A. S. MENKE

NEW SOUTH AMERICAN GENERA AND SPECIES OF THE TRIBE BOTHYNOSTETHINI

(Hymenoptera; Sphecidae; Larrinae)

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NEW SOUTH AMERICAN GENERA AND SPECIES OF THE TRIBE BOTHYNOSTETHINI (Hymenoptera; Sphecidae; Larrinae)

Por A. S. MENKE*

RESUMEN

Nuevos géneros y especies sudamericanos de la tribu Bothynostethini. — La tribu Bothynostethini es redefinida y se ha incluido una clave para sus 4 géneros. Amén de *Bothynostethus* Kohl y *Scapheutes* Handlirsch, la tribu incluye 2 géneros nuevos, *Willinkiella* de Argentina y *Bohartella* de Brasil. *Bothynostethus* y *Willinkiella* son colocados en la subtribu Bothynostethina, y *Scapheutes* y *Bohartella* en la subtribu Scapheutina. Hay una clave para las subtribus y géneros y una lista de las especies. *Willinkiella argentina* y *Bohartella scapheutoides* son descriptas como nuevas.

The following new taxa have been discovered during research directed towards a world revision of the genera of the Sphecidae. The new genera belong to the tribe Bothynostethini, subfamily Larrinae, which is defined below.

Tribe Bothynostethini W. Fox, 1894

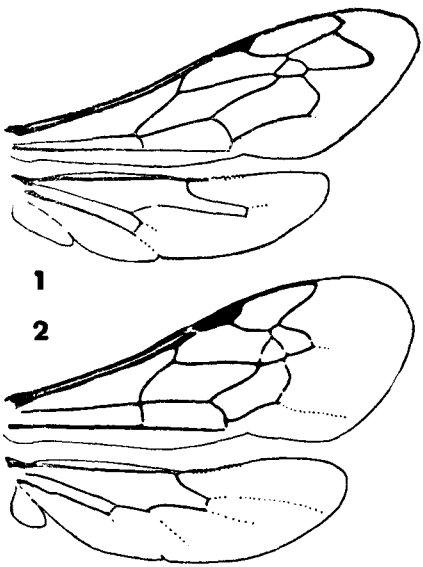
Diagnostic characters.

Inner orbits of eyes converging below (except in *Willinkiella*); ocelli normal; malar space very narrow or lacking; pronotal collar narrow, about as high as scutum; propodeum short, dorsal enclosure approximating a triangle when defined; both sexes with a pygidium which is covered with setae as in *Tachytes*; forewing with three submarginal cells, second petiolate and usually receiving both recurrent veins (first interstitial or going to I in some *Bothynostethus*); hind wing with small jugal lobe, never more than one-half length of anal area and frequently shorter; female foreleg with a weak tarsal rake; midcoxae separated, hind coxae contiguous; hind femur thickened towards apex, apex obliquely truncate (truncation rather weak in some male *Bothynostethus*).

* Research supported by a grant from the National Science Foundation, GB - 3074.

Discussion.

Fox (1894) proposed the tribe Bothynostethini for two genera, *Bothynostethus* and *Plenoculus*. However, these two genera obviously are not closely related. *Plenoculus* belongs in the larrine tribe Miscophini. The Bothynostethini as defined here includes the genera *Bothynostethus*, *Scapheutes* and two new genera, *Willinkiella* and *Bohartella*. Previous authors such as Kohl (1896) and Handlirsch (1925) considered *Bothynostethus* and *Scapheutes* to belong in the Nyssoninae and related them to *Alysson*. However, Krombein (1951) placed *Bothynostethus* in the Larrinae and this arrangement seems more logical. The placement of the Bothynostethini



Figures 1-2. — Wings of: 1. *Scapheutes brasiliensis* Handlirsch, 2. *Bothynostethus distinctus* Fox.

in the Larrinae is strengthened by the discovery of the new genus *Willinkiella*, the morphology of which bridges the structural gap which previously existed between *Bothynostethus* and *Scapheutes* and the rest of the Larrinae. *Willinkiella* is undoubtedly closely allied with *Bothynostethus*, but if it were not for the club-like hind femur, *Willinkiella* would certainly be placed in the larrine tribe Miscophini.

