Revision of the Nearctic species of *Baryconus* (Hymenoptera: Scelionidae, Scelioninae)

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Received July 5, 1981

RITCHIE, A. J., and L. MASNER. 1983. Revision of the Nearctic species of *Baryconus* (Hymenoptera: Scelionidae, Scelioninae). *Can. J. Zool.* **61**: 704–720.

The genus *Baryconus* Foerster (= *Hoploteleia* Ashmead) (Scelionidae, Scelioninae) in North America is revised. A generic diagnosis and a key to species are given; the nomenclature and biology of *Baryconus* are discussed. Eight species are recognized in North America, six of them new to science: *Baryconus albohirtus* (United States), *B. americanus* (Canada, United States), *B. bidentatus* (United States), *B. clypeatus* (United States, Mexico), *B. minutus* (United States), and *B. unidentatus* (United States). The two previously known species, viz. *B. floridanus* Ashmead and *B. noveboracensis* (Brues), are redescribed, females being described for the first time. Biological and distributional notes on each species are included.

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Nous révisons les espèces néarctiques du genre *Baryconus* Foerster (= *Hoploteleia* Ashmead) (Scelionidae, Scelioninae). Nous donnons une diagnose du genre et une clé dichotomique des espèces et discutons de la nomenclature et de la biologie des *Baryconus*. Des huit espèces néarctiques, six sont décrites pour la première fois: *Baryconus albohirtus* (États Unis), *B. americanus* (Canada, États Unis), *B. bidentatus* (États Unis), *B. clypeatus* (États Unis, Mexique), *B. minutus* (États Unis), et *B. unidentatus* (États Unis). Nous redécrivons les males de *B. floridanus* Ashmead et de *B. noveboracensis* (Brues), et décrivons pour la première fois les femelles de ces espèces. Nous incluons des notes sur la biologie et l'aire géographique de chaque espèce.

Nomenclature, relationships, and biology

The name *Baryconus* was proposed by Foerster (1856) without an included species. Ashmead (1887) described the first species, *B. floridanus*, but interpreted *Baryconus* in a different sense than did Foerster (1856). Ashmead (1893) apparently recognized the two different interpretations of *Baryconus* as he erected *Hoploteleia* for *B. floridanus*, thereby creating a longstanding nomenclatorial problem. Consequently, most species of *Baryconus* were originally described as members of *Hoploteleia*. Foerster's (1856) concept of *Baryconus* was correctly recognized by Kieffer (1926) when he described *B. rufipes* from Foerster's collection (now in Vienna, examined by the junior author in 1968). Szabo (1962, 1969, 1971) recognized *Baryconus* sensu Foerster as a genus distinct from *Hoploteleia* Ashmead, with *B. rufipes* Kieffer as the type-species. However, *B. rufipes* Kieffer cannot be regarded the type-species of *Baryconus* as it was not the first subsequently included species. *Baryconus rufipes* Kieffer is now placed in *Probaryconus* Kieffer (= *Baryconus* sensu Foerster) (Masner 1976). Muesebeck and Walkley (1956) recognized *B. floridanus* as the type-species of

Baryconus by application of Article 69.A.ii.2 of the International Code of Zoological Nomenclature (type-species by subsequent monotypy; see Carlson (1979, p. 317) for a discussion of Foerster's genera of Ichneumonidae without included species). Muesebeck and Walkley (1956) also regarded *Hoploteleia* Ashmead a junior synonym of *Baryconus* because of isogenotypy. We prefer to follow Muesebeck and Walkley (1956) in an effort to stabilise the synonymy.

The transfer of species from *Hoploteleia* to *Baryconus* has been sporadic. The two previously known Nearctic species of *Baryconus*, viz. *B. floridanus* Ashmead and *B. noveboracensis* (Brues), were respectively transferred by Muesebeck and Walkley (1956) and Muesebeck (1979). The only revisions of *Baryconus* (= *Hoploteleia*) are by Kieffer (1926, world species) and Dodd (1929, Australian species).

Baryconus belongs to the tribe Baryconini (Scelioninae). The other genera in the tribe are *Apegus* Foerster, *Bracalba* Dodd, *Oxyscelio* Kieffer, and *Chromoteleia* Ashmead (Masner 1976). *Baryconus* is the only member of the tribe in North America. The closest relative to *Baryconus* is *Apegus*, with species in the Palearctic and Oriental regions. Members of *Baryconus*

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can be distinguished from those of *Apegus* primarily by the completely margined frontal depression as well as tergite 7 being armed in males. Most species of *Baryconus* have a median carina or groove between the notauli, and a sharply angular region of the vertex-occiput. Members of *Apegus* have the frontal depression incompletely margined, lack a median groove or carina, and have the junction of the vertex and occiput rounded (Masner 1976).

The genus *Baryconus* contains about 60 described species, with members occurring in all main geographic regions (Masner 1976). It is centered in the tropics of both the Old and New Worlds, with only a few species penetrating into the temperate zones of both the Northern and Southern hemispheres. However, only a small number of the extant species appear to have been described, with the tropical fauna largely unexplored. Thus, it is extremely difficult to determine the phylogenetic relationships within the Nearctic species until the world fauna has been adequately studied. The eight species in North America are unequally divided into two species groups. Seven species, viz. *albohirtus*, *americanus*, *bidentatus*, *floridanus*, *minutus*, *noveboracensis*, and *unidentatus*, belong to a group exemplified best by *B. floridanus* (present designation). This group is primarily characterized by a truncate clypeus, costate genae, a vertex either shagreened and rugulose or rugulose, and nonspecialized middle and hind basitarsi. Members of this group appear in all zoogeographic regions. *Baryconus clypeatus* is the only North American representative of an otherwise strictly Neotropical species group exemplified best by *B. erythrothorax* (Kieffer) (present designation). Members of this species-group have the clypeus pointed ventrally, noncostate genae, the vertex shagreened but not rugulose, and, especially in males, the middle and hind basitarsi compressed laterally. This group contains several undescribed Neotropical species which usually have a bright red mesosoma and more or less iridescent green eyes.

Little is known about the biology of the Baryconini; it appears that members of this tribe parasitize the eggs of arboreal Orthoptera such as the katydids. Bin (1976) reared three species of *Baryconus* in Europe from the eggs of *Phaneroptera* spp. (Tettigoniidae, Phaneropterinae). Only one Nearctic species has been reared; this is *B. clypeatus*, reared from unidentified katydid eggs in Arizona (by V. D. Roth) and in Mexico (by N. L. H. Krauss). The latter two records are new to science. Masner (unpublished) has observed *Baryconus* spp. moving rapidly on the upper foliage of trees and shrubs in Hispaniola (Dominican Republic). This behavior may account for the relative abundance of members of *Baryconus* in Malaise traps. Consequently, individuals

of *Baryconus* are seldom caught in pan traps or anywhere near the ground.

Morphology

The species of *Baryconus* exhibit sexual dimorphism in several characters. The most consistent dimorphic characters are the antennae (clubbed in females, filiform in males), the number of external metasomal tergites (6 in females, 7 in males), and the posterolateral modification of the terminal metasomal tergite. The relative length of the forewings (i.e., whether they cover the tip of the metasoma) is also usually dimorphic.

The most important characters in *Baryconus* are located on the head and metasoma; in particular, the condition of the mandibles and terminal metasomal tergite are the most useful in the determination of the Nearctic species. The mandibles vary considerably within several species (e.g., from long and sharp to short and blunt), presumably an effect of abrasion; minor differences should not be construed as a specific difference. This is particularly true for *B. unidentatus* in which some individuals have a small upper tooth and others do not. Also, the bidentate mandibles of *B. bidentatus* may appear to have a minute median tooth (Fig. 7); the latter is a flat lobe on the upper tooth and is not a true tooth.

Morphological terms, definitions, and abbreviations are those given by Masner (1976). One additional structure, not described by Masner (1976), is the interocellar sculpture; this is a distinct set of striae that run between the anterior ocellus and each posterior ocellus along the lateral ocellar line. Body measurements are usually in terms of maximal dimension (e.g., maximum width); exceptions are tergite lengths (measured along middorsal length) and the lateral, posterior, and ocular ocellar lines (measured in terms of the maximal diameter of a posterior ocellus, *D*). Spikes on the last metasomal tergite are measured from the tip of the spike to the anterior margin of the tergite, as it is often difficult to determine the exact base of the spike.

