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NOTES ON NATHAN BANKS' SPECIES OF THE MITE GENUS *CARABODES* (ACARI: ORIBATEI)

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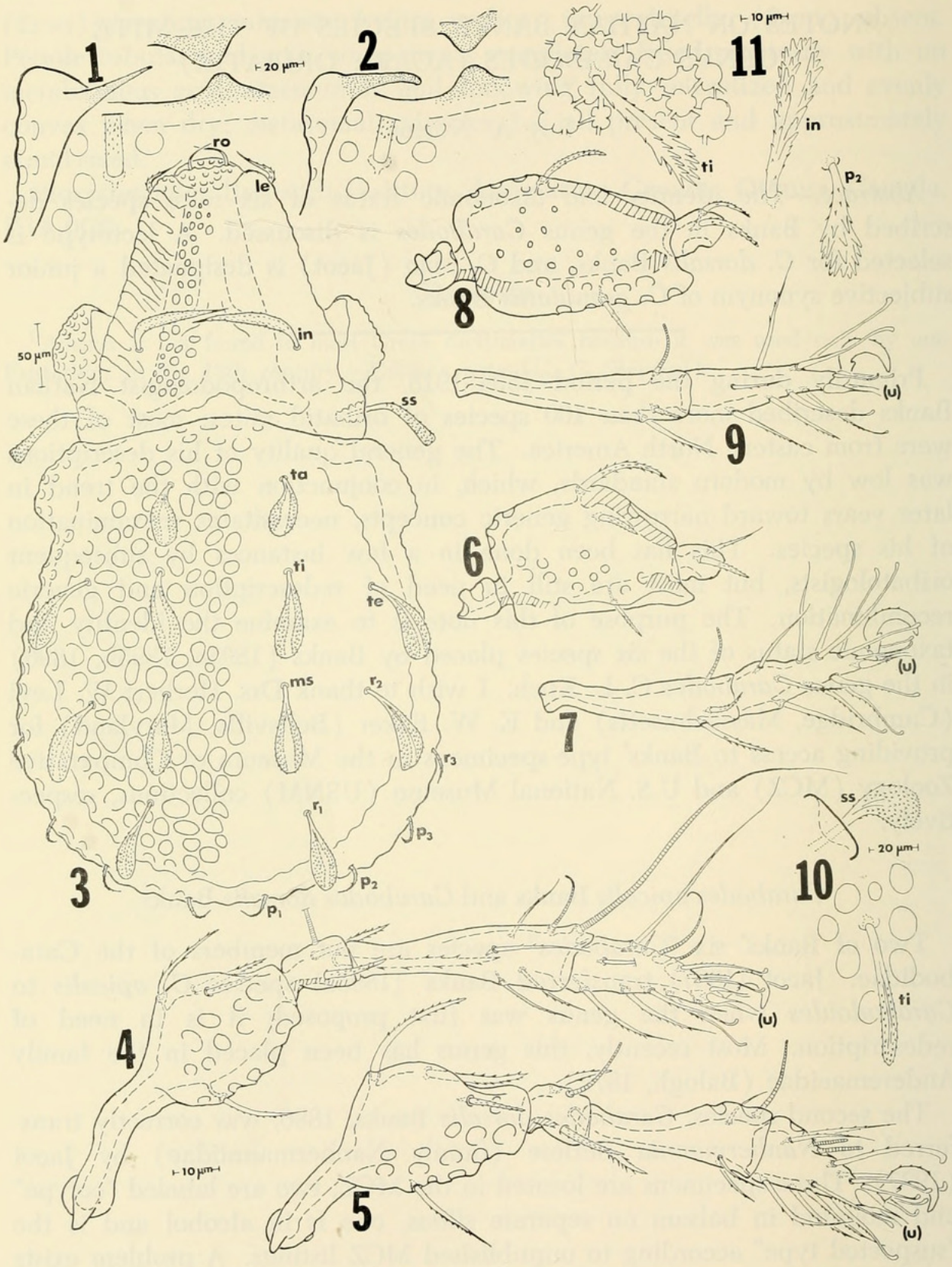
Abstract.—The identity and taxonomic status of six mite species described by Banks in the genus *Carabodes* is discussed. A lectotype is selected for *C. dorsalis* Banks, and *C. omo* (Jacot) is designated a junior subjective synonym of *C. granulatus* Banks.

