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THE ICHNEUMON-FLIES OF THE SUBFAMILY NEORHACODINAE, WITH DESCRIPTIONS OF A NEW GENUS AND THREE NEW SPECIES

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THE three species of Neorhacodinae described herein bring the Nearctic and Neotropical regions into the known distribution of this anomalous subfamily of Ichneumonidae, add a new genus, and increase to four the number of known species.

Subfamily Neorhacodinae

Rhacodinae RUSCHKA, Archiv für Naturg., vol. 88, Abt. A, Heft 5, p. 138, fig. 8, (June) 1922.

Neorhacodinae HEDICKE, Deutsche Ent. Zeitschr., p. 427, (Dec.) 1922.—WATERSTON, Entomologist, vol. 62, p. 97, fig. 1, 1929.

Neorhacodinae (Ruschka) ROMAN, Ent. Tidskr., vol. 44, Heft 3-4, p. 170, fig. 1, 1923.

Neorhacodidae HANDLIRSCH, Handbuch der Entomologie, vol. 3, p. 742, fig. 616, 1925.—FAHRINGER, Opuscula braconologica, vol. 1 (Lief. 1), p. 16, 1925.—BISCHOFF, Die Biologie der Hymenopteren, p. 11, 1927.—HANDLIRSCH, Handbuch der Zoologie, vol. 4, Insecta 2, p. 962, fig. 1057, 1933.

Microgasterinae SCHMIEDEKNECHT, Die Hymenopteren Nord- und Mitteleuropas, p. 359, fig. 61, 1930 (part).

Neorhacodinae (Handlirsch) FAHRINGER, Opuscula braconologica, vol. 4 (Lief. 1-3), p. 3, 1935.

Under the name *Rhacodes* the typical genus was originally described by Ruschka from a specimen reared as a parasite of the wasp *Spilomena troglodytes* Lind. Ruschka placed the genus in the Braconidae and erected for it the new subfamily Rhacodinae.

Hedicke, finding *Rhacodes* Ruschka preoccupied by the crustacean genus *Rhacodes* Koch, renamed it *Neorhacodes* and changed the subfamily name to Neorhacodinae.

Roman, tracing the missing wing veins by reflected light, concluded the genus to be ichneumonid and placed it in the Pimplinae.

Handlirsch (1925 and 1933) elevated the subfamily to family rank and for unexplained reasons dropped it between the Aphidiidae and Stephanidae.

Fahringer (1925) followed Handlirsch in treating the group as a family but later (1933) reduced it to subfamily rank in the Braconidae, where he related it to the Helconinae and Microgasterinae. His reason for so doing appears to have been convenience, which he permitted to outweigh the natural relationship pointed out by Roman.

Waterston also recognized *Neorhacodes* as ichneumonid and, while agreeing that Roman might be correct in placing it in the Pimplinae, suggested possible relationship to the Tryphoninae.

Bischoff, also recognizing it as an ichneumonid, agreed with Roman that it should stand close to the Pimplinae but did not place it definitely in that subfamily.

Schmiedeknecht, using the original name *Rhacodes*, placed the genus at the end of the Microgasterinae without including it in his key to the genera of that subfamily.

Roman, Bischoff, and Waterston are obviously correct in placing this curious genus in the Ichneumonidae rather than in the Braconidae. As shown by the figures published by Roman and Waterston the positions of all the typical veins of the ichneumonid wings can be seen by reflected light, except the intercubiti, which are eliminated by the confluence of radius and cubitus. One detail of the venation that both Roman and Waterston figured, but which neither mentioned, is the presence of the intercubitella instead of basella. This is an ichneumonid character.

In my opinion both Roman and Waterston were correct, if *Glypta* is allowed to stand in the Pimplini and the Mesoleptini are to be considered as tryphonine, for *Neorhacodes* belongs to the great complex of internally parasitic ichneumonids, characterized by the dorsally notched ovipositor (fig. 48) and including such apparently divergent groups as the Lissonotini and most of the Ophioninae and Mesoleptini. Despite their divergence I believe these three groups are more closely related to one another than are the Lissonotini to the rest of the Ichneumoninae or the Mesoleptini to the Tryphonini. Within this complex *Neorhacodes* most closely resembles the Lissonotini, but the anomalous venation, the 13-jointed antennae, and the unusual host relation justify recognition of the group in at least the tribal rank. For the present I prefer to retain the subfamily status.