List of abbreviations

A1, A2, A3, etc., antennal segments (A1 = scape, A2 = pedicel, A3 = first flagellar segment, etc.); *D*, diameter of a posterior ocellus; LOL, lateral ocellar line (distance between the anterior ocellus and a posterior ocellus); OOL, ocular ocellar line (shortest distance between a posterior ocellus and the inner orbit of an eye); POL, posterior ocellar line (distance between posterior ocelli); T1, T2, T3, etc., tergites of the metasoma.

List of museums containing material examined

Current curators are given in parentheses. AEI,

American Entomological Institute, Ann Arbor, MI (H. K. Townes); AMNH, American Museum of Natural History, New York, NY (J. G. Rosen); CAS, California Academy of Sciences, Golden Gate Park, San Francisco, CA (P. H. Arnaud); CNC, Canadian National Collection of Insects, Arachnids, and Nematodes, Biosystematics Research Institute, Ottawa, Ontario (L. Masner); CDA, California Department of Food and Agriculture, Sacramento, CA (M. Wasbauer); FSCA, Florida State Collection of Arthropods, Gainesville, FL (L. Stange); INHS, Illinois Natural History Survey, Champagne, IL (W. LaBerge); LACM, Los Angeles County Museum of Natural History, Los Angeles, CA (R. R. Snelling); MCZ, Museum of

Comparative Zoology, Harvard University, Cambridge, MA (R. McGinley); MPM, Milwaukee Public Museum, Milwaukee, WI (G. Noonan); MSU, Michigan State University, East Lansing, MI (R. L. Fischer); NYCF, State University of New York, College of Environmental Science and Forestry, Syracuse, NY (F. Kurczewski); TAM, Texas A&M University, College Station, TX (R. Wharton); UCA, University of California, Albany, CA (K. S. Hagen); UCD, University of California, Davis, CA (R. O. Schuster); UCR, University of California, Riverside, CA (J. Hall); UGA, University of Georgia, Athens, GA (C. Smith); USNM, United States National Museum of Natural History, Washington, DC (P. Marsh).

Key to the Nearctic species of *Baryconus*

Females (antennae clubbed, metasoma with 6 tergites; female *B. albohirtus* unknown)

1. T6 armed with either distinct spikes (Figs. 22, 24) or with minute points (Fig. 27) 2
- 1'. T6 unarmed (Figs. 23, 25, 26, 28) 4
2. Clypeus triangular, with ventral margin produced into point (Fig. 6); vertex and gena with shallow, irregular punctations; genae without costae; posterior ocelli contiguous with inner orbit of eye; Arizona, Texas, Mexico *clypeatus* n. sp.
- 2'. Clypeus truncate, with ventral margin straight or only slightly convex; vertex and gena costate or rugo-reticulate; posterior ocelli separate from inner orbit of eye 3
3. T6 triangular, with two minute spikes before apex (Fig. 27); hind margin of scutellum shining smooth medially (Fig. 15); forewings reaching only to base of T5; eastern and southern United States and Texas *noveboracensis* (Brues)
- 3'. T6 transverse, with two distinct spikes (Fig. 22); hind margin of scutellum entirely shagreened (Fig. 14); forewings extending past tip of metasoma; eastern Canada, eastern, southern, and midwestern United States, Arizona *americanus* n. sp.
4. Mandibles almost unidentate, with upper tooth minute or missing; anterolateral corners of clypeus produced into rounded lobes (Fig. 11); Texas *unidentatus* n. sp.
- 4'. Mandibles bidentate, subtridentate, or tridentate, with lateral teeth equal; anterolateral corners of clypeus not produced, 5
5. Metanotum medially with only a small rounded lobe (Fig. 19); smaller individuals, under 3 mm in length; California *minutus* n. sp.
- 5'. Metanotum medially with two sharp points; larger individuals, over 3 mm, 6
6. Mandibles bidentate, sometimes with small flattened median lobe from upper tooth (Figs. 5, 7); clypeus distinctly wider than toruli (Fig. 5); temples behind eyes slightly bulging; eastern, southern, and midwestern United States *bidentatus* n. sp.
- 6'. Mandibles subtridentate, with median tooth subequal to lateral teeth; clypeus narrower than, or equal to toruli (Fig. 8); temples behind eyes receding; Ontario, eastern, southern and midwestern United States *floridanus* Ashmead

Males (antennae filiform, metasoma with 7 tergites; male of *B. unidentatus* unknown)

1. Spikes on T7 distinct (Figs. 29–32, 34); metanotum medially with two distinct points (Figs. 12–17, 20, 21) 2
- 1'. Spikes on posterolateral corners of T7 indistinct (Figs. 3, 33); metanotum medially with small rounded lobe (Fig. 19); California, Arizona 6
2. Clypeus triangular, with ventral margin produced into point (Fig. 6); posterior ocelli contiguous with the inner orbit of eye; vertex and gena with shallow, irregular punctations, without costae (Fig. 6); Arizona, Texas, Mexico *clypeatus* n. sp.
- 2'. Clypeus truncate, with ventral margin straight or only slightly convex; posterior ocelli well separated from inner orbit of eye; vertex and gena costate or rugoreticulate 3
3. Mandibles bidentate, sometimes with a small median small lobe from upper tooth (Fig. 7); clypeus distinctly wider than toruli (Fig. 5); temples behind eyes slightly bulging (dorsal view); eastern, southern, and midwestern United States *bidentatus* n. sp.

- 3'. Mandibles subtridentate or tridentate; clypeus narrower than toruli; temples behind eyes receding (dorsal view)...4
4. T6 three times as wide as long (Fig. 34); fore wings not reaching T7; anterior margin of T1 usually shagreened; eastern and southern United States. *noveboracensis* (Brues)
- 4'. T6 at least 3.5 times as wide as long; forewings reaching past tip of abdomen; anterior margin of T1 smooth.....5
5. Hind margin of scutellum shagreened (Fig. 14); posterior part of vertex medially depressed; eastern Canada, eastern, southern, and midwestern United States, Arizona.....*americanus* n. sp.
- 5'. Hind margin of scutellum smooth (Fig. 15); posterior part of vertex not depressed; Ontario, eastern, midwestern and southern United States. *floridanus* Ashmead
6. Erect bristles on submarginalis, microtrichiae on wing and pubescence on abdomen white; posterior part of mesoscutum between notauli coriaceous; median groove absent (Fig. 2). *albohirtus* n. sp.
- 6'. Erect bristles on submarginalis, microtrichiae on wing and pubescence on abdomen dark; posterior part of mesoscutum between notauli rugose; median groove represented anteriorly by a line of irregular confluent punctures (Fig. 18). *minutus* n. sp.

Baryconus Foerster

Baryconus Foerster, 1856. Hymenopterologische Studien. Vol. II. pp. 101, 104; Ashmead 1887. Entomol. Am. 3: 118. First included species.

TYPE-SPECIES: *Baryconus floridanus* Ashmead, 1887. Entomol. Am. 3: 118. Subsequent monotypy; first included species.

Hoploleleia Ashmead, 1893. U.S. Natl. Mus., Bull. No. 45. pp. 210, 211, 214; *fide* Muesebeck and Walkley, 1956. Proc. U.S. Natl. Mus. 105: 32.

TYPE-SPECIES: *Baryconus floridanus* Ashmead. Original designation.

Rhacoteleia Cameron, 1905. Spolia Zeylan. 3: 72; *fide* Masner, 1965. Bull. Br. Mus. (Nat. Hist.), Suppl. No. 1, pp. 68–69.

TYPE-SPECIES: *Rhacoteleia pilosa* Cameron. Monotypic.

Trichanteris Kieffer, 1910. in Wytsman, Genera Insectorum, Fasc. 80B, p. 88; *fide* Masner, 1976. Mem. Entomol. Soc. Can. 97: 21.

TYPE-SPECIES: *Trichanteris foveatifrons* Kieffer. Monotypic.

Apegusoneura Cameron, 1912. Soc. Entomol. 27: 15, 69; *fide* Dodd, 1919. Trans. Entomol. Soc. London, 1919, Parts III and IV, p. 338.

TYPE-SPECIES: *Apegusoneura striolatus* Cameron. Designated by Muesebeck and Walkley, 1956. Proc. U.S. Natl. Mus. 105: 32.

Ivondrella Risbec, 1956. Rev. Fr. Entomol. 23: 257; *fide* Masner, 1976. Mem. Entomol. Soc. Can. 97: 21.

TYPE-SPECIES: *Ivondrella seyrigi* Risbec. Monotypic.