The most distinctive features of the Bothynostethini are: the club-like hind femur with its obliquely truncate apex (figs. 3-4), the petiolate second submarginal cell (figs. 1-2), and the convergence of the inner orbits below (except in *Willinkiella*). The hind

femur is most characteristic and similar modifications in Larrinae are found only in some Larrini (including Tachytini), especially *Tachytes,* but here the apical truncation is smaller and the femur does not gradually thicken towards the apex. The Larrini differ in two important respects from the Bothynostethini: ocelli deformed and jugal lobe of hind wing large.

Hind femora of the type found in the Bothynostethini are found in two other subfamilies of the Sphecidae: *Entomosericus,* an Old World nyssonine genus; and various genera of the philanthine tribe Cercerini (*Cercerus* for example). *Entomosericus* is similar in several respects to the genera of the Bothynostethini and further studies may indicate a relationship between the two. The African genus *Odontosphex* Arnold, the affinities of which are still unclear, also has club-like and obliquely truncate hind femora.

Distribution.

The Bothynostethini is a New World group and is almost exclusively tropical with only one or two species of *Bothynostethus* reaching the temperate regions of North America.

Systematics.

The four genera recognized here fall into two groups based on wing venation, indicating that evolution has proceeded along two different lines in this tribe. One group, the subtribe Bothynostethina, includes *Bothynostethus* and *Willinkiella,* and is characterized mainly by the media of the hind wing arising from M + Cu after crossvein cu-a (fig. 2). The other subtribe Scapheutina, includes *Scapheutes* and *Bohartella.* The media arises before cu-a in this subtribe (fig. 1). Other differences between the two subtribes are apparent in the form of the marginal cell and submarginal III. The genitalia and male sternite VIII also differ in the two subtribes. The volsella is in the form of a rolled plate, and the eighth sternite is truncate apically (fig. 5) in the Bothynostethina. In the Schapheutina the volsella is represented by a small plate at the base of each gonostyle, and the eighth sternite is bispinose apically (fig. 6).

Biology.

Bothynostethus is the only genus for which there is any ethological data. Cazier and Mortenson (1965) observed *B. distinctus*

Fox in Arizona. The nest was in the ground. These authors collected a nesting female that was flying with her prey, a chrysomelid beetle of the genus *Monoxia*.

WILLINKIELLA * new genus

Description.

Inner orbits of eyes essentially parallel (fig. 8); antenna short, flagellomeres about as broad as long (except I) (fig. 8); gena swollen giving head a square appearance in dorsal view; occipital carina strong but disappearing below well before reaching hypostomal carina; outer margin of mandible with a prominent angle or tooth, inner margin with two mesal teeth in female (fig. 8), one in male; mouthparts moderately long; labrum small, hidden; propodeal surface smooth, without posterior areolation, dorsal enclosure not defined (fig. 13); mesopleuron without an omaulus, episternal sulcus curving forward ventrally, ending at anterior margin of mesosternal area; gastral tergites and sternites simple; pygidium covered with dense hair in both sexes; male sternite VIII as in fig. 5; volsella of male genitalia as in *Bothynostethus*, that is, a flat plate which is rolled, thus appearing C shaped in side view; male front coxa broadly, longitudinally channeled, and male front trochanter shallowly concave basally (fig. 12); pulvilli moderate in both sexes; marginal cell of forewing acute apically (similar to fig. 2) second submarginal cell receiving both recurrent veins, outer veinlet of third submarginal cell ending at about middle of marginal cell, basal vein of forewing (media) diverging from M + Cu before (based) of crossvein cu-a; media of hind wing diverging from M + Cu after crossvein cu-a (similar to fig. 2).

Type of genus: *Willinkiella argentina* n.sp.

Distribution: Known only from Argentina.

Included species: *Willinkiella argentina* n.sp. The description of *Pisonopsis argentinus* Schrottky (1909) agrees quite well with *Willinkiella argentina* n.sp. and the latter may prove to be conspecific with Schrottky's species when its type is examined.