KEY TO THE SPECIES OF NEORHACODINAE

1. Tergites 1-3 with distinct transverse furrows----- 2  
 Tergites 1-3 without transverse furrows (Brazil).  
     *Romaniella exsulcatus*, new genus and species
2. Antenna subclavate, penultimate joint as thick as long; ovipositor barely extending beyond apex of abdomen, sheath hardly as long as first tergite (Arizona)----- *Neorhacodes brevicauda*, new species  
 Antenna filiform, penultimate joint distinctly longer than thick; ovipositor strongly exerted, sheath half or more as long as abdomen----- 3
3. Sheath of ovipositor half as long as abdomen (Europe).  
     *Neorhacodes enslini* (Ruschka)  
 Sheath three-fourths as long as abdomen (Colorado).  
     *Neorhacodes longicauda*, new species

Genus NEORHACODES Hedicke

*Rhacodes* RUSCHKA, Archiv für Naturg., vol. 88, Abt. A, Heft 5, p. 138, fig. 8, (June) 1922.—SCHMIEDEKNECHT, Die Hymenopteren Nord- und Mitteleuropas, p. 359, fig. 61, 1930. (Preoccupied by *Rhacodes* Koch, 1856.)  
*Neorhacodes* HEDICKE, Deutsche Ent. Zeitschr., p. 427, 1922.—HANDLIRSCH, Handbuch der Entomologie, vol. 3, p. 742, 1925.—FAHRINGER, Opuscula braconologica, vol. 1 (Lief. 1), p. 16, 1925.—HANDLIRSCH, Handbuch der Zoologie, vol. 4, Insecta 2, p. 962, fig. 1057, 1933.—FAHRINGER, Opuscula braconologica, vol. 4 (Lief. 1-3), p. 3, 1935.  
*Neorhacodes* (Ruschka) ROMAN, Ent. Tidskr., vol. 44, Heft 3-4, p. 170, fig. 1, 1923.

Abdomen longitudinally striate or striato-shagreened, tergites 1-3 with deep transverse furrows, first tergite without longitudinal furrows apically; differing in these respects from the new genus *Romaniella*.

NEORHACODES ENSLINI (Ruschka)

*Rhacodes enslini* RUSCHKA, Archiv für Naturg., vol. 88, Abt. A, Heft 5, p. 138, fig. 8, 1922.—SCHMIEDEKNECHT, Die Hymenopteren Nord- und Mitteleuropas, p. 359, fig. 61, 1930.  
*Neorhacodes enslini* (Ruschka) HEDICKE, Deutsche Ent. Zeitschr., p. 427, 1922.—ROMAN, Ent. Tidskr., vol. 44, Heft 3-4, p. 170, fig. 1, 1923.—HANDLIRSCH, Handbuch der Entomologie, vol. 3, p. 742, 1925.—WATERSTON, Entomologist, vol. 62, p. 97, fig. 1, 1929.—HANDLIRSCH, Handbuch der Zoologie, vol. 4, Insecta 2, p. 962, fig. 1057, 1933.—FAHRINGER, Opuscula braconologica, vol. 4 (Lief. 1-3), p. 3, 1935.

During his visit to Washington in 1928 Waterston showed me the specimen on which his note was based. At that time I had no other specimen of the genus to compare with it for specific differences. The original and only description of *enslini* fits the new species described below as *longicauda* very closely except in the shorter ovipositor, the basally smoother third and fourth tergites, and the basally pale flagellum and paler legs.

All (3) of the specimens of *enslini* that have been recorded were associated with the minute wasp *Spilomena troglodytes* Lind.

## NEORHACODES LONGICAUDA, new species

*Female*.—Length 2.5 mm.

Head broader than thorax, shagreened; temples convexly receding; frons evenly convex, scrobes weakly impressed; eyes shorter than width of face, parallel within; face medially elevated and more shining; clypeus as long as face, shining, with a fringe of setae, each seta set in a deep puncture; malar space as long as basal width of mandible; antenna filiform, all flagellar joints longer than thick.