DESCRIPTION: Generally elongate but robust forms, ranging in body length from 2.5 to 5.5 mm, with predominantly rough sculpturing; head in dorsal view transverse, subrectangular; frontal depression deep, concave, margined completely with strong keel; clypeus in most species transverse, subrectangular, with anterolateral corners only rarely prominent, in some species with lower margin pointed; mandibles short and strong, tridentate or subtridentate, rarely bidentate or

unidentate; palpal formula 4–2; eyes large, glabrous; posterior ocelli close to or contiguous with inner orbits of eyes; vertex in most species rather flattened, whereby both frons and particularly occiput slope down abruptly; occipital carina in most species strong, complete; antennal formula 12–12, antenna with moderate clava in females, with A5 as sex segment in males; mesoscutum with complete notauli, in most species with complete median groove or carina; skaphion not developed; netrion well developed; mesopleural depression moderate; metanotum medially armed, bispinose in most species, rarely with one small protuberance; propodeum not armed; forewings with venal formula: marginalis < stigmalis < postmarginalis; stigmal vein almost perpendicular to marginal vein, with submarginal vein considerably remote from foremargin of wing yet not particularly curved; trichia on submarginal vein usually dark; hind wing with complete submarginal vein reaching hamuli; tibial spur formula 1–1–1; tarsal formula 5–5–5; metasoma elongate, rather depressed dorsoventrally, with first three segments largest; females with 6 visible tergites and 6 sternites, T1 not humped, T6 in some species armed with spikes or points, T7 not differentiated, not extruded with ovipositor; males with 7 visible tergites and sternites, T7 almost always with spikes or points postero-laterally.

DIAGNOSIS: The Nearctic species of *Baryconus* are easily separated from all other Nearctic scelionids by the completely margined frontal depression. Other important diagnostic characters for *Baryconus* include the angular junction of the vertex and occiput and, in males, the posterolateral spikes or other modification of T7.

Baryconus albohirtus n. sp.

Figs. 1, 2, 3

MALE: Holotype: Length 2.4 mm. Black; base of scape, distal half of pedicel, trochanters, apical and distal ends of femora and tibiae, apical segments of tarsi amber; remainder of femora and tibiae, distal segment of tarsi, basal half of pedicel brown; scape dark brown. Mandible tridentate, median tooth subequal to lateral

FIGS. 1–3. *Baryconus albohirtus* n. sp., ♂ (Holotype). Fig. 1. Head and mouthparts, anterior view, SEM. Fig. 2. Thorax, dorsal view, SEM. Fig. 3. Male T6 and T7, dorsal view, SEM. (Female *B. albohirtus* unknown.)

teeth; clypeus truncate, 0.11 mm wide, 0.04 mm high, narrower than toruli; frontal depression with distinct transverse rugosity; frons and gena moderately costate (Fig. 1). Temples (dorsal view) narrowed behind eyes. Vertex moderately shagreened, irregularly rugulose; occipital carina strong, complete; OOL = $0.6D$, POL = $3.0D$, LOL = $1.6D$; intercellular sculpture present, weak. Antennomere lengths (A1–A12, in millimetres): 0.33, 0.09, 0.11, 0.10, 0.10, 0.10, 0.10, 0.10, 0.10, 0.10, 0.10, 0.15. Mesoscutum flattened, weakly coriaceous; notauli complete, moderately weak; median groove absent (Fig. 2). Scutellum smooth except for deep punctations near margin; metanotal armature reduced to a small rounded lobe. Forewings 1.7 mm long, just reaching tip of metasoma; bristles on submarginalis, microtrichia on wing white; hind wing 1.2 mm long. Metasoma 1.22 mm long; tergite lengths (T1–T7, in millimetres): 0.17, 0.22, 0.33, 0.21, 0.16,

0.10, 0.03; spikes on T7 minute, 0.04 long, 0.14 wide (Fig. 3).

FEMALE: Unknown.

TYPE MATERIAL: Holotype: ♂ (CNC No. 17232), 7 mi E. Douglas, AZ, September 15, 1978, G. Gordh and party.

REMARKS: This species can be readily distinguished from all other species of *Baryconus* by the white bristles and microtrichia on the forewing. Other distinguishing characters include the unidentate metanotal armature, flattened mesoscutum, the absence of the mesoscutal median groove, and the very poorly developed spikes on T7. The unidentate metanotal armature and the poorly developed spikes on T7 appear to ally *B. albohirtus* with *B. minutus*; the two species can be distinguished by the color of the bristles on the submarginalis (dark in *B. minutus*) and by the absence of the median groove in *B. albohirtus*. Nothing is known about the biology of this

species. The name *albohirtus* refers to the white bristles, microtrichiae, and pubescence.

***Baryconus americanus* n. sp.**

Figs. 4, 12, 14, 22, 29, 35

FEMALE: Holotype. Length 3.01 mm. Black; apical half of mandible brown; A1, venter of A2, distal half of A3 dark amber; venter of A4–A7, legs beyond coxae, yellow; dorsum A2–A7, A8–A12 piceous brown. Mandibles subtridentate; clypeus truncate, 0.14 mm wide, 0.04 mm long, narrower than toruli; frons and gena (except malar region) rugo-reticulate (Fig. 4). Temples (dorsal view) narrowed behind eyes. Vertex strongly shagreened, strongly rugo-reticulate, postero-medially depressed; OOL = 0.5D, POL = 1.4D, LOL = 0.7D; interocellar sculpture moderately strong; occipital carina strong, complete. Antennomere lengths (A1–A12, in millimetres): 0.57, 0.11, 0.12, 0.12, 0.12, 0.09, 0.09, 0.11, 0.11, 0.10, 0.10, 0.12. Mesoscutum slightly rounded; median groove deep, wide, stronger than notauli; notauli strong, moderately wider and deeper posteriorly (Fig. 12). Scutellum strongly rugoreticulate, hind margin shagreened; metanotal armature well developed, bidentate, shagreened (Fig. 14). Forewing 2.37 mm long, reaching past tip of metasoma; hind wing 1.68 mm long. Metasoma 1.50 mm long; tergite lengths (T1–T6, in millimetres): 0.21, 0.32, 0.46, 0.25, 0.16, 0.10; T6 transverse, with distinct spikes on postero-lateral corners (Fig. 22).

MALE: Allotype differs from holotype as follows: length 3.07 mm; A3–A12 dark brown; antennomere lengths (A1–A12, in millimetres): 0.44, 0.09, 0.13, 0.13, 0.12, 0.12, 0.12, 0.13, 0.12, 0.12, 0.12, 0.12, 0.17; OOL = 0.6D, POL = 1.7D, LOL = 1.0D; metasoma 1.5 mm long; tergite lengths (T1–T7, in millimetres): 0.22, 0.32, 0.42, 0.23, 0.15, 0.09, 0.07; width of T6 3.5 times length (Fig. 29); T7 spikes distinct. Genitalia as in Fig. 35.

VARIABILITY: Body length ranges from 3.0 to 3.5 mm long; most specimens are 3.1–3.2 mm long, while specimens from Arizona tend to be larger. Specimens from Texas tend to be dark brown, with A8–A12 and the venter of A2–A7 entirely yellow; also, these specimens have the mesoscutum quite flattened. Southern specimens have relatively wider metasoma. Some specimens have the femora and A1 darker. One specimen (♀ paratype from Aldershot, N.S.) has the notauli very strong. A specimen from Michigan has the frons and gena strongly costate (as opposed to rugoreticulate) and is very opaque (opposed to shining); for this reason it has been excluded from the type series.

