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Ants of Colombia X. *Acanthognathus* with the description of a new species (Hymenoptera: Formicidae)

Hormigas de Colombia X. *Acanthognathus* con la descripción de una nueva especie

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Abstract: A new species in the ant genus *Acanthognathus, A. laevigatus* n. sp., is described from the Pacific region of Colombia (Barbacoas, Nariño). A key to identify the eight species of *Acanthognathus* known to occur in the Neotropics is provided. In addition, the species *A. brevicornis* is recorded for the first time for Colombia.

Key words: *Acanthognathus laevigatus* n. sp. Dacetini. Neotropics. Taxonomy.

Resumen: Se describe una nueva especie del género de hormigas *Acanthognathus, A. laevigatus* n. sp. de la región Pacífica de Colombia (Barbacoas, Nariño). Se provee una clave para identificar las ocho especies conocidas de *Acanthognathus* que se encuentran en el Neotrópico. Además, la especie *A. brevicornis* se registra por primera vez para Colombia.

Palabras clave: *Acanthognathus laevigatus* n. sp. Dacetini. Neotrópico. Taxonomía.

Introduction

The ant genus *Acanthognathus* Mayr, 1887 belongs to the tribe Dacetini (Formicidae: Myrmicinae), and includes six extant and a fossil species from Dominican Amber (Baroni-Urbani & de Andrade 1994; Bolton 2000; Bolton *et al.* 2006) distributed exclusively in the Neotropical region from Honduras to northeastern Argentina and southeast Brazil (Brown & Kempf 1969; Baroni Urbani & De Andrade 1994; Bolton 2000).

In accordance with Brown and Kempf (1969), members of *Acanthognathus* species nest in rotten twigs or small pieces of rotting wood in forest litter. The colonies are usually monogynous and small, often with only 10-20 or fewer adult workers, and no nest with more than about 30 workers have been seen. Workers capture, by means of a snap of the mandibles, and feed entomobryid Collembola.

Dietz and Brandão (1993) observed that workers of *A. rudis* accepted as prey some tenebrionid larvae (*Palembus* sp.) and entomobryid Collembola but rejected termite workers and larvae of *Tenebrio* sp. Their paper and, more precisely, Gronenberg *et al.* (1998) described the hunting behaviour of *A. rudis*: The worker approaches towards a prey slowly with its mandible open. Its mandible closer muscle is subdivided into two distinct parts: as in a catapult, a large slow closer muscle contracts in advance and provides the power for the strike while the mandibles are locked open. When the prey touches specialized trigger hairs, a small fast closer muscle rapidly unlocks the mandibles and thus releases the strike, closing this in less than 2,5 milliseconds and catching the prey. This action can be accompanied by stinging prey at least once until this is immobilized.

Acanthognathus was established by Mayr (1887) from a single worker taken in southestern Brazil. Mann (1922) described a second species (*A. lentus*) from Central America. M. R. Smith (1944) reviewed this genus and included a new species (*A. brevicornis*) from Panama, being recorded later by Kempf (1964) for the first time in Brazil. Afterwards, Brown and Kempf (1969) revised the genus and described three new species: *A. rudis*, from southestern Brazil; *A. stipulosus*, from heart of Amazonia and *A. teledectus*, from the Pacific Slope of Colombia. They described also, for first time, a male of the genus and discussed about how *A. lentus* could be a local sculptural variant of *A. ocellatus*. But later Kempf (1975) recorded this species for the first time in Brazil and confirmed it as a valid species. Baroni Urbani and De Andrade (1994) described *Acanthognathus poinari* from Dominican Amber and offered a phylogeny for the known species.

Among the putative synapomorphies that distinguish the dacetine ants from the other tribes are the presence of a cuticular process on the inner margin, close to the base of the mandible (basimandibular process) and also the presence of an impression or pair of impressions located medially on the labral shield. In *Acanthognathus* the basimandibular process is hypertrophied and it take part in mandibular locking mechanism, whereas the labral impression is secondarily lost because the labrum is secondarily reduced in this genus (Bolton 1998; Baroni Urbani & De Andrade 2007).

