

BICONUS IN PERÚ, WITH NOTICE OF
AN ENDEMIC SPECIES FROM THE COASTAL DESERT
(HYMENOPTERA: ICHNEUMONIDAE).

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INTRODUCTION

Taxonomy and Relationships

Townes (1969:178-9) places *Biconus* in his Subtribe Ischnina (*Ischnus*, *Trachysphyrus* and allied mesostenine genera), where he considers it related to *Chromocryptus*², *Cryptopteryx*, and *Trachysphyrus*. *Biconus*, however, shows some features unapproached or rarely approximated by members of the preceding genera. These characters include absence of tyloids on the male flagellum, medially bituberculate clypeus, profoundly cleft female 4th tarsomere, and tendency for loss or reduction of the brachiella vein. I remain uncertain as to the affinities of *Biconus*. Comparative analysis of mesostenine genera in all parts of the world probably will be necessary to clarify this problem.

COLLECTIONS

Specimens of *Biconus* have been or are to be deposited in the following institutional and personal collections.

CAMBRIDGE. Museum of Comparative Zoology, Harvard University, Cambridge, MA 02138.

GAINESVILLE. Florida State Collection of Arthropods, Bureau of Entomology, Division of Plant Industry, Florida Department of Agriculture and Consumer Services, P. O. Box 1269, 1911 SW 34th Street, Gainesville, FL 32602.

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²Townes' concept of *Chromocryptus* includes the species of *Trachysphyrus* (*sensu* Porter 1967) in which the axillus vein is close to the anal margin of the hind wing.

LAWRENCE. Department of Entomology, Snow Entomological Museum, The University of Kansas, Lawrence, KS 66045.

PORTER. Collection of Charles C. Porter, 301 North 39th Street, McAllen, TX 78501.

TOWNES. American Entomological Institute, c/o Dr. Virendra Gupta, Bureau of Entomology, Division of Plant Industry, Florida Department of Agriculture and Consumer Services, Gainesville, FL 32602.

Genus *BICONUS*

Biconus Townes, 1969. Mem. Amer. Ent. Inst. 12: 178-9.

Type: *Biconus atroruber* Townes.

Fore wing 4.1-10.2mm long. Wings hyaline with dark brown blotches. Female flagellum long and slender, not flattened below apicad. Male flagellum without tyloids. Mandible moderately long with lower tooth almost as long as upper. Clypeus 1.5-2.0 as wide as long, moderately and asymmetrically convex or weakly and symmetrically convex in profile; its apical margin subtruncate to a little convex and usually with a pair of often inconspicuous median preapical tubercles or swellings. Malar space: 0.72-1.0 as long as basal width of mandible. Pronotum with epomia sharp but not prolonged much dorsad or ventrad of scrobe. Mesoscutum with notaulus sharp but fine, reaching more than 0.6 the length of mesoscutum; surface mat with delicate puncto-reticulation and very dense, short setae. Mesopleuron has no ridge on prepectus below. Hind coxa with a strong and polished subvertical groove externo-ventrally near base. Female tarsus with 4th segment very deeply bilobed at apex. Wing venation: areolet large, symmetrically pentagonal, intercubiti gently to moderately convergent dorsad, 2nd abscissa of radius 1.0-1.1 as long as 1st intercubitus; discocubitus broadly angled, ramellus well developed to vestigial; mediella definitely arched; axillus close to and paralleling anal margin of hind wing; brachiella sometimes short or absent. Propodeum with spiracle round to short-oval and with its apical trans-carina represented only by conspicuous ligulo-cuneate, ligulate, ligulo-conic or even conical cristae. First gastric tergite without a baso-lateral expansion; ventral longitudinal carina traceable but often weak or obsolete on postpetiole and sometimes faint also on petiole; dorsal carinae more or less suggested toward apex of petiole and on base of

postpetiole, sometimes absent. Second tergite mat, usually with fine and dense micro-reticulation but lacking discrete punctures and almost without setae, but sometimes with fine and dense short setae that originate in very tiny, inconspicuous punctures. Ovipositor 0.30–0.45 as long as fore wing; straight, moderately slender to rather stout; nodus weak but with a minute notch; ventral valve on tip with sharp, well spaced inclivously oblique ridges.

Biconus occurs at moderate elevations in the Andes of tropical South America from Ecuador to Bolivia. Many species inhabit montane wet forests. They are most often collected by sweeping undergrowth in areas with a flora characterized by tree ferns, a woody arborescent element rich in Myrtaceae and Lauraceae, and by strikingly diverse epiphytic bromeliads and orchids.