Discussion.

This genus is most closely allied with *Bothynostethus* as indicated by their similar wing venation and male genitalic structure.

* This genus is named in honor of Dr. Abraham Willink, one of South America's leading wasp taxonomists.

However, the parallel inner orbits and the smooth propodeum are diagnostic. Also the external mandibular tooth of *Willinkiella* is distinctive when coupled with these two features. In most *Bothynostethus* the mandible is entire externally, the eyes are strongly converging below and the propodeum is areolate posteriorly.

Willinkiella argentina n. sp.

Holotype male: Length 9.5 mm.

Color: Black; clypeal disk with a bilobed yellow spot; scape yellow beneath, middle flagellomeres rust colored beneath; top of pronotal collar, top of pronotal lobe, scutellum, metanotum, and a small spot on mesopleuron behind pronotal lobe, yellow; gastral tergite I with a broad band of yellow on apical one half, tergite II narrowly yellow posterolaterally, apical one-third of III and IV with yellow bands, V with a transverse yellow spot apically and a smaller yellow spot laterally; tibiae and tarsi of front and middle legs rust colored; wings clear except for slightly infumate marginal cell.

Vestiture: Frons and clypeus with appressed golden hair; mesosoma with short white erect hair which is darker on scutum; gastral tergites with fine appressed silver hair (somewhat pruinose); pygidial hair brownish.

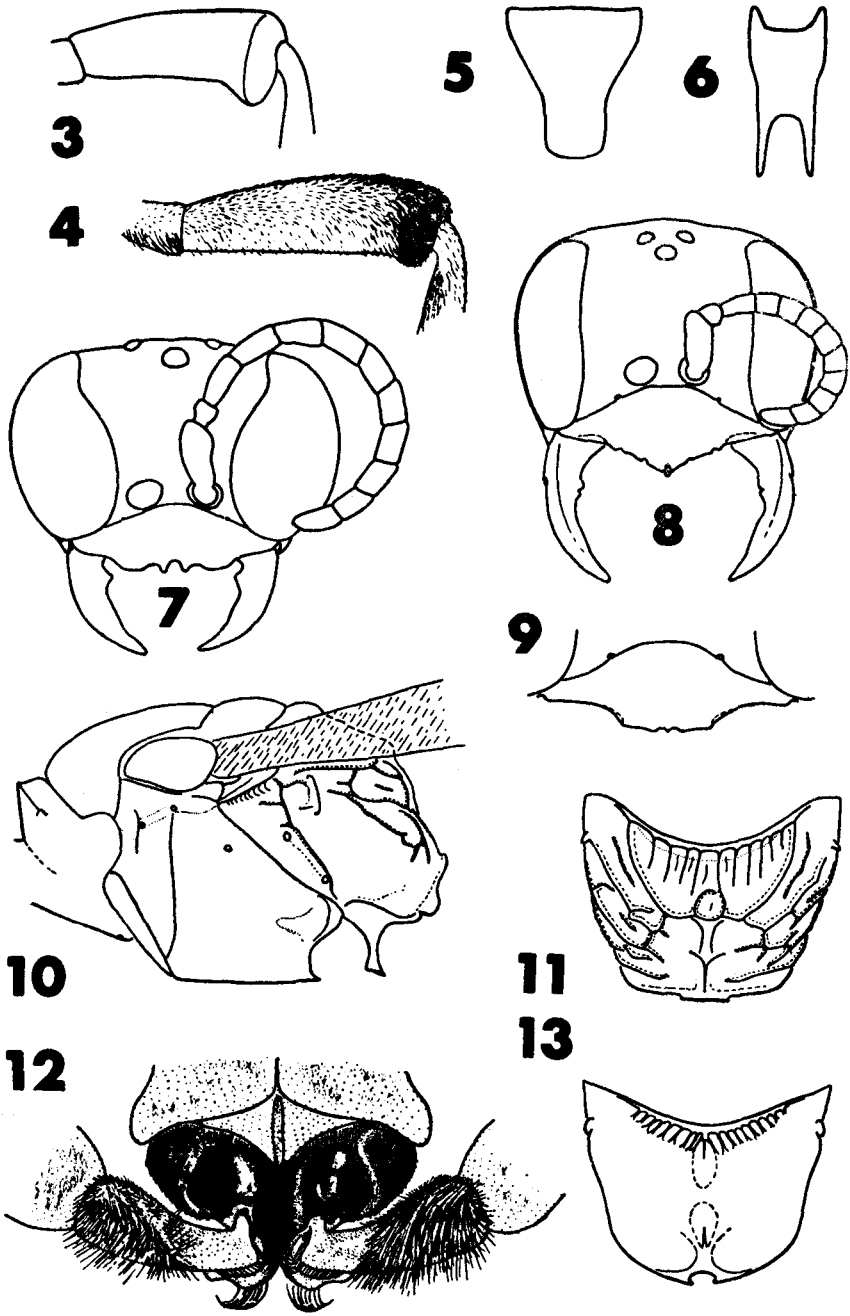
Structure: Clypeus with a median truncate lobe which has a weak central tooth (fig. 9), margin of lobe thickened behind; head and mesosoma shining, punctation very fine and indistinct; propodeal dorsum with a median longitudinal elliptical fova, and a transverse basal sulcus which is crossed by about twenty diagonal ridges (fig. 13); posterior face of propodeum with a median vertical sulcus which ends at dorsal fova; gastral tergites impunctate; forecoxa and trochanter as in figure 12; truncation of hind femur delineated apically by a marginal carina which disappears basally (fig. 4); outer surface of hind tibia covered with numerous fine spines whose sockets are slightly elevated basad thus giving the tibial surface a roughened appearance; eighth sternite as in figure 5.