In Colombia, the genus is currently represented by two species *A. teledectus* (Valle del Cauca) and *A. ocellatus* (Meta) (Fernández *et al*. 1996; Fernández & Sendoya 2004). In this contribuition we review the genus for the country, including the description of a new species and new records of species in Colombia. A taxonomical key, to identify all the known species, is offered.

Materials and Methods

Measurements were made using a stereomicroscope Wild MZ8 at 80 magnifications and a fiber ring lamp. Pictures were taken using an Leica Camera D-LUX E with 8MP ajusted to Leica Stereoscope S8AP0 with Automontage Program CombineZ5. All measurements are provided in mm.

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Head Length (HL): Maximum length of head, in full-face view, from the anterior clypeal margin to the mid point of the occipital margin. Head Width (HW): Maximun width of head, in full face view, excluding eyes. Mandible Length (ML): Exposed length of the closed mandibles beyond clypeal marging to mandibular apex, in full-face view. Eye length (EL): maximun diameter of compund eye. Scape length (SL): maximum distance of the antennal scape, in full-face view, excluding the basal condyle. Weber length (WL): Mesosoma length, in lateral view, from the anterior point of the pronotum to the posterior point of metapleuron. Petiole length (PL): in lateral view. Postpetiole length (PPL): in lateral view. Gaster length (GL): in lateral view. Total length (TL): HL + ML + WL + PL + PPL + GL. Cephalic Index (Cl): (HW/HL)*100. Mandibular Index (MI): (ML/HL)*100. Scape Index (SI): (SL/HW)*100. Scape - Mandibular Index (SMI): (SL/ML)*100.

Collections

We visited the following collections: IAvH, Insect Collection, Instituto Humboldt, Claustro de San Agustín, Villa de Leyva, Colombia. ICN, Insect Collection, Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Bogotá D.C., Colombia.

Taxonomic treatment

Acanthognathus Mayr

Acanthognathus Mayr 1887: 578. Type-species: *Acanthognathus ocellatus* Mayr 1887: 579, by monotypy.

Species in Colombia

Acanthognathus brevicornis M.R. Smith
(Fig. 1).

Acanthognathus brevicornis M. R. Smith 1944: 151. Holotype worker and paratype queens, PANAMA: Canal Zone, Barro Colorado Island, vi-x. 1943 (*J. Zetek*).

Brown and Kempf (1969) described the sculpture of *A. brevicornis* as more effaced, more shining than in *A. ocellatus*, but not as much as in *A. teledectus*. The fossae on head and alitrunk of *A. brevicornis* tend to be smaller, shallower, and more widely spaced, with corresponding interspaces broader, smoother, and shinier.

Besides this, *A. brevicornis* is distinguishable from others species of the genus by the presence of 2-5 irregular denticles in the preapical area of inner borders of mandibles and by its shorter scapes, whose length are markedly less than mandible length (Brown & Kempf 1969).

Acanthognathus brevicornis has been previously recorded from Brazil and Panama (Kempf 1964; Smith 1944). This is the first record of this species for Colombia.

Material examined. COLOMBIA. **Quindío**. 3 workers and 2 gynes. Quimbaya. Vda. La Española. Fca. El Ocaso. 1100 m. 4°37'02"N 75°47'09"W. 14-ene-2000. J. Sossa, Leg.; 3 workers. Génova. Vda. El Recreo. Fca. Las Mercedes. 1315 m. 4°13'04"N 75°46'40"W. 17-feb-2000. J. Sossa, Leg.; 1 worker. Quimbaya. Vda. Trocaderos. Fca. La Mejorana. 1200 m. 4°36'32"N 45°44'34" W. 7-nov-1999. E. González, Leg. **Valle del Cauca.** 1 worker. Bosque del Medio, 950 m. 4-abr-1992. J. Bustos.; 1 gyne. Mpio. Cairo. Vda. Buenos Aires. Fca. El Pital. 1690 m. 4º45'02.93"N 76°11'54.69"W. Bosque Secundario. Winkler. 9-abr-2003. J. Henao. [All in IAvH].