Biconus apoecus Porter (n. sp.) is the only species that frequents relatively arid habitats. It is found in semihumid valleys of the west Andean foothills along the Peruvian coast from near Lima north at least as far as Trujillo. These valleys doubtless were much wetter only 10,000 years ago during the most recent glacial maximum and even today support a relict cloud forest vegetation.

KEY TO PERUVIAN SPECIES OF *BICONUS*

1. Flagellum uniformly dark; fore wing with a median and an apical brown area; mesosoma and gaster ferruginous with black on mesoscutum, tegula, and most of scutellum; mesopleuron mostly with delicate and irregular wrinkling; 2nd recurrent 0.7–0.8 as long as 1st abscissa of cubitus; male 1st flagellomere with many but sparse and inconspicuous linear whitish sensilla *B. apoecus* n. sp.
- 1.' Flagellum with a white band; fore wing with a single median brown blotch; mesosoma and gaster brownish yellow to orange; mesopleuron with much sharp, horizontal wrinkling; 2nd recurrent 0.4–0.5 as long as 1st abscissa of cubitus; male 1st flagellomere with prominent and rather crowded linear white sensilla 2. *B. subflavus* n. sp.

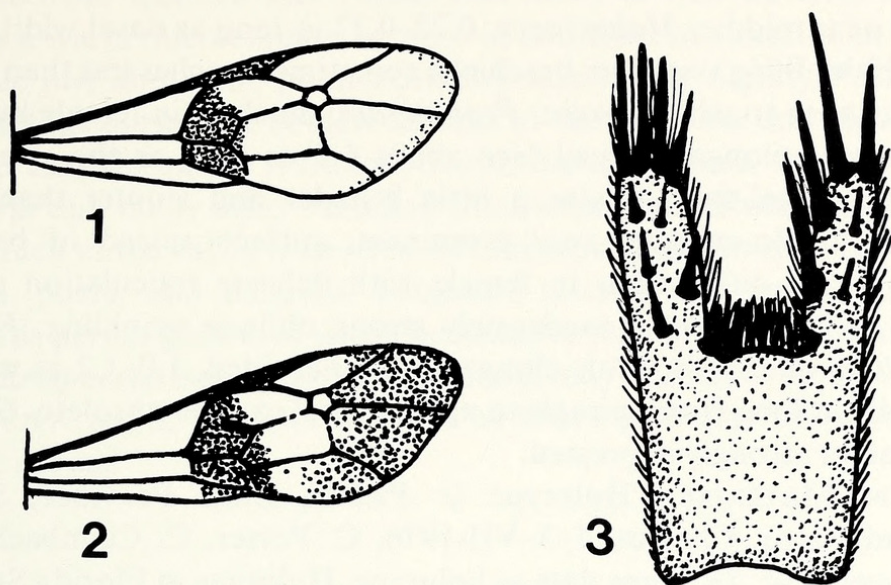
1. *Biconus apoecus* Porter, new species

(Fig. 2, cf. Fig. 4)

FEMALE. *Color*: antenna black with some pale brown on scape; head black; mandible black except for dull brown subapically and

brownish white on dorsal margin; palpi light dusky brown; mesoscutum ferruginous with black on mesoscutum, tegula, and on most of scutellum; gaster ferruginous with weak dusky staining on last tergite; wings hyaline with a broad transverse median band occupying upper hind corner of median cell, basal 0.5 of discocubital cell, 2nd discoidal cell basad of ramellus, 1st brachial cell, base of 2nd brachial cell, and (more faintly) apex of anal cell as well as with a light brownish blotch that covers apical 0.3 of radial cell plus most of 3rd cubital cell, 3rd discoidal cell, and (more faintly) part of apical 0.2 of 2nd brachial cell; coxae ferruginous with blackish staining apicad or sometimes more extensively; trochantelli black with ferruginous staining, especially below; front femur black above and dull ferruginous below; mid femur black with dull ferruginous throughout, or at least in part, dorso-anteriorly; hind femur black with dull ferruginous staining basad, especially above; fore tibia dusky ferruginous; mid and hind tibiae black; tarsi black.