TYPE MATERIAL: Holotype, ♀ (CNC No. 17233), Hamilton, Ont., 19–28.VIII.1980, Malaise trap, M. Sanborne; Allotype, ♂ (CNC), with same data as holotype but collected

16.IX.1980. Paratypes (153 ♂♂, 13 ♂♂). *Arizona:* 7 ♂♂ (CDA), Southwestern Research Station, 5 mi W Portal, Chiricahua Mountains, Cochise Co., 8–17.VIII.1978, Malaise trap, M. Washbauer. *Florida:* 1 ♀ (FSC), 3 mi W Lake Carr, Santa Rosa Co., 19.VI.1974, H. V. Weems, Jr. and C. R. Artaud; 1 ♀ (AMNH), Monticello, 4–8.X.1944. *Georgia:* 1 ♀, 1 ♂ (CNC), Forsyth, 1.IX–8.X.1970, Malaise trap, F. T. Naumann. *Indiana:* 1 ♀ (USNM), Mineral Springs, 1.IX.26. *Kentucky:* 1 ♀ (CNC), Blue Ridge Parkway, Rock Castle Gorge Overlook, Mile 170, 975 m, 22.IX.1980, Masner and Bowen. *Maryland:* 1 ♀ (AEI), Bowie Co., 14.X.1975, H. and M. Townes. 1 ♀ (UCD), Colesville, Montgomery Co., 30.VIII.1976, A. S. Menke; 1 ♀ (USNM), College Park, 13.VIII.1914; 1 ♀ (USNM), Plummers Island, 24.IX.1959, K. V. Krombein; *Massachusetts:* 2 ♀♀ (MCZ), Bedford, 13–16.IX.1967, H. E. Evans; 3 ♀♀ (MCZ), Bedford, 1–20.IX.1968, Malaise trap, H. E. Evans; 2 ♀♀ (MCZ), Bolton, 25.IX.1971, H. E. Evans; 8 ♀♀, 2 ♂♂ (MCZ), Holliston, 5.VIII–11.IX.1971, N. Banks; 2 ♀♀ (CNC), Bird Sanctuary, Wellfleet, 9.IX.1970, L. Masner. *Michigan:* 1 ♀ (USNM), Benzie Co., 2–4.IX.1967, R. W. Carlsson; 1 ♀ (MSU), Benzie Co., 30–31.VIII.1968, R. W. Carlsson; 2 ♀♀ (USNM), Midland Co., 21–22.VIII.1942, R. R. Dreisbach; 2 ♀♀ (USNM), Midland Co., 15–20.VIII.1944, R. R. Dreisbach; 1 ♀ (USNM), Ogemaw Co., 1946, R. R. Dreisbach. *New Brunswick:* 6 ♀♀ (CNC), Kouchibouguac National Park, 3.VIII–20.IX.1977, S. J. Miller. *New York:* 2 ♀♀ (AMNH), Cherrytown, 4 mi NNW Kerhonkson, Ulster Co., 19.VIII–12.IX.1971, P. and B. Wygodzinsky; 7 ♀♀, 1 ♂ (AMNH), Kalbfleisch Field Station, Huntington, 16.VIII–7.IX.1962, Malaise trap, P. H. Arnaud; 1 ♀ (NYCF), Lakeview Game Area, Jefferson Co., 5.IX.1971, R. C. Miller; 1 ♀ (AEI), Oneonta, 31.VIII.1935, H. K. Townes. *Ohio:* 1 ♀ (MCZ), East Harbor, Ottawa Co., 4.IX.1964, H. E. Evans. *Ontario:* 11 ♀♀ (CNC) with same data as holotype; 2 ♀♀ (CNC) with same data as holotype but collected 8–31.VIII.1981; 2 ♀♀ (CNC), Aylmer, 8.IX.1978, L. Masner, G. Gibson, and H. Goulet; 2 ♀♀ (CNC), Brighton, 12.VIII.1954, J. C. Martin; 2 ♀♀ (CNC), 7 mi W Carleton Place, 1–18.IX.1981, S. J. Miller; 7 ♀♀ (CNC), 7 km SW Carleton Place, 7.VIII–11.IX.1980, S. J. Miller; 1 ♀ (CNC), Chatterton, 19.VIII.1951, J. C. Martin; 2 ♀♀ (CNC), Chatterton, 28.VII.1955, J. C. Martin; 1 ♀ (CNC), Chatterton, 25.VIII.1952, J. C. Martin; 11 ♀♀, 2 ♂♂ (CNC), Constance Bay, VIII.IX.1977, L. Masner; 2 ♀♀ (CNC), Constance Bay, July, 1959, S. M. Clark; 1 ♂ (CNC), Constance Bay, Carleton Place, 17–21.VIII.1977, M. Sanborne; 1 ♀ (CNC), Guelph, 3.IX.1976, C. D. Rolla; 1 ♂ (CNC), North Branch, 23.VII.1960, S. M. Clark; 1 ♀ (CNC), Ottawa, 5.IX.1940, O. Peck; 1 ♀ (CNC), Ottawa, 5.IX.1956, J. G. Chillcott; 8 ♀♀ (CNC), Mer Bleue, Ottawa, 4.VIII.1979, H. Goulet; 1 ♀ (CNC), Ottawa, Sportsplex Forest, 18.VIII.1981, L. Masner; 1 ♀ (CNC), Point Pelee, 8.IX.1954, G. S. Walley; 1 ♀ (CNC), Penetanguishene, 19.VIII.1955, J. G. Chillcott; 1 ♀ (CNC), 6 mi S Richmond, 13.IX.70, L. Masner; 1 ♀ (CNC), Rondeau Provincial Park, 30.VIII.1979, Malaise trap, L. Masner; 3 ♀♀, 2 ♂♂ (CNC), St. Lawrence National Park, McDonald Island, VIII.X.1976; 1 ♀ (CNC), Sandbanks Provincial Park, Prince Edward Co.,

13.VIII.1968, J. R. Vockeroth; 1 ♀ (CNC), Highway 16, near Spencerville, 2.VIII.1978, L. Masner; 6 ♀♀ (CNC), Driftwood Provincial Park, Stonecliffe, 2.IX–7.X.1979, Malaise trap, S. Peck; 1 ♀ (CNC), Kitchener, 5.IX.1971, K. J. G. Deacon. *Quebec*: 2 ♀♀ (CNC), Old Chelsea, 20.IX.1961, J. R. Vockeroth. *Pennsylvania*: 2 ♀♀ (NYCF), Erie, Erie Co., 21.IX–2.X.1971, E. J. Kurczewski; 4 ♀♀ (NYCF), Erie, Erie Co., 5–20.IX.1972, E. J. Kurczewski. *Rhode Island*: 1 ♂ (AEI), Westerly, 24.VIII.1935, M. Chapman. *Texas*: 2 ♀♀, 1 ♂ (USNM), Brownsville, 2.VII.1945, on cotton; 3 ♀♀ (FSC), Valley Botanical Garden, McAllen, Hidalgo Co., 1.XI.1973–31.I.1974, Malaise trap, C. C. Porter. *Wisconsin*: 1 ♀ (USNM), Polk Co., July, C. F. Baker. *Excluded from type series*: 1 ♀ (MSU), Bull Lake Biological Station, Kalamazoo, MI, 15.VIII.1964, R. W. Matthews.

REMARKS: This species can be readily distinguished from other Nearctic species of *Baryconus* by the shagreened hind margin of the scutellum. *Baryconus americanus* is apparently closely related to *B. europaeus* (Kieffer), a Palearctic species. The two species can be distinguished by the following characters: in female *B. europaeus*, A3 is distinctly longer than A4, A4 is 1.5 times as long as wide, and the venter of A1–A7 is black; in *B. americanus* A3 = A4, A4 is 2.0 times as long as wide, and the venter of A1–A7 is yellow; in male *B. europaeus* A10 is cubic, being only slightly longer than wide (~5%); in *B. americanus* A10 is distinctly longer than wide (~30%). The type of *B. europaeus* was examined for these comparisons. *Baryconus americanus* is the most widely distributed of all the North American species; the name *americanus* reflects its wide distribution.

***Baryconus bidentatus* n. sp.**

Figs. 5, 7, 16, 23, 30, 36

FEMALE: Holotype. Length 3.5 mm. Black; mandibles except base and tip brown; A1–A2, coxae amber; A3–A12, base and tip of mandible piceous brown; legs yellow. Mandible bidentate (Fig. 7); clypeus truncate, 0.33 mm wide, 0.07 mm long, distinctly wider than toruli; frons and gena costate (Fig. 5). Temples (dorsal view) slightly bulging behind eyes. Vertex shagreened, rugoreticulate; occipital carina complete, moderately strong; upper occiput coriaceous, lower occiput transversely rugulose; interocellar sculpture present, moderately weak; OOL = 0.5D, POL = 2.3D, LOL = 1.3D. Antennomere lengths (A1–A10, in millimetres): 0.60, 0.12, 0.15, 0.10, 0.10, 0.08, 0.08, 0.10, 0.10, 0.10, 0.12. Mesoscutum with median groove weak, complete, composed of a line of irregular, confluent punctures; notauli moderately strong, slightly

deeper and broader posteriorly. Scutellum rugoreticulate; hind margin shining, smooth. Metanotal armature well developed, bidentate (Fig. 16). Forewing 2.4 mm long, just reaching posterior margin of T5; hind wing 1.82 mm long. Metasoma moderately robust, 1.87 mm long; tergite lengths (T1–T6, in millimetres): 0.27, 0.38, 0.52, 0.29, 0.20, 0.16; T6 twice as wide as long, unarmed (Fig. 23).