Acanthognathus laevigatus, new species
(Figs. 2-4)

Holotype: 1 worker. COLOMBIA. **Nariño.** Barbacoas. Altaquer. Reserva Natural Rio Ñambi. "El Espingo". 1°18'00''N 78°05'00''W. 1242-1258 m. 14-Jan-2006. Sandra Cabrera, Leg. [ICN].

Worker diagnosis: Posterior excision of head rounded, not V-shaped as in *A. rudis*. Eyes larger than usual (nearly ¼ of head length), with about 100 facets, weakly convex, and located towards the dorsum of head. Mandibles with respect to head length relatively short (about ¾ of head length), resembling *A. ocellatus* and *A. rudis*, lacking preapical teeth or denticles, showing only the trigger hairs on the masticatory margin arising from the submedian welts. Humeral angles with tubercles strongly projecting. Propodeal teeth long and diverging from propodeum. Petiole with a low and rounded node in lateral view and with peduncle about 1,5 times as long as the node. Body completely smooth and shining. Body lacking fossae and any rugulose-punctulate sculpture. Standing pilosity absent on the body. Color of body brown, legs lighter.

Measurements. Holotype: HL 0,94, HW 0,67, EL 0,21, ML 0,67, SL 0,76, WL 1,00, PL 0,68, PPL 0,30, GL 0,95, TL 4,54 CI 71, MI 71, SI 113, SMI, 113.

Etymology. Latin term, *laevigatus*, referring to the smooth and shiny integument of this species.

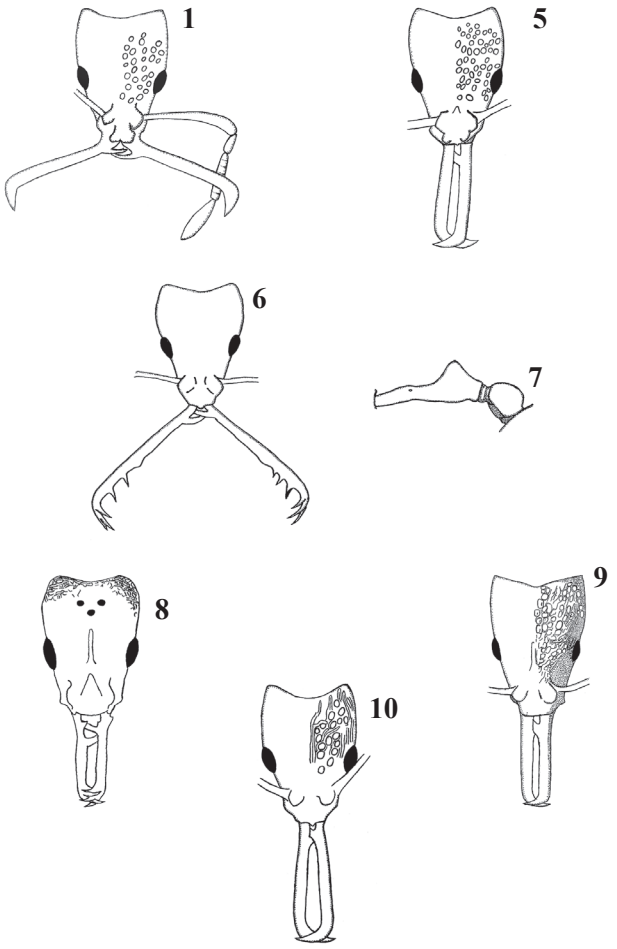
Comments. This species can be easily differentiated from any other species of the genus by having their body completely smooth and shining and for lacking any sculpture in the body. Other species in which the integument is also known to be smooth and shining (*A. teledectus* or *A. brevicornis*) have some kind of sculpture. It could be argued that *A. laevigatus* is just a variation of *A. teledectus* or *A. brevicornis* either but this species have characters that markedly contrast with *A. laevigatus*, this has not the extremely long, heavily-armed mandibles of *A. teledectus* or the shorter scapes of *A. brevicornis*.

Only one specimen was found. Information about the biology or natural history of this species are unknown.