Length of fore wing: 7.8–9.3 mm. *First flagellomere:* 8.0 as long as deep at apex. *Clypeus:* with a pair of weak median preapical tubercles but only slightly convex on apical margin beneath tubercles; lateral margin broad and reflexed. *Malar space:* 0.94–1.0 as long as basal width of mandible. *Mesopleuron:* in large part with delicate and irregular wrinkling. *Wing venation:* radial cell 3.2–3.6 as long as wide; 2nd abscissa of radius 1.0 as long as 1st intercubitus; ramellus inserted at basal 0.4 of discocubitus; bulla of 1st abscissa of cubitus 0.2–0.3 as long as entire vein; 2nd recurrent 0.7–0.8 as long as 1st abscissa of cubitus; brachiella reaches 0.4–0.6 the distance to wing margin. *Propodeum:* rather short and high; basal face steeply declivous, 0.9 as long as the almost vertical apical face; cristae large, stout, conspicuously projecting, broadly ligulate, about 0.3 as long as apical face of propodeum; surface on basal face distad of basal trans-carina with at least some strong and oblique wrinkles laterad but mesad more or less extensively more finely sculptured and on apical face strongly trans-rugose laterad but mesad often less strongly wrinkled or mostly smooth and shining. *First gastric tergite:* postpetiole short and weakly expanded apicad, 1.4–1.7 as wide apically as long from spiracle to apex; ventro-lateral carina traceable throughout, sharp apicad on petiole and on postpetiole; dorso-lateral carina sharp on postpetiole but gradually becoming weaker basad on petiole; dorsal carinae traceable (not sharp) toward apex



Figs. 1-3. *Biconus*. Fig. 1, *Biconus subflavus*. Paratype. Fore wing, showing color pattern. Fig. 2, *Biconus apoecus*. Paratype. Fore wing, showing color pattern. Fig. 3, *Biconus subflavus*. Paratype. Hind tarsomere 4, showing very deep median apical emargination.

of petiole and on base of postpetiole; surface of postpetiole shining with delicate microreticulation that is strongest laterad and fades out toward apex. *Gaster*: stout fusiform. *Ovipositor*: sheathed portion 0.35-0.44 as long as fore wing; tip 0.25-0.32 as high at notch as long from notch to apex.

MALE. differs from female as follows: *Color*: scape brownish white below and laterally; mandible more broadly pale brown to whitish; palpi dull white; tegula partly reddish; front femur ferruginous with dusky staining above; mid femur extensively ferruginous with irregular dusky staining below and apico-dorsally; hind femur ferruginous on much of basal 0.3 (especially above) and mostly black apically.

Length of fore wing: 9.8-10.2 mm. *First flagellomere*: 5.5-5.7 as long as deep at apex; on apical 0.6 with numerous but inconspicuous and well separated whitish linear sensilla. *Clypeus*: median preapical tubercles stronger than in female; apical margin gently

bisinate beneath tubercles; profile weakly convex with highest point near middle. *Malar space*: 0.72–0.77 as long as basal width of mandible. *Wing venation*: brachiella sometimes reaches less than 0.5 the distance to wing margin. *Propodeum*: much as in female but a little more elongate: basal face about 1.2 as long as the steeply sloping apical face; cristae a little broader and stouter than in female, ligulo-cuneate, very prominent; surface apicad of basal trans-carina duller than in female with delicate reticulation and more or less extensive moderately strong oblique wrinkling. *First gastric tergite*: postpetiole elongate, parallel-sided, 1.0–1.2 as wide apically as long from spiracle to apex; dorsal carinae obsolete. *Gaster*: rather strongly depressed.

TYPE MATERIAL. Holotype ♀: PERÚ, Lima Province, San Gerónimo, nr. Chosica, 1–5–VII-1976, C. Porter, C. Calmbacher. Paratypes: 5♀, 2♂, same date as holotype. Holotype in Florida State Collection of Arthropods. Paratypes in Florida State Collection of Arthropods (1♀, 1♂), Collection of Henry K. Townes (1♀), Museum of Comparative Zoology (1♀), University of Kansas Collection (1♀), Collection of Charles C. Porter (1♀, 1♂).

RELATIONSHIPS. This species appears closely related to the Ecuadorian *Biconus atroruber* (Townes 1969:178–79), with which it agrees in being ferruginous with black markings and in having a median and an apical dark area on the fore wing. It differs from *B. atroruber* by its entirely dark (instead of white banded) flagellum; in having the mesosomatic black markings restricted to the mesoscutum, tegula, and scutellum (instead of extending also onto the pronotum, subalarum, mesosternum, upper metapleuron, and propodeum); in its mostly ferruginous (instead of mostly black) coxae; by its strongly (instead of finely) wrinkled apical propodeal face; and in having the female propodeal cristae ligulate (instead of subconic and decurved slightly at apex) and the male cristae ligulo-cuneate (instead of high and cone-like).