Primarily during the period 1894–1915, the arthropodologist Nathan Banks described more than 100 species of oribatid mites; most of these were from eastern North America. The general quality of his descriptions was low by modern standards, which, in conjunction with the trend in later years toward narrowing generic concepts, necessitates reexamination of his species. This has been done in a few instances by subsequent oribatologists, but most are still in need of redescription and generic recombination. The purpose of this note is to examine the identity and taxonomic status of the six species placed by Banks (1895a, 1895b, 1896) in the genus *Carabodes* C. L. Koch. I wish to thank Drs. Herbert W. Levi (Cambridge, Massachusetts) and E. W. Baker (Beltsville, Maryland) for providing access to Banks' type-specimens in the Museum of Comparative Zoology (MCZ) and U.S. National Museum (USNM) collections, respectively.

Carabodes apicalis Banks and *Carabodes dorsalis* Banks

Two of Banks' six "*Carabodes*" species are not members of the Carabodidae. Jacot (1937) transferred Banks' (1895a) species *C. apicalis* to *Carabodoides* when the genus was first proposed; it is in need of redescription. Most recently, this genus has been placed in the family Anderemaeidae (Balogh, 1972).

The second species, *Carabodes dorsalis* Banks, 1896, was correctly transferred to *Nanhermannia* Berlese (family Nanhermanniidae) by Jacot (1937). Three specimens are located in the MCZ; two are labeled "cotype" and mounted in balsam on separate slides, one is in alcohol and is the "suspected type" according to unpublished MCZ listings. A problem exists because one of the two slide-mounted specimens (the ventral mount) is not this species; it appears conspecific with *Carabodes brevis* Banks. It has obviously been remounted since its deposition, but there is no record of who mounted or labeled the specimen. The second slide (a lateral mount) bears a correctly identified specimen; it is labeled a "cotype" in



Figs. 1–2. *Odontocepheus elongatus*. 1, Left humeral region of specimen from England. 2, Left humeral region of specimen from New York. Figs. 3–9. *Carabodes niger*. 3, Dorsal aspect (legs removed). 4, Leg I. 5, Leg II. 6, Femur and genu of leg III. 7, Tibia and tarsus of leg III. 8, Femur and genu of leg IV. 9, Tibia and tarsus of leg IV. Fig. 10. *Carabodes brevis*, sensillus (*ss*) and notogastral seta *ti* of cotype. Fig. 11. *Carabodes granulatus*, prodorsal seta *in* and notogastral setae *ti* (with integumental sculpturing) and p_2.

A. P. Jacot's handwriting and was probably originally mounted from alcohol by him. The alcoholic specimen still carries a label in Banks' handwriting. I hereby designate the single alcoholic specimen as the lectotype of *Carabodes dorsalis* Banks and the laterally mounted "cotype" as a paralectotype. Species concepts in *Nanhermannia* have not improved since Hammen's (1959) clarification of the identity of the type-species, *N. nana* (Nicolet). Questions raised by Jacot (1937) and Hammen (1959) on the synonymy of Banks' species with species described from Europe will have to be answered by population studies, not simply redescription of type-specimens.

Carabodes oblongus Banks

Banks himself (1895a) was the first to indicate the need for the removal of this species from *Carabodes*, but its present genus, *Odontocepheus* Berlese, had been proposed for half a century before Johnston (1965) effected the recombination. I have examined specimens of the type-species of *Odontocepheus*, *O. elongatus* (Michael), from England and Scandinavia and compared them with the type-specimen of *O. oblongus* (MCZ) and a number of other specimens from the northeastern U.S. The size range of the American mites (505–610 μm) spans the measurements of my European specimens, and there are only two notable differences. The notogastral setae are relatively slightly shorter in the American specimens; setae of the series h_3, ps_3, ps_2, and ps_1, for example, do not extend posteriorly as far as the insertion of the next seta. Also, the spine-like apophysis which extends medially from the humeral region of the notogaster is shaped differently in the American specimens (Figs. 1 and 2).

