arachnids. *Bulletin of the United States geological Survey*, 71: 1-744.
- SPAHR, U. 1981. Systematischer Katalog der Bernstein- und Kopal- Käfer Coleoptera. *Stuttgarter Beiträge für Naturkunde Serie B*, 80: 1-107.
- STEHLI, F. G. & WEBB, S. D. (eds.). 1985. *The Great American Biotic Interchange*. Plenum Press, New York, 530 p.
- WILLIAMSON, G. C. 1932. *The book of amber*. Ernest Benn, London. 268 p.

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