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Anochetus corayi n. sp., the First Fossil Odontomachiti Ant

(Amber Collection Stuttgart: Hymenoptera, Formicidae.
II: Odontomachiti)

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With 4 Figures

Summary

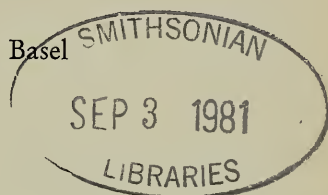
Anochetus corayi n. sp. is described from Dominican amber (Oligocene to Lower Miocene) on the strength of a single winged female which represents the first record of fossil Odontomachiti. The new species belongs to the *A. mayri* species group still living in the Caribbean area and shows a discrete set of presumably apomorphic characters. The few plesiomorphous characters recognizable are mainly correlated with the hypogaic behaviour.

Zusammenfassung

Als erster Fossilfund aus der Ameisen-Subtribus Odontomachiti wird ein geflügeltes Weibchen von *Anochetus corayi* n. sp. aus dem Dominikanischen Bernstein (Oligocän bis Unter-Miocän) beschrieben. Diese Art gehört zur *A. mayri*-Artengruppe, die auch heute noch in der Karibik vertreten ist. Sie zeigt einige vermutlich apomorphe Merkmale; die wenigen erkennbaren plesiomorphen Merkmale sind hauptsächlich mit der hypogaeischen Lebensweise korreliert.

1. Introduction

Following on with the study of the rich Dominican amber collection of the State Museum of Natural History, Stuttgart, I describe here a single winged *Anochetus* female. The genus *Anochetus* having been recently reviewed (Brown, 1978), a comparison between the fossil and the recent species has been made easier and has given more concrete results.



2. Material and Methods

One single *Anochetus* specimen has been found within the rich amber collection examined. It is embedded into a small amber piece of very clear colour and without other detectable inclusions. All abbreviations and measurements used for the description follow the work of BROWN (1978) to which reference should be made.

3. Description

Anochetus corayi n. sp.

Holotype: Winged female (the sole specimen known) in Dominican amber, preserved in the amber collection of the State Museum of Natural History, Stuttgart (Department of Phylogenetic Research), No. Do-834-K-1.

Derivatio nominis: The species is named after Mr. Armin Coray who so skilfully prepared the illustrations of this and many other amber specimens.

Diagnosis: Female. A small *Anochetus* of the *mayri* group with smooth integument, thick mandibles, anteroposteriorly compressed and superiorly incised scale, and very reduced propodeal spines.

Measurements (in mm) and indices: TL 3.4, HL 0.60, HW 0.76, ML 0.40, WL 1.04, scape L 0.64, eye L 0.16, CI 126.67, MI 66.67.

Body short and slender. Head much narrower behind than across eyes (HW across eyes 0.44 mm). Eyes large and posteriorly compressed, with about 15 ommatidia across greatest diameter. Antennal scapes surpassing the posterior border of the „occipital“ lobes by about once their maximum diameter. Funiculi 11-jointed with the first joint longer than II+III and broader. Apical antennal segment tapered to a very slender acuminate point.

Mandibles comparatively short and very thick, strongly convex on the sides and gradually broadened apicad, shining, sparsely punctate and feebly pubescent; interior margins nearly straight with a deep excision before the apex; teeth elongate and pointed; apical teeth slightly shorter than ventral; intercalar nearest to ventral than to apical and shorter than either.

Antennal fossae broad with a discernible posterior margin which is in front of cephalic midline. Frons slightly depressed in the middle with the ocelli at the border of the depression. „Occipital“ lobes relatively narrow and not very pronounced posteriad, with slightly concave sides.

Head capsule essentially smooth and shining with a finely longitudinally striate frons; the striae extending up behind the ocular prominences and replaced on the vertex by a very smooth punctuation. A few inconspicuous longitudinal striae on the sides behind the eyes. Cephalic capsule essentially hairless, besides a sparse, minute, subdecumbent pubescence, very difficult to detect and covering nearly all the surface. A similar pubescence is distributed irregularly on the thorax proper and on the legs. A few long standing hairs on the inferior surface.