Female: Length 9.5 to 10 mm.

Color: As in male except clypeus black, flagellomeres mostly black, pronotal lobe black or rust colored, mesopleuron sometimes without yellow spot behind pronotal lobe; gastral yellow about as in male except band on IV often interrupted and no yellow on V.

Vestiture: As in male.

Structure: Clypeal margin obtusely acuminate with a carinate median tooth, the carina extending partly onto clypeal disk, free



Figures 3-4. — Lateral view of left hind femur of: 3. *Bohartella scapheutoides* Menke, 4. *Willinkiella argentina* Menke.
Figures 7-8. — Anterior views of female head of: 7. *Bohartella scapheutoides* Menke, 8. *Willinkiella argentina* Menke.
Figure 9. — Male clypeus of *Willinkiella argentina* Menke.
Figure 10. — Lateral view of mesosoma of *Bohartella scapheutoides* Menke.
Figures 11 and 13. — Dorsal view of propodeum of: 11. *Bohartella scapheutoides* Menke, 13. *Willinkiella argentina* Menke.
Figure 12. — Front coxae and trochanters of male of *Willinkiella argentina* Menke.

margin with a weak lateral tooth (fig. 8); clypeal disk swollen, shining and impunctate near free margin but closely, rather finely punctate towards antennal sockets; vertex of head shinning; scutum shining, punctation varying from moderately, finely punctate to essentially impunctate; propodeal, gastral and femoral details as in male.

Types: Holotype male — Tacanas, Trancas, Tucumán, Argentina, II-1953, (J. M. Arnau) (deposited at the Instituto Miguel Lillo, Tucumán). Two male and four female paratypes from the following localities in Argentina: *La Rioja*: Illiar, I-1935, (Mateo Gomes). *Salta*: Cafayate, II-12-1948 and I-19-1950, (Monrós and Willink). *Tucumán*: Monte Bello, III-14-1947 (Monrós and Willink); Tucumán, II-1947 (J. Córdoba). Paratypes will be deposited at the Instituto Miguel Lillo and the University of California, Davis.

Discussion.

The only significant variation noted in the male is color. The yellow clypeal spot is absent in one male, and represented by two separate spots in the other (both from Cafayate). The mesopleural yellow spot is absent in both of these males, and both lack yellow on tergite V.