MALE: Allotype differs from holotype as follows: length 3.55 mm; A3–A12 brown, coxae dark brown; occipital carina moderately weak; occiput wholly transversely rugulose; POL = 2.7D. Antennomere lengths (A1–A12, in millimetres): 0.48, 0.12, 0.16, 0.16, 0.15, 0.13, 0.12, 0.14, 0.14, 0.14, 0.16, 0.18; notauli much wider and deeper posteriorly; forewing just reaching tip of metasoma; metasoma 1.68 mm long; tergite lengths (T1–T7, in millimetres): 0.28, 0.33, 0.44, 0.26, 0.18, 0.12, 0.06; T6 at least 3.5 times as wide as long, T7 spikes distinct, (Fig. 30). Genitalia as in Fig. 36.

VARIABILITY: The following characters vary from the above: length from 2.6 to 4.0 mm; occipital carina from moderately strong to weak; occiput from shagreened dorsally and transversely rugulose ventro-laterally to entirely transversely rugulose; coxae from yellow to black; T6 in female from being twice as wide as long to having length and width about equal. Some specimens have mandibles that appear to be subtridentate; however, careful examination reveals that the apparent median tooth is a small flattened lobe from the lower margin of the upper tooth and is not a true tooth (Fig. 7). One specimen (♀) from Texas has a dark brown abdomen. Two specimens have been excluded from the type series as the mandibles appear to have small, but distinct, median teeth. This causes the specimens to key out to *B. floridanus* Ashmead. However, all other characters of these specimens agree with *B. bidentatus*; hence, the specimens have been placed in *B. bidentatus* but have been excluded from the type series.

TYPE MATERIAL: Holotype: ♀ (AMNH), Kalbfleisch Field Station, Huntington, NY, 1–15.VIII.1962, Malaise trap, P. H. Arnaud. Allotype, ♂ (AMNH), with same data as holotype. Paratypes (41 ♀♀, 92 ♂♂). *Arkansas*: 1 ♀ (UGA), Mission Co., 15.VII.1966; 1 ♂ (CNC), Big Brushy Recreation area, Ouachita National Forest, Mississippi Co., 30.VII.1975, H. Greenbaum. *Connecticut*: 1 ♀ (MCZ), Bethany, IX.1968, H. E. Evans. *Florida*: 1 ♀ (FSC), Doyle Conner Building, Gainesville, 28.VI–2.VII, Pan trap, E. E. Grissell; 1 ♀ (CNC Paratype No. 17234), Doyle Conner Building, Gainesville, 20–26.X.1975, Pan trap, E. E. Grissell. *Georgia*: 6 ♀♀, 2 ♂♂ (CNC), Forsyth, 22.VII–27.VIII.1970, Malaise trap, F.

FIGS. 4–9. Head and mouthparts of *Baryconus* spp., frontal view. Fig. 4. *B. americanus* n. sp., ♀, SEM. Fig. 5. *B. bidentatus* n. sp., ♂, SEM. Fig. 6. *B. clypeatus* n. sp., ♂, SEM. Fig. 7. *B. bidentatus* n. sp., ♂; right mandible showing development of median lobe, SEM. Fig. 8. *B. floridanus* Ashmead, ♀, SEM. Fig. 9. *B. minutus* n. sp., ♀ (Holotype), SEM. (Specimen in Fig. 7 is gold coated; all other specimens are uncoated.)

FIGS. 10, 11. Head and mouthparts of *Baryconus* spp., frontal view. Fig. 10. *B. noveboracensis* (Brues), ♀, SEM. Fig. 11. *B. unidentatus* n. sp., ♀ (Holotype), SEM. FIGS. 12–15. Thorax of *Baryconus* spp., dorsal view. Fig. 12. *B. americanus* n. sp., ♀, SEM. Fig. 13. *B. noveboracensis* (Brues), ♀, SEM. Fig. 14. *B. americanus* n. sp., ♀, showing shagreened hind margin of scutellum, SEM. Fig. 15. *B. noveboracensis* (Brues), ♀, showing smooth hind margin of scutellum, SEM. (Specimens for Figs. 14 and 15 are gold coated; all others are uncoated.)

T. Naumann. *Louisiana*: 1 ♀, 3 ♂♂ (CNC), Bayou Chicot, 28.VI–14.VII.1971, G. Heinrich; 1 ♂ (CNC), Chicot State Park, 21–27.VI.1971, G. Heinrich; 2 ♂♂ (CNC), Chicot State Park, Evangeline Co., 22–28.VII.1971, D. Shanck; 1 ♀ (USNM), Tallulah, VII.1948, R. C. Gaines. *Maryland*: 1 ♂ (UCD), Colesville, Montgomery Co., 15.VIII.1976, A. S. Menke; 1 ♀ (USNM), Glen Echo, 21.VIII.1923, J. R. Malloch; 1 ♀ (LACM), Glen Echo, 10.VIII, R. M. Fouts; 1 ♀ (USNM), Plummers Island, 1.IX.1962, K. V. Krombein. *Massachusetts*: 3 ♀♀, 2 ♂♂ (MCZ), Bedford, 1.VIII–10.IX.1968, Malaise trap, H. E. Evans; 1 ♂ (MCZ), Bedford, 15–18.VIII.1969, Malaise trap, H. E. Evans; 1 ♂ (MCZ), Martha's Vineyard, 22.VIII.1931, C. W. Johnson. *Michigan*: 1 ♂ (MSU), Gull Lake Biological Station, Kalamazoo Co., 9.VIII.1969, R. L. Fischer. *Missouri*: 4 ♀♀, 7 ♂♂ (MSU), Columbia, 19.VIII–25.IX.1967, Malaise trap, F. D. Parker; 1 ♀ (MSU), Columbia, 13–16.IV.1968, Malaise trap, F. D. Parker; 2 ♂♂ (MSU), Columbia, 16–31.VII.1968, Malaise trap, F. D. Parker; 8 ♀♀, 6 ♂♂ (UCD), Columbia, 21.VI–28.VIII.1970, 7 a.m. – 7 p.m., Malaise trap, F. D. Parker; 3 ♂♂ (UCD), Columbia, 7 a.m. – 7 p.m., 1–19.VIII.1967, Malaise trap, F. D. Parker; 1 ♂ (UCD), 27.VIII.1964, Columbia, Boone Co., Malaise trap, F. D. Parker; 1 ♀ (UCD), Columbia, 17.IX.1960, 7 a.m. – 7 p.m., Malaise trap, F. D. Parker; 2 ♀♀, 3 ♂♂ (CNC), Williamsville, 1.VII–15.VIII.1969, Malaise trap, J. T. Becker. *New York*: 3 ♀♀, 44 ♂♂ (AMNH), with same data as holotype but collected 10.VII–7.IX.1963; *North Carolina*: 1 ♂ (CNC), Charlotte, Mecklenburg Co., 25.VII.1977, Malaise trap, N.C.D.A.; 1 ♀, 2 ♂♂ (CNC), Doughton Park, Alleghany Co., 12.VIII.1977, Malaise trap, N.C.D.A. 1 ♂ (CNC), Highlands, 18.VII.1957, W. R. Richards; 1 ♂ (CNC), Highlands, NC, 27.VIII.1957, L. A. Kelton; 1 ♂ (CNC), Horse Cove, Highlands, 9–27.VIII.1957, L. A. Kelton; 1 ♂ (CNC), Horse Cove Bog, near Highlands, 2900 ft, 18.VII.1957, J. G. Chillcott. *Texas*: 1 ♂ (TAM), 6 mi SE Pearsall, 7.VII.1972, E. E. Grissell and J. Smith; 2 ♀♀ (TAM), Salmon, Anderson Co., 14–20.VII.1975, Malaise trap, H. R. Burke. *Virginia*: 1 ♂ (MCZ), Great Falls, 13.VIII; 1 ♂ (USNM), Vienna, J. C. Bridwell; 1 ♀ (USNM), 7.IX.1879. *Excluded from type series*: 1 ♂ (CNC), Delta National Forest, 4 mi E Rolling Fork, Starkey Co., MS, 1.X.1980, L. Masner and B. Bowen.