Biconus apoecus may be distinguished from the central Peruvian *B. subflavus* Porter by characters given in the key, as well as by its shorter first flagellomere, more weakly tuberculate and apically less convex clypeus, longer female malar space, shorter and higher propodeum, and less definitely micro-reticulate postpetiole.

FIELD NOTES. San Gerónimo, Perú, the type locality, is on the lower west Andean slopes in the valley of the Santa Eulalia River

not far from Chosica and Lima. The valley is well watered and enjoys a warm microclimate because of its sheltered situation at an altitude just above the point normally reached by nightly Pacific coastal fogs during the coolest months of the year. Natural vegetation at San Gerónimo includes *Acacia*, *Salix*, *Schinus*, *Baccharis*, *Tessaria* and many other Andean, Chaqueñan, and Holarctic genera. Much of the valley is covered by orchards of chirimoyas, citrus, apples, pears, and bananas. Irrigation ditches that traverse the orchards permit growth of a lush herbaceous understory from which *Biconus apoecus* and other ichneumonids may be swept.

SPECIFIC NAME. From the Greek adjective *apoecus*, "away from home, abroad".

2. *Biconus subflavus* Porter, new species (Fig. 1, 3).

FEMALE. *Color:* antenna black with some dark brown on scape and with a white annulus (extensively brown to black stained below) on flagellomeres 3 (near apex) or 4–9 or 10 (basally); head black with dark brown on clypeus and lighter brown on mandibular condyle; mandible blackish with much brown to pale brown, especially subapical and dorsad; palpi dull white; mesosoma pale brownish yellow, a little darker and more orangish dorsally; gaster pale brownish to orangish yellow; wings hyaline with a single brown blotch that covers basal 0.4 of discocubital cell, extends a little into base of 2nd discoidal cell, and reaches below across most of 1st brachial cell; legs pale brownish yellow with some darker staining, especially on apices of trochantelli and bases of femora, as well as with 4th and 5th tarsomeres largely dark brown.

Length of fore wing: 8.1–10.1 mm. *First flagellomere:* 9.3–9.7 as long as deep at apex. *Clypeus:* with a pair of broad but weak median subapical swellings, apical margin moderately convex medially beneath swellings, lateral margin not reflexed. *Malar space:* 0.80–0.87 as long as basal width of mandible. *Mesopleuron:* largely with fine but sharp horizontally biased wrinkling. *Lower metapleuron:* with strong, obliquely biased wrinkling. *Wing venation:* radial cell 3.4–4.1 as long as wide; 2nd abscissa of radius 1.0–1.1 as long as 1st intercubitus; ramellus inserted near basal 0.3 of discocubitus;