Acanthognathus ocellatus Mayr
(Fig. 5)

Acanthognathus ocellatus Mayr, 1887: 579. Holotype worker, BRAZIL: Sta. Catarina.

This species is described by Brown and Kempf (1969) as "average" or "typical" member of the genus by many characters that shares with others species: Posterior excision in full-face view evenly semicircular (like in *A. brevicornis* or *A. laevigatus*). Mandibles slender and more than 0,75 the head length, entering in the range between the shorter mandibles of *A. rudis* and longer mandibles of *A. teledectus*, lacking preapical denticles on their inner margins.



Figures 1, 5-10. *Acanthognathus* spp. **1.** *Acanthognathus brevicornis*, worker. Head in full-face view showing sculpture on the left side of the head. **5.** *A. ocellatus*, worker. Head in full-face view showing sculpture on the left side of the head. **6.** *A. teledectus*, worker. Head in full-face view. **7.** *A. stipulosus*, worker. Petiole and postpetiole in lateral view (redrawn from Brown and Kempf 1969). **8.** *A. poinari*, queen. Head in full-face view showing transverse rugulae on the posterior cephalic angles (redrawn from Baroni Urbani & De Andrade 1994). **9.** *A. rudis*, worker. Head in full face-view showing sculpture on the left side of the head. **10.** *A. lentus*, worker. Head in full-face view showing sculpture on the left side of the head.

The scupture also are average inside the genus. Having *A. rudis* the most densely and nearly opaque rugulose and punctulate sculpture and *A. laevigatus* lacking completely of this, *A. ocellatus* has the fossae of the sculpture crowded on the anterior part of the cephalic dorsum, mostly well-separed on the posterior half of the head, with smooth or nearly smooth shining interspaces (Brown & Kempf 1969).

Material examined. COLOMBIA. **Cundinamarca.** 2 workers. Medina. Cerro del Cura. 700 m. F. Fernández, Leg. (Missing date of collection, method of collection, type of habitat, and GPS reading) [ICN]. **Risaralda.** 1 gyne. Santa Cecilia. Potrero 550 m. 25-feb-1992. [ICN]. **Valle del Cauca.** 1 worker. Mpio. Cairo. Vda. Buenos Aires. Fca. El Pital. 1690 m. 4º45’02.93”N 76º11’54.69”W. Bosque Secundario. Winkler sample. 9-abr-2003. J. Henao, Leg.; 2 workers. PNN Farallones de Cali Anchicaya. 3°26’00”N 76°48’00”W. 730 m. Winkler sample. 21-23-jul-2000. S. Sarria, Leg. M.1128. [IAvH].

Acanthognathus teledectus Brown and Kempf (Fig. 6).

Acanthognathus teledectus Brown and Kempf 1969: 105, fig. 11. Holotype worker, COLOMBIA: Dept. Valle. Municipio de Buenaventura. Bajo Calima. Cartón de Colombia. 16-mar-1967 (*R. B. Root and W. L. Brown*).

As mentioned earlier, *A. teledectus* can be distinguished from the other species of the genus by the presence of longer mandibles (holotype worker with MI = 121) with long spiniform teeth before the apex (Brown & Kempf 1969). Head and clypeus very narrow. Integument mostly smooth and shining with a few indistinct fossae on the anterior part of head and minutely and densely punctulate sculpture in lower sides of alitrunk, also in front and behind of petiolar peduncles (Brown & Kempf 1969).

Material examined. COLOMBIA. **Cauca.** 1 worker. Buenaventura. PNN Isla Gorgona. 126 m. 2º58’01”N 78º11’01”W. 2-feb-2000. D. Campos, Leg. [IAvH]. **Quindío.** 1 gyne. Quimbaya. Vda. La Española. Fca. El Ocaso. 1100 m. 4º37’02”N 75º47’09”W. 14-ene-2000. J. Sossa, Leg. [IAvH]. **Nariño.** 1 worker. Mpio. Barbacoas. Cgto. Altaquer. Vda. Barro. R.N. Río Ñambi. [ICN]. **Valle del Cauca.** 1 worker. PNN Farallones de Cali. Anchicaya 3º26’00’’N 76º48’00’’W. 900m. Winkler. 24-abr-2001. S. Sarria, Leg. [IAvH].