Trunk slender, nearly flat dorsally and with subparallel sides; maximum width at pronotum's maximum height; mesonotal disc about $\frac{1}{2}$ broader than long; scutellum narrow and about $\frac{1}{3}$ longer than broad; propodeum broader than the dorsal discs, bearing two small, obtuse teeth, separated by a wide excision; propodeal dorsum subequal in length to declivity and forming with it an angle of about 120° . Dorsolateral area of the pronotum and sides of the scutel-

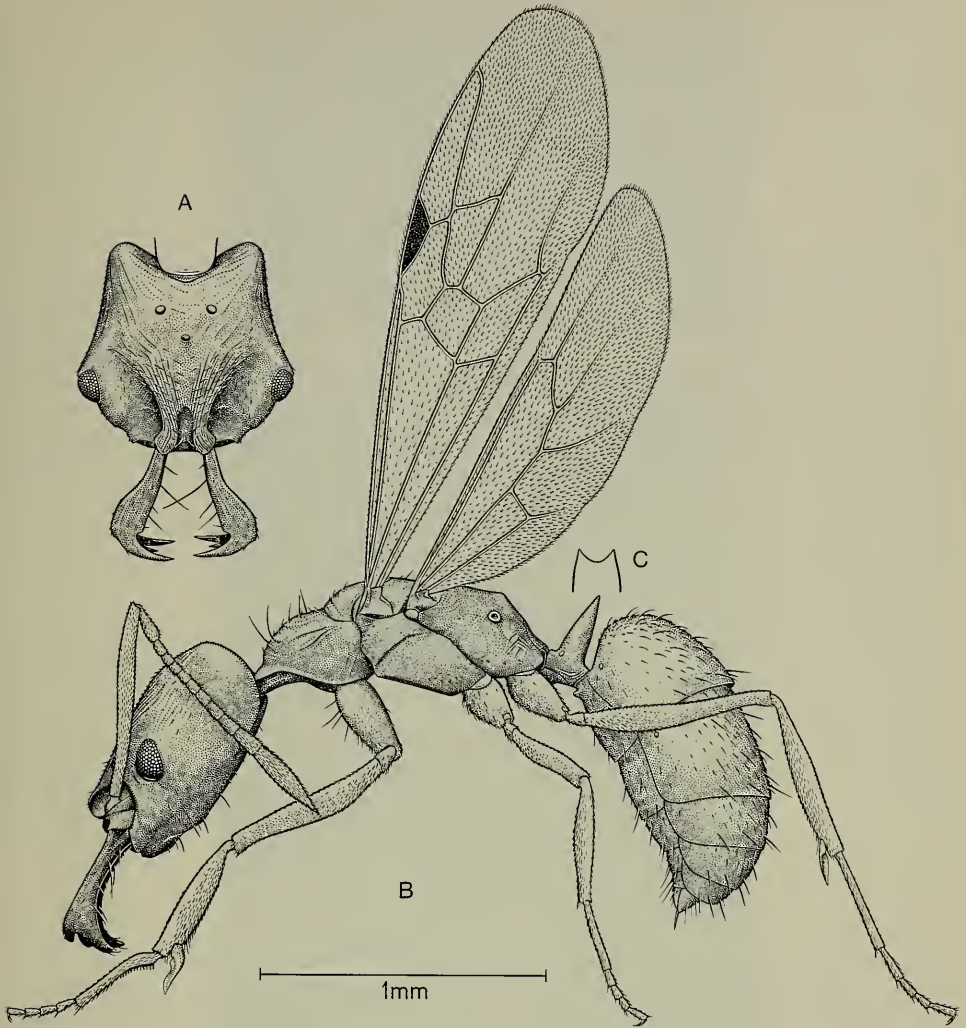
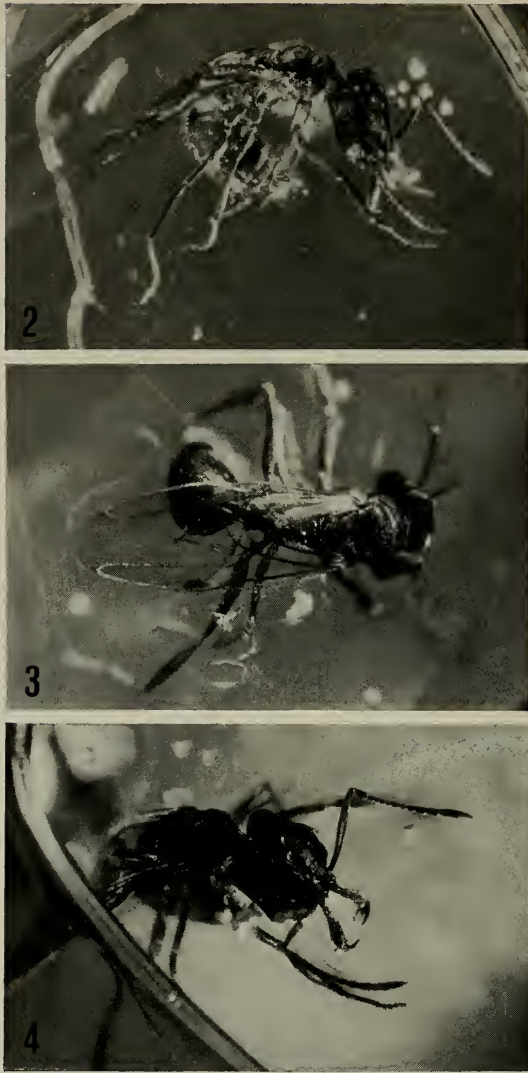