REMARKS: This species can be recognized by the mandibles being bidentate and the metasoma being moderately robust. If the flat lobe of the upper denticle (Fig. 7) is well developed and is interpreted as a true tooth, specimens of this species will be identified as being *Baryconus floridanus* Ashmead. However, female *B. bidentatus* tend to have T6 (Fig. 23) shorter and rounder than female *B. floridanus*; T7 (Fig. 30) in male *B. bidentatus* is shorter and the spikes are less well developed than in male *B. floridanus* (Fig. 32). Also, both sexes of *B. bidentatus* have the clypeus wider than the toruli, whereas in *B. floridanus* the clypeus is at most as wide as the toruli and usually narrower. The shape of the temples (dorsal view) will also distinguish these two species. In *B. bidentatus*, the temples are slightly bulging behind the eyes, whereas in *B. floridanus* they

are receding. There appears to be a north–south cline associated with the variation within *Baryconus bidentatus*. Specimens from the northeastern United States are very similar to the holotype and allotype; all extreme variations are in specimens from the southern United States. Individuals from intermediate localities are intermediate between the two extremes. It is quite likely that *B. bidentatus* is really a species complex rather than one highly variable species; however, this decision will have to wait for further study. Nothing is known about the biology of *Baryconus bidentatus*. The species is characterized primarily by its bidentate mandibles; it is on this character that the name is based.

***Baryconus clypeatus* n. sp.**

Figs. 6, 17, 24, 31, 37

FEMALE: Holotype. Length 3.4 mm. Black; scape, A3–A7, legs except coxae, and tarsi yellowish; tarsi amber, darker distally; mandible brown, teeth and base piceous brown; coxae piceous brown. Mandibles tridentate, median tooth subequal to lateral teeth; clypeus triangular, ventral margin produced into a point; frons and gena shagreened, with irregular shallow punctations, without costae (Fig. 6). Vertex strongly shagreened, with irregular shallow punctations; occipital carina strong, complete; occiput glabrous, with single row of setose tubercles below occipital carina; intercellular sculpture present, well defined; POL = 1.5D, LOL = 1.0D, posterior ocelli contiguous with inner orbits of eyes. Antennomere lengths (A1–A12, in millimetres): 0.60, 0.13, 0.10, 0.10, 0.10, 0.10, 0.13, 0.11, 0.11, 0.11, 0.13. Mesoscutum flattened; median groove weak, replaced by irregular row of punctations, wider posteriorly; notauli complete, strong, much wider and deeper posteriorly. Scutellum moderately rugoreticulate; hind margin shining smooth; metanotal armature well developed, bidentate (Fig. 17). Forewing 2.4 mm long, extending past tip of metasoma hind wing 1.7 mm long. Metasoma 1.6 mm long; tergite lengths (T1–T6, in millimetres): 0.24, 0.34, 0.52, 0.26, 0.18, 0.06; T6 with moderately well developed spikes, 0.06 mm long, 0.16 mm apart (Fig. 24).

MALE: Allotype differs from holotype as follows: length 3.2 mm; antenna entirely yellow; antennomere lengths (A1–A12, in millimetres): 0.48, 0.10, 0.14, 0.12, 0.12, 0.10, 0.10, 0.10, 0.10, 0.10, 0.09, 0.15; meso- and meta-basitarsus expanded, laterally compressed; forewing 2.1 mm, hind wing 1.6 mm; metasoma 1.5 mm long; tergite lengths (T1–T7, in millimetres): 0.22, 0.26, 0.44, 0.29, 0.16, 0.08, 0.05; width to length ratio of T7 greater than 4.0; T7 with moderately well-developed spikes, 0.06 mm long, 0.15 mm apart (Fig. 31). Genitalia as in Fig. 37.

VARIABILITY: Very little variation was observed in the type-series. Length varied from 3.2 mm to 3.5 mm;

specimens from Mexico had the vertex and gena more shagreened than those from the United States.

TYPE MATERIAL: Holotype: ♀ (AMNH), Southwestern Research Station, 5400 ft, 5 mi W Portal, Cochise Co., AZ, 10.IX.1965, V. D. Roth. Allotype: ♂ (USNM), Harlingen, TX, VIII.1957, reared from unidentified katydid egg. Paratypes (127 ♀♀, 4 ♂♂). *Arizona*: 109 ♀♀, 1 ♂, with same data as holotype except as follows: 17 ♀♀ (AMNH), collected 4.IX–22.X.1965; 30 ♀♀ (CAS), collected 6.IX–21.X.1966, P. H. Arnaud; 48 ♀♀ (CAS), collected 10–25.IX.1978, P. Arnaud; 1 ♂ (UCR), collected 18.VI.1965, P. Arnaud; 2 ♀♀ (AMNH), collected 1.X.1964; 4 ♀♀ (UCD) collected 27.VI.1967 and reared from katydid eggs; 3 ♀♀ (UCD), collected 7–14.IX.1965; 1 ♀ (UCD), collected 7.X.1964; 1 ♀ (AMNH), collected 13.VI.1963; 2 ♀♀ (AMNH), collected 21.IX.1962; 1 ♀ (CDA), collected 14–15.VIII.1978, Malaise trap, M. Wasbauer; 1 ♀ (AEI), Portal, 1974, H. and M. Townes; 1 ♀ (AMNH), Cave Creek Canyon, Chiricahua Mountains, Cochise Co., 27.VI.1967, V. D. Roth, reared from unidentified katydid eggs (accompanying specimen); 3 ♀♀ (CNC, Paratype No. 17235), Ramsey Canyon, Huachuca Mountains, R. F. Sternitzky. *Texas*: 1 ♀ (FSC), Valley Botanical Garden, McAllen, Hidalgo Co., XI.1973, Malaise trap, C. C. Porter; 2 ♀♀, 2 ♂♂ (USNM), Harlingen, VIII.1957, reared from unidentified katydid eggs. *Mexico*: 9 ♀♀, 1 ♂ (USNM), Cuernavaca, Morales, IV.1945 from unidentified Orthoptera egg on *Eupatorium adenophorum*, N. L. H. Krauss; 1 ♀ (CNC), 3000 ft, 20 mi E Concordia, Sinaloa, 4.VIII.1964, W. R. M. Mason.

REMARKS: This species can be readily distinguished from all other Nearctic species of *Baryconus* by its pointed clypeus, the unique sculpturing of the vertex, the posterior ocelli being contiguous with the inner orbit of the eye, and by the expansion of the meso- and meta-basitarsus (especially in males). These character states show that *B. clypeatus* is apparently more closely related to *B. erythrothorax* (Kieffer) and some other Neotropical species than it is to other Nearctic species. *Baryconus clypeatus* appears to be limited to the southwestern United States and Mexico. Little is known about its biology, other than it has been reared from unidentified katydid eggs. The specific name *clypeatus* is based on the unique shape of the clypeus among the Nearctic species.

***Baryconus floridanus* Ashmead**

Figs. 8, 20, 25, 32, 38

Baryconus floridanus Ashmead, 1887. Entomol. Am. 3: 118, ♂.

Hoploleleia floridana (Ashmead); Ashmead 1893. U.S. Natl. Mus. Bull. No. 45, p. 211.

Baryconus floridanus Ashmead; Muesebeck and Walkley 1956. Proc. U.S. Natl. Mus. 105: 32.

TYPE: Lectotype ♂, USNM; designated by Muesebeck and Walkley, 1956, p. 32. Examined.

MALE: (Redescription of lectotype). Length 3.25 mm. Black; mandible except tip and base, A1, venter of A2, A5 sex modification, legs yellow; tip and base of mandible dark brown; dorsum A2, A3–A12 brown. Mandible subtridentate, median tooth subequal to lateral teeth; clypeus truncate, 0.2 mm wide, 0.05 mm long, narrower than toruli; frons and gena moderately costate (as in Fig. 8). Temples (dorsal view) narrowed behind eyes. Vertex strongly rugoreticulate; occipital carina strong, complete; OOL = 0.3D, POL = 2.5D, LOL = 1.3D; interocellar sculpture absent. Antennomere lengths (A1–A12, in millimetres): 0.42, 0.11, 0.16, 0.14, 0.14, 0.12, 0.12, 0.12, 0.12, 0.12, 0.12, 0.19. Mesoscutum moderately flattened; median furrow moderately strong, weakening anteriorly; notauli moderately strong, moderately wider and deeper posteriorly (as in Fig. 20). Scutellum rugoreticulate, hind margin shining smooth. Metanotal armature well developed, bidentate. Forewing 2.3 mm long, extending past tip of metasoma; hind wing 1.7 mm long. Metasoma 1.8 mm long; tergite lengths (T1–T7, in millimetres): 0.24, 0.31, 0.40, 0.25, 0.16, 0.10, 0.05. Spikes on T7 well developed, 0.12 mm long, 0.18 mm apart (as in Fig. 32). Genitalia as in Fig. 38. Condition fair; right antenna beyond A3, left front and rear legs, other legs beyond femora missing; wings stuck to abdomen; left spike of T7 broken at base, remaining one distinct.