Thorax shagreened; pronotum in scrobe and mesopleuron above middle polished, the latter with a longitudinal elevation at about the middle; propodeum with median and lateral carinae strong, but apical carina weak.

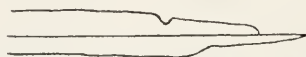


FIGURE 48.—Tip of ovipositor of *Neorhacodes longicauda*, new species.

Abdomen striato-shagreened, extreme apices of tergites 1-4 and entire fifth tergite polished; first tergite more strongly striate, transverse groove obsolete medially; tergite 4 with a shallow but distinct transverse groove, and tergite 5 with a faint trace of a groove; ovipositor sheath about three-fourths as long as abdomen.

Black; antenna dark brown, with pedicel paler; legs piceous, front and middle tibiae and tarsi (except apical joints) stramineous, hind tibia and tarsus fuscous; wings hyaline, venation dark stramineous, stigma largely fuscous, paler at base and apex, radix stramineous.

*Type locality*.—Four-mile Hill, 8 miles south of Steamboat Springs, Colo.

*Type*.—U. S. N. M. No. 53545.

One specimen from the C. F. Baker collection (No. 2030) captured by Charles Liebeck.

## NEORHACODES BREVICAUDA, new species

*Female*.—Length 2 mm.

Differs from *longicauda* as follows: Eyes slightly convergent below, malar space much shorter than basal width of mandible; antenna slightly subclavate, penultimate joint as thick as long; apical carina of propodeum strong; abdomen more coarsely striate, tergites 4 and 5 without traces of transverse furrows; ovipositor hardly extending beyond apex of abdomen, sheath hardly as long as first tergite.

Color as in *longicauda*.

*Male*.—Except in slightly smaller size, differs hardly at all from female.

*Type locality*.—Littlefield, Ariz.

*Type*.—U.S.N.M. No. 53546.

One female (type) and one of unknown sex (apex of abdomen gone) collected on *Covillea tridentata* Vail, April 15, 1932, at the type locality; and one male (allotype) from the C. F. Baker collection (No. 2064) taken at Tucson, Ariz., May 20, 1896, by R. E. Kinze.

**ROMANIELLA, new genus**

Differs from *Neorhacodes* Hedicke only in its entire lack of transverse furrows on the abdomen, in having the abdomen uniformly shagreened and mat without any longitudinal striation, and by the presence on each side of the first tergite of a narrow longitudinal groove extending forward from the posterior margin.

*Genotype*.—*Romaniella exsulcatus*, new species.

I take pleasure in dedicating this interesting genus to Dr. A. Roman, of the Stockholm Museum, in appreciation of his many courtesies and of his discriminating studies on the Ichneumonidae.

**ROMANIELLA EXSULCATUS, new species**

*Female*.—Length 2 mm.

Head broader than thorax, finely shagreened and mat; temples convex, receding; frons weakly convex; eyes slightly shorter than width of face, parallel; face medially polished and slightly elevated; clypeus polished, longer than face, apex with a fringe of setae, the setiferous punctures inconspicuous; malar space hardly as long as basal width of mandible; antenna weakly subclavate, penultimate joint as thick as long.

Thorax mat, shagreened, mesopleuron posteriorly and metapleuron more shining; notaulices faintly impressed; longitudinal and apical carinae of propodeum moderately strong.

Abdomen uniformly shagreened, more coarsely so than thorax, only narrow apices of tergites 1-4 and the whole of 5 polished; ovipositor sheath nearly two-thirds as long as abdomen.

Black; antenna stramineous at base, becoming gradually darker to brown at apex; legs stramineous, coxae and hind femur piceous, hind tibia apically and apical tarsal joints fuscous; wings hyaline, venation and radix stramineous, stigma piceous with base and apex pale.

*Type locality*.—Campinas, São Paulo, Brazil.

*Type*.—U.S.N.M. No. 53547.

One female reared from an old cotton boll, September 25, 1932, by H. F. G. Sauer.