Fig. 1. *Anochetus corayi* n. sp., holotype female. — A: Head in dorsal view. — B: Full profile of the body and appendages. — C: Schematic outline of the scale in frontal view. — Drawings provided by ARMIN CORAY. The wings, lying closely along the back in the fossil specimen, have been spread out in the drawing for better demonstration of the veins.

lum sparsely covered with smooth longitudinal striae; rest of the integument smooth and shining. A few relatively long standing hairs on the trunk dorsum; similar hairs but shorter on the fore coxae; rest of the integument glabrous or with inconspicuous, sparse, adpressed pubescence.

Fore wings approaching the primitive ponerine pattern, without any trace of 1r and a well developed Mfr; R1 indistinguishable; Rsf5 reaching the wing border; Mf4 and Cu-A1 short and obsolete before reaching the alar margin. Hind wings without a visible anal lobe.



Figs. 2—4. *Anochetus corayi* n. sp., holotype. — Fig. 2. Habitus, oblique lateral view. — Fig. 3. Habitus, dorsal view. — Fig. 4. Head and alitrunk in dorsolateral view. — Photomicrographs provided by Dr. D. SCHLEE.

Petiole squamiform, strongly anteroventrally compressed, with a sharp apical rim; in frontal view the rim is feebly convex on the sides and broadly and deeply excised on the dorsum. Gaster broad with an inconspicuous constriction between the first and the second somite; first and second gastric somites subequal in length; sting slightly extended. Petiole glabrous and shining; gaster equally shining but with sparse minute pubescence and longer, acuminate subdecumbent hairs over its whole surface except the anterior face.

Legs long and slender; a single inconspicuous spiniform spur on the mesotibial apex and one larger pectinate spur coupled with a small spiniform one on the hind tibial apex.

Colour irregularly chestnut to brown with somewhat lighter coxae and gaster. Wings uniformly brownish with dark veins and pterostigma.