The yellow banded gaster is distinctive, and separates *W. argentina* from the species of *Bothynostethus*, all of which have entirely black gasters.

BOHARTELLA * new genus **

Description.

Inner orbits of eyes converging below (fig. 7), eye facets becoming progressively larger from top to bottom of eye, being largest near antennal socket (eyes have enlarged at the expense of the frons); antenna moderately long, flagellomeres elongate (fig. 7); gena not swollen but with a strong carina which runs parallel to outer orbit of eye from base of mandible to upper angle of eye (at vertex); occipital carina terminating at hypostomal carina just below its apex; outer margin of mandible entire, inner margin with one large subbasal tooth (fig. 7); mouthparts short; labrum small, hidden; propodeum areolate posteriorly; dorsal enclosure defined

* Named in honor of R. M. Bohart, one of North America's leading wasp taxonomists.

** Based on female, male unknown.

by ridges (fig. 11); mesopleuron with an omaulus (fig. 10), episternal sulcus meeting and crossing omaulus ventrally, extending to anterior margin of mesosternal area; pleuron behind pronotal lobe with a partial postspiracular carina (fig. 10); apical margin of gastral tergites I-IV thickened and double edged; pygidium covered with dense appressed hair; pulvilli moderate; wings very similar to figure 1.

Type of genus: *Bohartella scapheutoides* n.sp.
Distribution: Known only from Brazil.
Included species: *Bohartella scapheutoides* n.sp.

Discussion.

This genus is very similar to *Scapheutes* in wing venation, male genitalia, and male sternite VIII, but the presence of an omaulus, the lack of an external tooth on the mandible, the genal carina, the complete occipital carina, and the areolate propodeum are diagnostic. Furthermore, *Bohartella* lacks the subapical tergite pitrows found on the gastral tergites of *Scapheutes*. *Scapheutes* has a nearly complete acetabular carina on the mesosternal area, it being interrupted only at the midline. In *Bohartella* this carina is very incomplete, being represented as a short continuation of the omaulus.

Bohartella scapheutoides n.sp.

Holotype female: Length 9 mm.

Color: Black; pronotal collar with a transverse yellow sport at lateral angle; pronotal lobe with a small yellow spot at its posterior margin; wings clear.

Vestiture: Lower frons and clypeus with appressed silver hair; vertex of head, gena, and mesosoma with short erect silver hair, scutal hair brownish however; gastral tergites with pale appressed hair which under various lights gives different iridescent patterns; appressed pygidial hair brown.

Structure: Clypeus with two submedian teeth (fig. 7), sculpture of clypeus obscured by pubescence; frons densely punctate, the punctures larger towards eyes, smaller near median ocellus; vertex narrowly impunctate and shining between lateral ocellus and compound eye; ocellar triangle with a few large punctures; gena and vertex behind ocelli densely punctate, the genal punctures much finer but space between genal carina and outer orbit impunctate; pronotal collar with a transverse carina ante-

riorly, the carina forming a sharp angle laterally (fig. 10), anterior sloping face of collar densely punctate; pronotal side with several longitudinal ridges, interspaces impunctate, shining; moderately striatopunctate; metanotum rugose; mesopleuron shining; scutum densely coarsely longitudinally striatopunctate; scutellum moderately punctate, becoming denser posteriorly with a suggestion of striatopunctation; omaulal area shining, faintly and finely punctate; metapleuron shining, with fine punctures below, and few weak longitudinal ridges dorsally; propodeal enclosure impunctate shining, but with about 10 longitudinal ridges which are strongest basally, gradually fading towards apex and not reaching margin of enclosure (fig. 11); propodeal side shining but finely, densely punctate; posterior face of propodeum with a median longitudinal sulcus; propodeal areolation as in figs. 11, 13; apical tergal thickening diminishing on each succeeding segment, marginal thickness of tergite I about equal to one-half the diameter of median ocellus; gastral tergites I-IV moderately punctate, the punctures finer on each succeeding tergite, punctures of tergite I finer than those on mesopleuron; truncation of hind femur bounded entirely by a fine rim (fig. 3); outer face of hind tibia covered with numerous pale spines.