Discussion and Comments

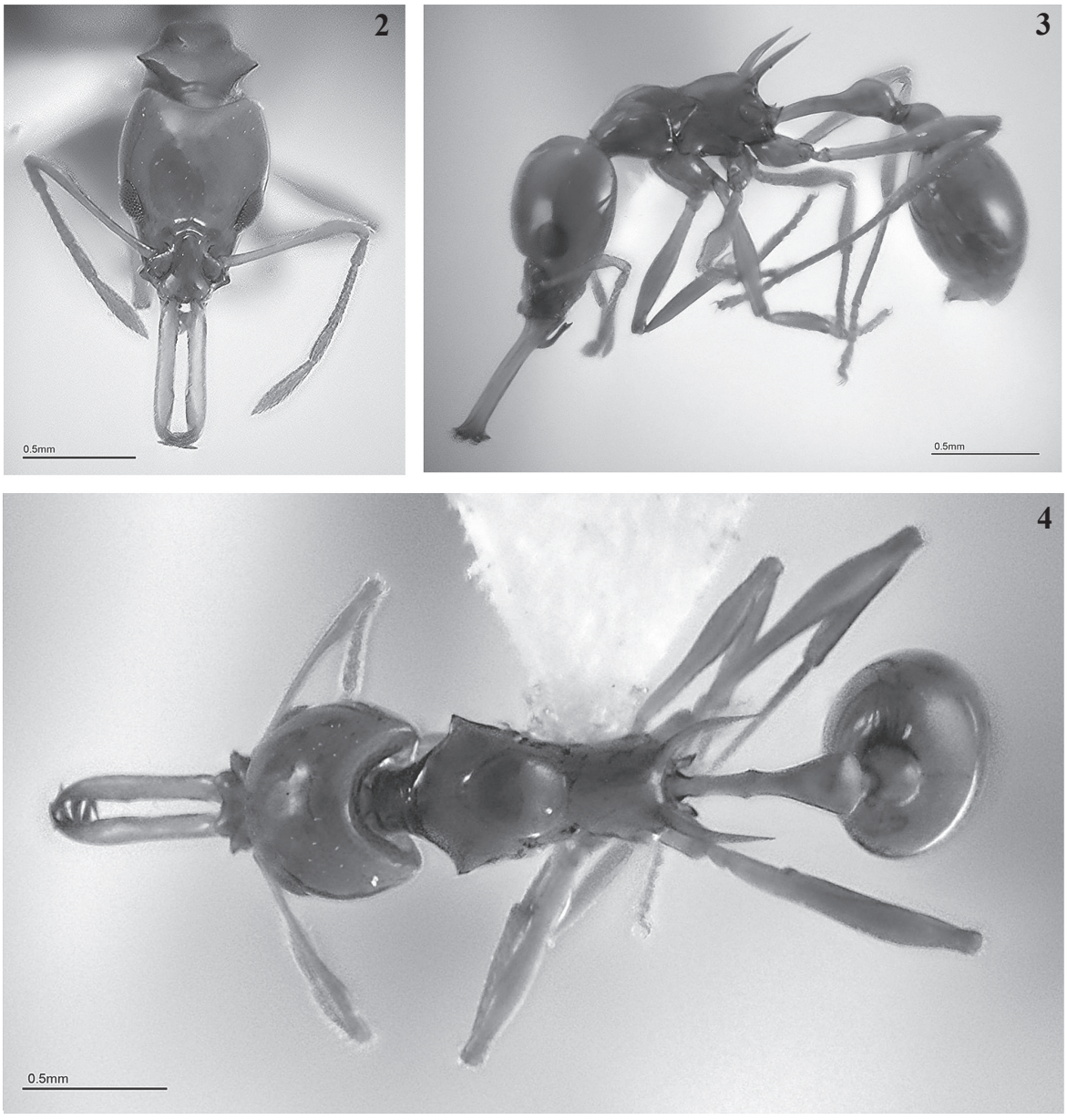
None new species was found in this group since the revision by Brown and Kempf (1969). Furthermore, no other species of the genus contrasts so strongly with the others. Sculpture on the body, mainly on the head and mesosoma, is a character of great importance and its presence and degree vary among species within the genus. The new species *Acanthognathus laevigatus* completely lacks body sculpture, being totally smooth and shining, which makes it a unique species in *Acanthognathus*, except by *A. teledectus*. In *Acantognathus teledectus* the dorsum of head is also smooth and shining, but the mandibles are clearly longer than head, unique trait in the genus.