FEMALE: (Previously unknown). Differs from lectotype as follows: vertex weakly shagreened rugoreticulate; antennal club poorly developed; relative length of antennomeres (A1–A12): 0.60, 0.15, 0.17, 0.14, 0.14, 0.10, 0.08, 0.12, 0.12, 0.12, 0.10, 0.15; occipital carina moderately weak; median furrow and notauli moderately weak; forewing not reaching anterior margin of T6; relative lengths of metasomal tergites (T1–T6): 0.30, 0.45, 0.65, 0.40, 0.30, 0.25; T6 triangular, unarmed (Fig. 25).

VARIABILITY: There is considerable variation in the coloration of appendages in *B. floridanus*. A1 and A2 are yellow in some specimens, dark brown in others; similar variation occurs in the coloration of the femora. The sculpture of the vertex is also highly variable; in the lectotype the vertex is strongly rugoreticulate, whereas in other specimens the vertex is only weakly sculptured. Total body length varies from 3.2 mm to 4.4 mm.

Figs. 16–21. Thorax of *Baryconus* spp., dorsal view. Fig. 16. *B. bidentatus* n. sp., ♂, SEM. Fig. 17. *B. clypeatus* n. sp., ♀, SEM. Fig. 18. *B. minutus* n. sp., ♀ (Holotype), SEM. Fig. 19. *B. minutus* n. sp., ♀ (Holotype), scutellum and metanotal armature, SEM. Fig. 20. *B. floridanus* Ashmead, ♀, SEM. Fig. 21. *B. unidentatus* n. sp., ♀ (Holotype), SEM. (All specimens are uncoated.)

FIGS. 22–28. Female terminal abdominal tergite (T6) of *Baryconus* spp. FIGS. 29–34. Male terminal abdominal tergites (T6 and T7) of *Baryconus* spp. FIGS. 22, 29. *B. americanus* n. sp. FIGS. 23, 30. *B. bidentatus* n. sp. FIGS. 24, 31. *B. clypeatus* n. sp. FIGS. 25, 32. *B. floridanus* Ashmead. FIGS. 26, 33. *B. minutus* n. sp. FIGS. 27, 34. *B. noveboracensis* (Brues). FIG. 28. *B. unidentatus* n. sp. (Male unknown.)

FIGS. 35–40. Male genitalia of *Baryconus* spp. Fig. 35. *B. americanus* n. sp. Fig. 36. *B. bidentatus* n. sp. Fig. 37. *B. clypeatus* n. sp. Fig. 38. *B. floridanus* Ashmead. Fig. 39. *B. minutus* n. sp. Fig. 40. *B. noveboracensis* (Brues). (Male *B. unidentatus* unknown.)

MATERIAL EXAMINED: (77 ♀♀, 75 ♂♂). Lectotype, ♂ (USNM), Jacksonville, FL, Type No. 24538; Paralectotype, ♂ (USNM), Jacksonville, FL, Type No. 24539. *Florida*: 3 ♀♀ (FSCA, USNM); Alachua Co., Gainesville, Orange Co.; June, July, September. *Georgia*: 3 ♀♀, 3 ♂♂ (CNC); Forsyth; July–September. *Illinois*: 2 ♀♀, 1 ♂ (INHS, MCZ); Chicago, Justice, Muncie; July–August. *Iowa*: 1 ♀ (USNM); County No. 28; July. *Kentucky*: 1 ♂ (AEI); mile 170 of Blue Ridge Parkway; September. *Louisiana*: 2 ♀♀ (CNC, USNM); Bayou Chicot, Tallulah; June–July. *Maine*: 3 ♀♀ (CNC); Dryden; August. *Maryland*: 1 ♀ (AEI); Bowie; August. *Massachusetts*: 4 ♀♀, 3 ♂♂ (MCZ); Bedford, Dedham, Framingham, Riverside; July–September. *Michigan*: 2 ♀♀, 9 ♂♂ (AEI, MSU, USNM); Ann Arbor, Gull Lake Biological Station, St. Charles; July–October. *Mississippi*: 1 ♀ (CNC); Delta National Forest; October. *Missouri*: 14 ♀♀, 3 ♂♂ (CNC, MSU, UCD); Columbia, Williamsville; April–September. *New Jersey*: 1 ♂ (AEI); Moorestown; August. *New York*: 11 ♀♀, 25 ♂♂ (AEI, AMNH, MCZ, MSU, USNM); Brainard, Farmingdale, Huntington, Ithaca, Lynbrook, Poughkeepsie, Powder Mills, Troy; July–September. *North Carolina*: 3 ♀♀, 1 ♂ (AEI, CNC); Hamrick, Highlands, Smokemont; July–August. *Ontario*: 24 ♀♀, 20 ♂♂ (CNC); Hamilton, Point Pelee, Rondeau Provincial Park, St. Lawrence Islands National Park; July–September. *Rhode Island*: 1 ♂ (AEI); Westerly; August. *South Carolina*: 1 ♂ (AEI); Columbia; July. *Tennessee*: 1 ♀, 2 ♂♂ (CNC, MCZ, MSU); Great Smokey Mountain National Park, Lexington, Smokey Mountain; June–September. *Texas*: 2 ♀♀, 2 ♂♂ (TAM, USNM); Brazos Co., Uvalde, Waco; June, July, October. *Virginia*: 1 ♂ (AEI); Skyline Drive; August.

REMARKS: *Baryconus floridanus* lacks a unique character to distinguish it from other species. Males are very similar to males of *B. americanus* but can be distinguished by the shining smooth hind margin of the scutellum. Female *B. floridanus* are very similar to female *B. noveboracensis* and are distinguished from them by the lack of minute spikes on T6. Nothing is known about the biology of this species.

***Baryconus minutus* n. sp.**

Figs. 9, 18, 19, 26, 33, 39

FEMALE: Holotype. Length 2.6 mm. Black; antenna, mandible, legs piceous brown; apical and distal ends of A1 and femora, distal end of coxae yellowish; apical and distal ends of mandibles piceous. Mandible tridentate, median tooth equal to lateral teeth; clypeus truncate, 0.17 mm wide, 0.03 mm high, narrower than toruli; frons and gena moderately costate (Fig. 9). Temples (dorsal view) narrowed behind eyes. Vertex shagreened, with sparse, faint rugosity, rounded posteriorly; occipital carina complete, weak; occiput finely coriaceous; OOL = 0.5D, POL = 2.5D, LOL = 1.5D. Antennomere lengths (A1–A12, in millimetres): 0.46, 0.09, 0.10, 0.08, 0.08, 0.07, 0.07, 0.08, 0.08, 0.08, 0.08, 0.10. Mesoscutum rounded, rugose posteriorly; median groove complete, represented as a weak line of irregular confluent punctures; notauli complete, weak,

slightly broader and deeper posteriorly (Fig. 18). Scutellum convex, weakly rugose, hind margin shining smooth. Metanotal armature reduced to a small rounded lobe (Fig. 19). Forewing 1.7 mm long, not reaching past tip of metasoma; hind wing 1.3 mm long. Metasoma 1.33 mm long; tergite lengths (T1–T6, in millimetres): 0.17, 0.25, 0.37, 0.22, 0.16, 0.16; T6 triangular, unarmed (Fig. 26).

MALE: Allotype differs from holotype as follows: length 2.4 mm; antennomere lengths (A1–A12, in millimetres): 0.32, 0.07, 0.12, 0.12, 0.11, 0.11, 0.11, 0.11, 0.11, 0.11, 0.16; forewing 1.5 mm long; not reaching anterior margin of T6; hind wing 1.1 mm long; metasomal tergite lengths (T1–T7, in millimetres): 0.16, 0.20, 0.32, 0.18, 0.12, 0.06, 0.05; T7 spikes indistinct, 0.12 mm apart, 0.06 mm long (Fig. 33). Genitalia as in Fig. 39.

VARIABILITY: The paratypes vary mainly in size, ranging from 2.4 to 2.8 mm in length; other measurements vary accordingly. One ♂ paratype has the notauli much stronger than the holotype and the posterior part of the median groove gradually widens into an area of rugosity.