Types: Holotype female - Santarem, Brazil, April (collector unknown) (deposited in the University of California, Davis).

Discussion.

Until more material of this species has been collected (including the male) and studied, nothing can be said concerning its variation and distribution.

KEY TO THE GENERA OF THE TRIBE BOTHYNOSTETHINI

1. Media of hindwing arising from M + Cu after crossvein cu-a (fig. 2); third submarginal cell only slightly larger in area to second submarginal, veinlet forming outer margin of third submarginal meeting marginal cell near its middle (fig. 2) ..... subtribe Bothynostethina 2

   Media of hindwing arising from M + Cu before crossvein cu-a (fig. 1); third submarginal cell of forewing two or three times the size of second, veinlet forming outer margin of third cell meeting marginal cell near its apex (fig. 1) ..... subtribe Scapheutina 3

2. Inner orbits of eyes moderately too strongly converging below (similar to fig. 7); propodeal surface coarsely areolate posteriorly and posterolaterally (similar to fig. 11); outer margin of mandible usually entire; North and South America ..... *Bothynostethus* Kohl

Inner orbits essentially parallel (fig. 8); propodeal surface smooth posteriorly (fig. 13); mandible with a tooth on outer margin; Argentina ..... *Willinkiella* Menke

3. Mesopleuron without an omaulus; mandible with a tooth on outer margin; propodeum smooth posteriorly (similar to fig. 13); occipital carina ending before reaching hypostoma carina; each gastral tergite bearing a transverse pitrow subapically ..... *Scapheutes* Handlirsch

Mesopleuron with an omaulus (fig. 10); outer margin of mandible entire; propodeum coarsely areolate posteriorly (fig. 11); occipital carina meeting hypostomal carina just anterior to the latter's apex; gastral tergites without transverse pitrows. ..... *Bohartella* Menke

CHECKLIST OF GENERA AND SPECIES OF BOTHYNOSTETHINI

BOTHYNOSTETHUS Kohl, 1883

aberrans Ducke, 1092. Brazil

clypearis Ducke, 1904. Brazil

collaris Ducke, 1904. Brazil

distinctus Fox, 1891. eastern United States to Arizona

dubius Ducke, 1902. Brazil

kohlii Ducke, 1092. Brazil

nitens Handlirsch, 1888. Brazil

?*paraensis* Spinola *, 1853. Brazil (as Pison)

saussurei Kohl, 1883. Mexico

WILLINKIELLA Menke, 1967

argentina Menke, 1967. Argentina

?*argentina* Schrottky, 1909. Argentina (as *Pisonopsis*)

* Placement in *Bothynostethus* based on notes made by R. M. Bohart who studied the type in Turin, Italy. Spinola's original description places some doubt on this generic assignement however since he stated that the abdomen was yellow banded. No Bothynostethus known to me have yellow banded abdomen.

BOHARTELLA Menke, 1967

scapheutoides Menke, 1967. Brazil.

SCAPHEUTES Handlirsch, 1887

brasilianus Handlirsch, 1895. Brazil
flavopictus Smith, 1860. Brazil (as *Pison*)
friburgensis Brèthes, 1913. Brazil
laetus Smith, 1860. Brazil (as *Pison*)
mocsaryi Handlirsch, 1888. Brazil

Printers omissions in "New South American Genera and Species of the Tribe Bothynostethini" (proof not seen by author)

page 94 - Figures 5-6. - Sternite VIII of: 5. Willinkiella argentina, 6. Scapheutes sp.

page 99 - Literature cited -

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printers errors -

page 98 - line 1, read: "to" instead of "too"

line 11, read: "hypostomal" instead of "hypostoma"

line 31, read: "1968" instead of "1967"

line 36 (footnote), read: "No Bothynostethus known to me have a yellow banded abdomen"

page 99 - line 2, read: "1968" instead of "1967"

This paper was published in November, 1968, not 1967 as stated on the cover.