Baroni-Urbani and De Andrade (1994) studied the phylogenetic relationships of all the species in *Acanthognathus* using morphological data and proposed the following relationships: (((*A. brevicornis* + *A. teledectus*) + *A. poinari*) + (*A. lentus* + (*A. ocellatus* + *A. rudis*)) + *A. stipulosus*). In accordance with the aforementioned relationships, *A. teledectus*, *A. brevicornis,* and *A. poinari* are closely related due to their poorly sculptured integument. *A. laevigatus* would belong to this complex of species and perhaps would be the sister species of *A. teledectus*.

The geographic distribution of *A. laevigatus*, in the Southwestern Colombia is similar to the geographic distribution of *A. teledectus,* suggesting a sympatric pattern of speciation as proposed by Baroni Urbani and De Andrade (1994). It would be of great importance to intensify ant sampling in this and other areas of the country to better understand the distribution of the species in this genus.

The species of *Acanthognathus* based on workers and females (Modified from Brown and Kempf 1969)

1. Dorsum of head smooth and shining, without any fossae or rugulose-punctulate sculpture **2**



Figures 2-4. *Acanthognathus laevigatus*, n. sp., holotype worker. **2.** Head in full-face view **3.** Body in lateral view **4**. Body in dorsal view.

– Dorsum of head sculptured, at least with numerous distinct round fossae on the disc, intervals smooth or rugulose.....**3**

2(1). Mandibles longer than head in full-face view, each with two or three long spiniform teeth before the apex (Fig. 6); anterior part of head, especially in the region in front of the eyes with a few indistinct fossae; lower portions of sides of mesosoma and petiolar peduncle, in front and behind, minutely and densely punctulate ..... ***A. teledectus***

– Mandibles not longer than head in full-face view, preapical inner borders unarmed; body completely smooth and shining (Figs. 2-4) .....***A. laevigatus* n. sp.**

3(1). Petiole with very long, slender peduncle, about three times as long as its node, which is short and transverse as seen from above (Fig. 7) .....***A. stipulosus***

– Petiolar peduncle slender, but less than twice as long as its node, which is oval and at least as long as broad as seen from above **4**

4(3). Presence of transverse rugae on the posterior cephalic angles (fossil ant from Dominican amber; Fig. 8)..***A. poinari***

– Transverse rugae on the posterior cephalic angles absent **5**

5(4). Antennal scapes short, chord less than 90% as long as mandibles seen in dorsal view (Fig. 1); preapical area of inner mandibular border with (usually two or more) irregular denticles .....***A. brevicornis***

– Antennal scapes with chord about as long as, to much longer than, the mandibles as seen in dorsal view; inner mandibular

borders without preapical denticles, though a submedian welt may be present **6**

6(5). Mandibles shorter (MI 60-75); dorsum of head completely, densely, and rather finely rugulose, with interspersed fossae numerous, small, and crowded, so that the surface, including the area around the eyes, is essentially opaque (Fig. 9) ..... ***A. rudis***

– Mandibles longer (MI > 75); dorsum of head loosely sculptured and more or less shining, fossae large and shallow, with smooth spaces or simple longitudinal rugulae between some rows; at least a strip bordering each eye mesially nearly smooth, shining **7**

7(6). Fossae on posterior half of dorsum of head smaller, mostly separated by flat, smooth spaces (Fig. 5) ***A. ocellatus***

- Fossae on posterior half of dorsum or head large, mostly contiguous or separated by single, simple longitudinal rugulae (Fig. 10)..... ***A. lentus***

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