TYPE MATERIAL: Holotype: ♀ (CNC No. 17236), Menifee Valley, 1800 ft, Riverside Co., CA, 15.VI.1980, Malaise trap, J. Wooley and J. LaSalle. Allotype: ♂ (CNC), Menifee Valley, 1800 ft, Riverside Co., CA, 1–15.VI.1980, Malaise trap, J. Wooley and J. LaSalle; abdomen and T7 separate, glued to point. Paratypes (4 ♀♀, 2 ♂♂). *California*: 2 ♀♀ (CNC), with same data as holotype but collected 1–20.VII.1980, J. B. Wooley, J. Pinto, J. LaSalle; 1 ♂ (CNC), with same data as holotype but collected 23–27.V.1980, Pan trap, J. Pinto; 1 ♀ (CDA), Agua Caliente Creek, 3100 ft, Warner Springs, San Diego Co., 23–24.VIII.1980, Malaise trap, M. Wasbauer and P. Adams; 1 ♀ (UCA), Alpine Lake, Marin Co., IX.1961, Thornsteinson heliothermal trap, E. P. Catta; 1 ♂ (CAS), Mill Valley, 1–2.VII.1965, P. Arnaud.

REMARKS: This species can be distinguished from all other Nearctic species of *Baryconus* by the weakly unidentate armature on the metanotum (both sexes), the scutum being rugulose between the posterior parts of the notauli, and by the minute posterolateral points on T7 in males. The presence of this species in California represents a major range extension of *Baryconus* in North America. Nothing is known about the biology of this species. The name *minutus* reflects the small size of the insect.

***Baryconus noveboracensis* (Brues)**

Figs. 10, 13, 15, 27, 34, 40

Hoploteleia noveboracensis Brues, 1908. Wis. Nat. Hist. Soc. Bull. No. 6, p. 49, ♂. Original designation.

Baryconus noveboracensis (Brues); Muesebeck, 1979, Catalogue of Hymenoptera in America north of Mexico, Vol. 1, p. 1153.

TYPE: Holotype ♂, MPM. Examined.

MALE: (Redescription of holotype). Length 3.89 mm. Black; mandible, A3–A12, coxae, tarsi dark brown; A1–A2 amber; legs yellow. Mandible tridentate, median tooth subequal to lateral teeth; clypeus truncate, 0.16 mm wide, 0.05 mm long, narrower than toruli; gena costate (as in Fig. 10). Temples (dorsal view) narrowed behind eyes. Vertex moderately rugoreticulate, weakly shagreened; OOL = $0.5D$, POL = $2.5D$, LOL = $1.5D$; interocellar sculpture present, moderately strong. Occipital carina complete, strong; occiput weakly transversely rugulose. Antennomere lengths (A1–A12, in millimetres): 0.48, 0.11, 0.21, 0.17, 0.15, 0.14, 0.14, 0.12, 0.15, 0.16, 0.16, 0.24. Mesoscutum moderately flattened; median groove complete, moderately strong, represented as a line of irregular confluent punctures; notauli strong, moderately wider and deeper posteriorly (as in Fig. 13). Scutellum rugoreticulate; hind margin slightly shagreened laterally, shining smooth medially (as in Fig. 15). Metanotal armature well developed. Forewing 2.6 mm long, not reaching anterior margin of T6; hind wing 1.8 mm long. Metasoma 2.0 mm long; tergite lengths (T1–T7, in millimetres): 0.30, 0.36, 0.58, 0.33, 0.20, 0.14, 0.09; T6 three times wide as long; T7 with well-developed spikes, 0.21 mm apart, 0.18 mm long (as in Fig. 34). Genitalia as in Fig. 40.

FEMALE: (Previously unknown). Differs from holotype as follows: mandible except base and tip, A1, venter of A2 yellow; vertex more strongly shagreened and sculptured; OOL = $0.3D$, POL = $2.3D$, LOL = $0.8D$; relative antennomere lengths (A1–A12): 0.60, 0.11, 0.13, 0.12, 0.11, 0.09, 0.09, 0.11, 0.11, 0.11, 0.10, 0.10; notauli strong; scutellum more strongly rugoreticulate; forewing reaching middle of T5; relative tergite lengths (T1–T6): 0.27, 0.47, 0.64, 0.41, 0.30, 0.30; T6 with minute, posterolateral points anterior to apex (Fig. 27).

VARIABILITY: Length 3.8–4.2 mm; coxae sometimes orange yellow; forewing of ♀ sometimes not reaching anterior half of T5; forewing of ♂ sometimes reaching middle of T6.

MATERIAL EXAMINED (23 ♀♀, 26 ♂♂): Holotype: ♂ (MPM), New York City, NY. *Florida*: 5 ♀♀, 4 ♂♂ (CNC, FSCA); Austin Carey Forest, Gainesville, Lake Carr, Taylor Co.; January, May–September. *Georgia*: 1 ♀ (CNC); Forsyth; July. *Louisiana*: 1 ♂ (CNC); Bayou Chicot; June–July. *Mississippi*: 1 ♀, 1 ♂ (CNC); Delta National Forest; October. *New Jersey*: 5 ♂♂ (AEI, MCZ, MSU, USNM); Chatsworth, Moorestown, Oswego Lake, Wharton State Forest; July–September. *North Carolina*: 2 ♀♀, 2 ♂♂ (USNM); Kill Devil Hills; July–August. *South Carolina*: 5 ♀♀, 6 ♂♂ (AEI, CNC); Hilton Head Island, McClellanville, Myrtle Beach; July–August. *Texas*: 9 ♀♀, 7 ♂♂ (FSCA, MCZ, TAM); Brownsville, Galveston, McAllen, Salmon; June–July, September–December.

REMARKS: Females of *B. noveboracensis* are easily distinguished from all other Nearctic species by the minute posterolateral points anterior to the apex of T6 (Fig. 27). Males can be distinguished by the extremely well-developed spikes on T7 (Fig. 34) and by having T6 less transverse (i.e., width to length ratio approximately 3.0). Nothing is known about the biology of this species.

Baryconus unidentatus n. sp.

Figs. 11, 21, 28

FEMALE: Holotype. Length 2.56 mm. Black; base of A1, A2–A4, mandible, legs except coxae and femora amber; base and teeth of mandible, coxae, femora brown. Mandible unidentate, upper tooth reduced to flat lobe; clypeus truncate, 0.2 mm wide, 0.04 mm long, wider than toruli, anterolateral corners produced into rounded lobes (Fig. 11). Temples (dorsal view) narrowed behind eyes. Vertex shagreened, moderately rugoreticulate; occipital carina complete, weak; occiput transversely rugulose; interocellar sculpture absent; OOL = $0.5D$, POL = $4.0D$, LOL = $2.0D$. Antennomere lengths (A1–A12, in millimetres): 0.46, 0.10, 0.10, 0.08, 0.08, 0.06, 0.06, 0.08, 0.08, 0.08, 0.08, 0.10. Mesoscutum moderately rounded; median groove moderately weak, complete, represented as a line of irregular confluent punctures; notauli complete, moderately weak, slightly broader and deeper posteriorly; scutellum rounded, rugoreticulate (Fig. 21). Forewing 1.66 mm long, not reaching anterior margin of T5; hind wing 1.25 mm long. Metasoma moderately robust, 1.25 mm long; tergite lengths (T1–T6, in millimetres): 0.19, 0.30, 0.37, 0.20, 0.13, 0.09; T6 subtriangular, unarmed (Fig. 28).

MALE: Unknown.

VARIABILITY: Two paratypes (1 FSC, 1 USNM) have a small, weak upper tooth instead of the flat lobe that is present in the holotype; also, two females have the abdomen piceous instead of brown.

TYPE MATERIAL: Holotype: ♀ (FSCA), Valley Botanical Gardens, McAllen, Hidalgo Co., TX, X.1973, Malaise trap, C. C. Porter, left antenna missing. Paratypes (4 ♀♀). *Texas*: 2 ♀♀ (FSCA), 1 ♀ (CNC, Paratype No. 17237), with same data as holotype. 1 ♀ (USNM), Beeville.

REMARKS: This species can be distinguished from other Nearctic species by the unique, unidentate mandibles and by the anterolateral projections of the clypeus. The very weak upper tooth on the mandible, present in two paratypes, is probably easily broken, resulting in the flat lobe that is present in the holotype. Nothing is known about the biology of this species. The unique shape of the mandibles is the basis for the specific name *unidentatus*.

Acknowledgments

We thank Dr. P. M. Marsh (United States National Museum) for the loan of the lectotype of *B. floridanus*.

- Ashmead, Dr. G. Noonan (Milwaukee Public Museum) for the loan of the type of *B. noveboracensis* (Brues), and Dr. F. Bin (University of Perugia, Italy) for the loan of the type of *B. europaeus* (Kieffer). Mr. L. Ling (Carleton University) kindly took the scanning electron microscope pictures for us. We also thank Drs. H. Howden and S. B. Peck (Carleton University) and Dr. C. D. Dondale (Biosystematics Research Institute) for their comments on this paper.
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