4. Relationships

For its small size, squamiform excised petiole and general appearance, *A. corayi* clearly belongs to the group of *A. mayri* EMERY, the most widespread in the Caribbean area. *A. mayri*, moreover, is one of the three Recent *Anochetus* species known to live on the island of Hispaniola (the other species being *haytianus* WHEELER & MANN and *longispina* WHEELER, which belong to an entirely different species group). Trying to identify *A. corayi* through the key prepared by BROWN (1978), one also reaches *mayri*, but a comparison between the *corayi* holotype and one *mayri* female from Cuba (Pinar del Rio, Sierra del Organo, Rangel, 9. II. 1930, A. BIERIG leg., NHMB) reveals sure differences. *Mayri* has longer antennal scapes and funicular joints, longer and slender mandibles with traces of at least two denticles on the internal margins (nearly straight in *corayi*), a stouter alitrunk with more pronounced propodeal spines, and the propodeal dorsum making with the declivity an angle of about 150° (120° in *corayi*). But the two most visible differences are probably to be seen in the petiolar outline (superiorly much more incised in *mayri* and with much more pronounced spines) and in the sculpturation which is often punctate or at least punctat rugose in *mayri*, particularly on the propodeum, while *corayi* is only superficially striate with a smooth propodeum.

5. Discussion

Systematics. — The genus *Anochetus* has been recently regarded as a member of the large tribe Ponerini where, together with *Odontomachus*, it constitutes the subtribe Odontomachiti. Several fossil Ponerini are known, but until now we had no fossil record for the Odontomachiti. This subtribe represents a very homogeneous natural group recognizable at first sight for the peculiar head shape and for the form and position of the mandibles in the worker and female castes. In fact, in the classical myrmecological literature, the two genera *Anochetus* and *Odontomachus* represent a separate tribe: Odontomachini which BROWN in his revision (1978) regards only as a subtribe of Ponerini, postponing the explanation of this change to a future paper not yet published. Here the change has been accepted bona fide and for uniformity with the recent revision, but, of course, the two genera *Anochetus* and *Odontomachus* represent a highly characteristic and surely monophyletic natural group the meaning of which will be little affected by regarding it as a tribe or as a subtribe.

Biology. — Members of this subtribe usually live in small colonies (particularly the small size *Anochetus*) and their nesting and foraging behaviours are often confined to the litter or to the ground. This may explain at least in part the absence of fossil records for the whole group in the literature. Not with-

standing that and the peculiar morphology which could also indicate a hypogaecic adaptation, a few species are clearly arboreal or live in the epiphytic „ant gardens“ in the Neotropical region. One Indomalayan species (*O. malignus* SMITH: Borneo to Solomon Islands) is strictly confined to the coral reefs sometimes submerged by the tides.

The *A. corayi* winged female has been obviously embedded in resin at the time of her nuptial flight. The *Odontomachiti* now live in the whole tropical and subtropical regions of the world with *Anochetus* penetrating a little more deeper into temperate areas. This genus now comprises 82 described species ranging from northern Argentina, southwestern Australia and the Cape Province to south Spain, Tunisia, Kurdistan, and the Himalayas.

E v o l u t i o n. — BROWN (l. c.) recognizes some evolutionary trends among the Recent species and I think it interesting, by following his reasoning, to try to ascertain here the presence and frequency of plesiomorphous characters in *A. corayi*. Only the following four characters are recognizable as probably in a plesiomorphous state: 1. dark integument; 2. slender antennal segments; 3. slender legs; 4. presence of erect hairs.

It is clear that all these characters have an adaptive meaning and their value within a phylogenetic context is greatly reduced.

On the other hand, the following five characters of *A. corayi* are in an apomorphic state according to the views of Brown: 1. reduced body size; 2. mandibles shortened; 3. mandibles apically thickened; 4. sculpture smooth; 5. petiole node squamiform.

If this analysis is correct and the sample of characters representative, one should conclude that the hypogaecic behaviour is a secondary adaptation in *Anochetus*, while the peculiar cephalic and mandibular morphology is a primitive condition originated before or independently from the appearance of the hypogaecic behaviour.

It has been already said that *A. corayi* belongs to the group of *A. mayri* and is very similar to it. In fact on the morphology alone it could well be a Recent new species (which, of course, would never be described from a single female); but in the case of the first fossil record, we must do it. The new fossil provides additional evidence that in ant evolutionary history the major phylogenetic events took place before the available fossil records.

Moreover according to the amber datings reported by BARONI URBANI (1980) it is now clear that neither the morphology nor the geographic pattern of the *A. mayri* group in the Caribbean area suffered significant changes in the last 15 millions of years at least.

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