My European material is limited, however; and considering the variation attributed to body length and setal shapes noted in European populations by Perez-Iñigo (1971), his synonymy of *O. oblongus* with *O. elongatus* (apparently without the benefit of seeing American specimens) seems justified on morphological grounds.

Carabodes niger Banks

This and the following two species are true members of the genus *Carabodes*, as it is conceived at this time. *Carabodes niger* is one of the largest species in the northeast. Banks' (1895a) original estimate of 0.5 mm is misleading; 17 cotypes in the MCZ and USNM collections ranged from 490–643 μm, total length (mean 580 μm). Most collections from New York and Ohio have been from fungal fruiting bodies (especially *Polyporus* spp.), but I have collected it from forest leaf litter in North Carolina. The following is presented as a more complete diagnosis of the species.

Integument strongly sculptured (Fig. 3), mostly with pit-like depressions

8–25 μm in diameter. Prodorsum with weak pitting and "V" shaped ridge between lamellae; lamellae mostly with transverse ridges instead of pits. Dorsosejugal groove deep, broad (cervical cavity of Sellnick and Forsslund, 1953). Seta *ro* smooth, attenuate; *le* flattened, acuminate, with small barbs; *in* lanceolate, flattened, dorsally covered with small barbs, tips usually crossing medially. Sensillus (*ss*) distally spatulate, with ventrally deflexed sides; dorsal surface with small barbs. Notogaster with distinct postero-lateral rim. Setae *ta*, *ti*, *te*, *ms*, r_1 and r_2 large, flattened, spatulate, 2.9–3.2 times longer than broad, dorsally covered with small barbs except along medial axis. Setae r_3, p_1, p_2 and p_3 setiform, with small barbs. Legs as in Figs. 4–9.

In the Barneby Center, Ohio population studied, setae r_3, p_1, p_2 and p_3 are somewhat longer, almost reaching the insertion of the next posterior seta. Also, the unguinal setae (*u*) of all tarsi are simply scale-like, lacking the distal attenuation present in the cotypes from Long Island.

The specific epithet *nigra* was used in the original description, but since *Carabodes* is a masculine noun, it was later emended to *niger* (Banks, 1904).

Carabodes brevis Banks

The holotype (labeled "type") is mounted in balsam and located in the MCZ, along with an alcoholic "cotype." As mentioned previously, the misidentified cotype of *Carabodes dorsalis* belongs to this species and may be a member of the original type-series which was wrongly labeled in later years.

This species is generally similar to *C. niger*, but the sensillus is short, strongly clavate and the central notogastral setae are much thinner, only slightly broadened distally (Fig. 10). Seta *in* is similar to that of *C. niger*, but slightly narrower. Setae r_3, p_1, p_2 and p_3 are slightly smaller than the central dorsal setae, but there is no strong dimorphism as in *C. niger*. The dorsosejugal groove is shallower (there is no cervical cavity) and the medial prodorsal ridge is absent. All three specimens in the MCZ are about 500 μm in length; Banks' (1896) original statement of 0.4 mm is erroneous.

Carabodes granulatus Banks

A single alcoholic specimen, the holotype, is located in the MCZ. This species can be distinguished from all other known American *Carabodes* species by means of the clavate, coarsely barbed notogastral and interlamellar setae, and the integumental sculpturing of the notogaster which gives the impression of small, interconnected "rosettes" (Fig. 11).

Examination of several cotypes of *Carabodes omo* Jacot (1937:241) from the USNM showed this to be a junior subjective synonym of *C. granulatus* (*new synonymy*). The species is common in sphagnum bogs in the northeastern U.S. and forest litter in North Carolina.

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