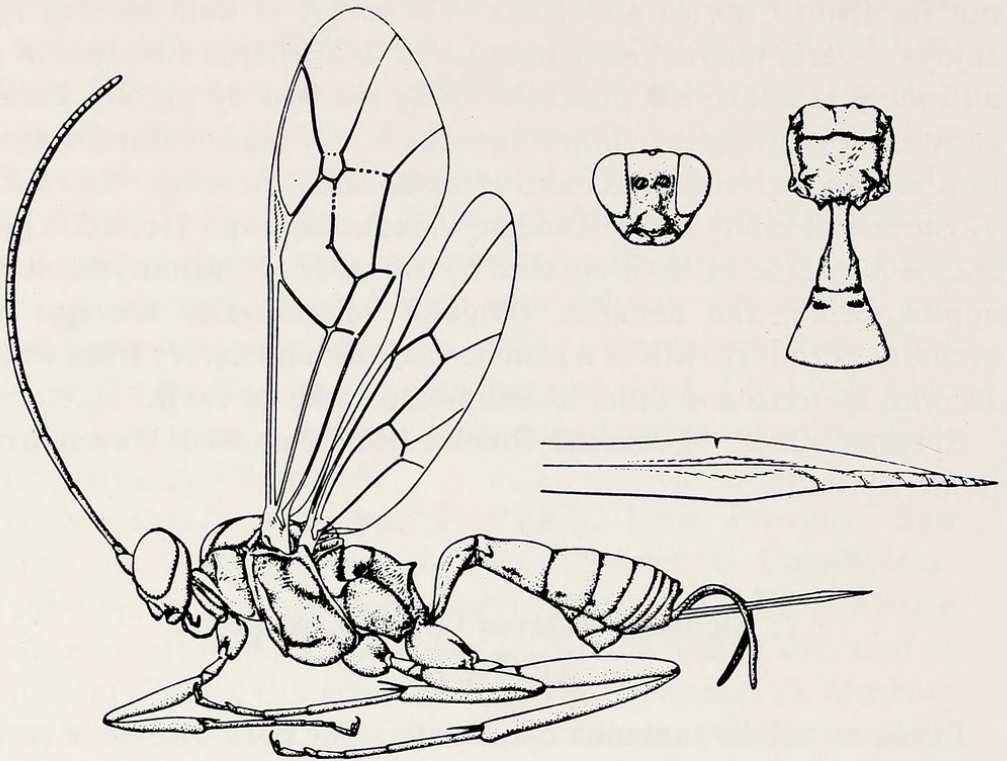


Fig. 4. *Biconus atroruber*. Female in lateral view, head in anterior view, propodeum and first 2 gastric tergites in dorsal view, and ovipositor tip in lateral view. (From Townes, 1969:431).

bullae of 1st abscissa of cubitus 0.1–0.2 as long as entire vein; 2nd recurrent 0.4–0.5 as long as 1st abscissa of cubitus; brachiella reaches 0.4 or less the distance to wing margin (sometimes almost absent). *Propodeum*: moderately elongate; basal face gently declivous, 0.70–0.85 as long as the almost vertical apical face; cristae stout, conspicuously projecting, conico-ligulate; surface on basal face distad of basal trans-carina mat with uniformly strong reticulate wrinkling and on apical face with even stronger wrinkling. *First gastric tergite*: postpetiole short but rather strongly expanded apicad, 1.3–1.5 as wide apically as long from spiracle to apex; ventral longitudinal carina sometimes obsolete on petiole; dorsal carinae weakly suggested above spiracles; surface of postpetiole strongly shining with faint microreticulation. *Gaster*: moderately elongate fusiform. *Ovipositor*: sheathed portion 0.35–0.41 as long as

fore wing; tip 0.23–0.26 as high at notch as long from notch to apex.

MALE. differs from female as follows: *Color*: white flagellar annulus reaches from apex of 8th to base of 13th segment.

Length of fore wing: 9.6 mm. *First flagellomere*: 6.0 as long as deep at apex; except near base with numerous and prominent, rather crowded, linear white sensilla. *Clypeus*: tubercles more distinct and apical margin more strongly convex than in female; profile rather strongly convex with highest point a little distad of middle. *Malar space*: 0.82 as long as basal width of mandible. *Wing venation*: radial cell 3.1 as long as wide; brachiella absent. *Propodeum*: basal face long but more strongly declivous than in female, 0.85 as long as the almost vertical apical face; cristae a little stouter and more conical than in female; surface distad of basal trans-carina more coarsely and regularly wrinkled than in female. *First gastric tergite*: postpetiole slender and parallel-sided, 0.91 as wide apically as long from spiracle to apex. *Gaster*: cylindric, not depressed.

TYPE MATERIAL. Holotype ♀: PERÚ, Cuzco Province, Machu Picchu, 1900 m, 4–19–IX-1964, C. Porter. Paratypes: 2♀, 1♂, same data as holotype. Holotype in Florida State Collection of Arthropods. Paratypes in Florida State Collection of Arthropods (1♀, 1♂), and Collection of Charles C. Porter (1♀).

RELATIONSHIPS. As indicated previously, this species differs substantially in many points of color and structure from the other described *Biconus*. It may be recognized at a glance by its orangish ground color and unifasciate fore wing.

FIELD NOTES. The type locality is in cool tropical cloud forest. Specimens of *Biconus subflavus* were swept from lush undergrowth at the forest edge along the railway tracks which parallel the Urubamba River.

SPECIFIC NAME. From the Latin adjective *subflavus*, “somewhat yellow”.

ACKNOWLEDGMENTS

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SUMMARY

Biconus is a "trachysphyroid" mesostenine found in Andean wet forests and in the Coastal Desert of Perú. It is recognizable by its brown blotched wings; lack of tyloids on male flagellum; mat mesoscutum; arched mediella; anally situate axillus; sharply grooved hind coxal base; deeply cleft female 4th tarsomere; nearly round propodeal spiracle; unarmed petiolar base; and subligulate to conical, prominent (but never spiniform) propodeal cristae. There are 3 species: *B. atroruber* Townes from Ecuador (white band on flagellum, body ferruginous and black, fore wing with 2 brown areas); *B. apoecus* n. sp. from the Peruvian Coastal Desert (similar to *B. atroruber* but without a white flagellar band); and *B. subflavus* from Peruvian montane forest (mesosoma and gaster orangish, fore wing with 1 brown blotch).

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