

THE GENUS BANDARA BALL
(Homoptera: Cicadellidae)

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Genus *Bandara* Ball

1931. Bull. Brooklyn Ent. Soc. 26: 93.

This is a small group of golden yellow leafhoppers, closely related, and intermediate between *Eutellix* and *Mesamia*. Three species, *B. johnsoni* (V. D.), the genotype; *animana* (Ball) and *aurata* (Ball) have been described and three additional species are described here.

B. animana (Ball) is represented by the single male holotype in the U. S. N. M. Collection and has not been examined. The description indicates that it is quite distinct from the species treated here.

An interesting additional character is the secondary seta, occasionally more than one, on the antenna, which emerges at the base of the third segment.

Through the kindness of Dr. C. F. W. Muesebeck and Dr. R. H. Beamer material from the National Museum and from the University of Kansas collections was included in this study.

KEY TO BANDARA

1. Elytra with pale rounded spots.....2
Elytra unicolorous..... *aurata*
2. Aedeagus in male narrow, split at apex; last ventral segment in female with prong either side of a median notch.....3
Aedeagus broad; female segment with median portion produced.....4
3. Aedeagus in lateral view short, straight, distinctly bifid apically; in female segment deeply incised at middle..... *johnsoni*
Aedeagus in lateral view bent dorsad near apex; apical prongs appressed; median incision in female segment shallow..... *curvata*
4. Pygofer process in male long, heavy, straight; female segment with median portion broadly produced..... *inflata*
Pygofer process short, stout and spiny; female segment with narrow notched median projection..... *parallela*

Bandara johnsoni (V. D.)

Eutellix johnsoni Van Duzee, Can. Ent. 26: 136-7, 1894.

Described originally from specimens collected in Philadelphia, Pa. Specimens have been examined from Conn., Maine, Md., Mass., Miss., N. J., N. Y., Ohio, Tenn. and Virginia.

The more complete description of the genitalia will supplement Van Duzee's excellent description.

Female.—Last ventral segment one-fourth longer than broad, with median longitudinal carina; posterior margin with sides cut out, straight, incised at middle one-fourth or more length of segment, a small prong either side of incision not extending far beyond segment.

Male.—Valve broad, triangular, apex truncate; plates broad and short, narrowed on apical third to blunt apices; pygofers short and stout, a short narrow spike on ventral edge; styles narrowed to long, blunt chitinized finger apically; aedeagus with almost semi-circular base, lower edges narrowed to sharp lateral spines; shaft slender, in ventral view straight, parallel-sided to apical third where it is distinctly bifid, prongs well separated; in lateral view straight, a rather broad dorsal projection near middle extends back even with base, this projection is a third longer than broad and more heavily chitinized on ventral surface. The narrower base and curved, distinctly bifid aedeagus distinguish this from *B. curvata* n. sp.

Length: male 4.5–4.75 mm.; female 5–5.5 mm.

***Bandara curvata* n. sp.**

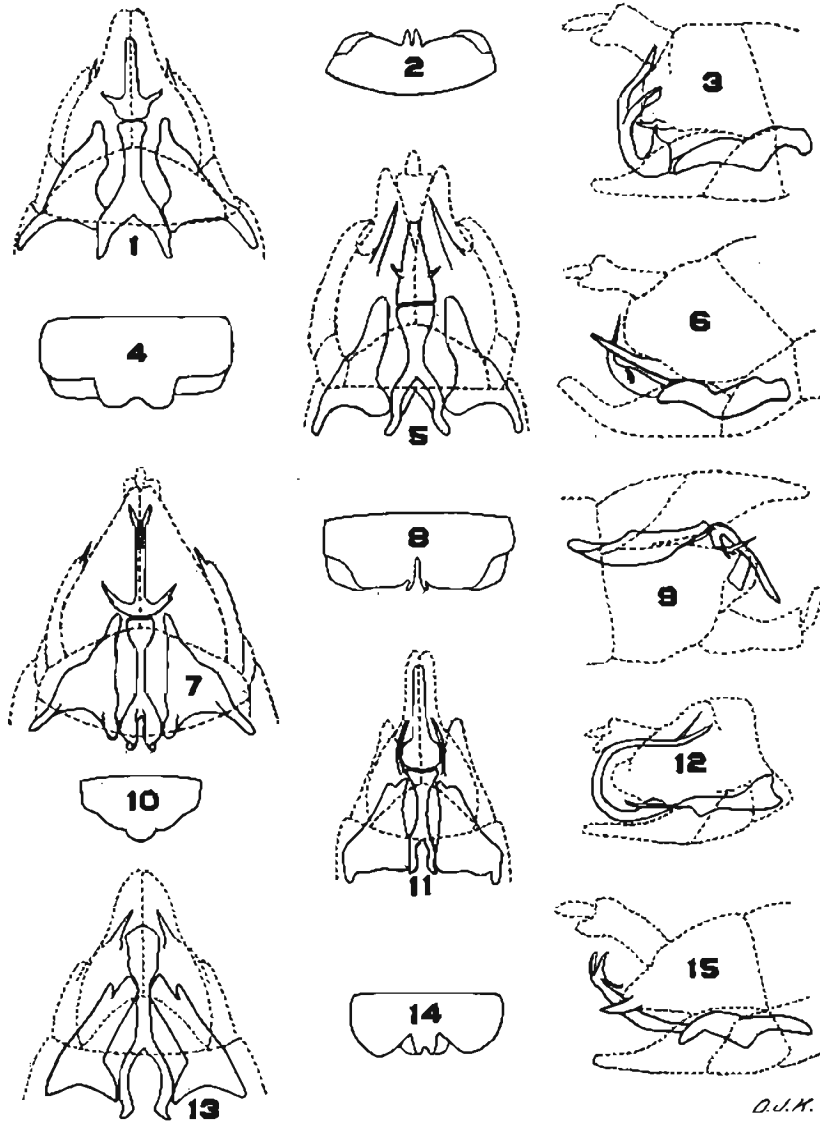
Resembling *B. johnsoni* (V. D.) very closely in color pattern, usually a little smaller, but with distinct genitalia in both sexes. The distribution is more generally southern and western than in *johnsoni*.

Vertex sloping, slightly longer at middle than next to eye, anterior margin forming a distinct ridge in lateral view. Pronotum slightly broader than head; more than twice as broad as long. Anterior margin evenly rounded, posterior margin almost transverse. Elytra long, broad, apices rounded, venation distinct.

Color: Vertex creamy yellow, six black dots in pairs on anterior margin, median pair close together, outer pairs either side of ocelli, outermost dots next to black eyes; disc golden; posterior margin with four creamy transverse yellow spots, median larger, lateral triangular next to eyes. Pronotum golden with median narrow yellow stripe from base almost reaching anterior margin, a pair of lateral broader stripes extending beyond middle and several pale spots below eye. Scutellum golden with pale triangular areas either side of dark impressed median line, and apex pale. Elytra golden, darker in male, subhyaline, with distinct pale spots as follows on each: three small round spots evenly spaced along suture, one at middle, others half way between it and humeral angle; humerus along claval vein; and two small spots on anterior disc. Corial and apical pale spots are larger and more diffuse toward the hyaline costa and form three irregular transverse bands; anterior starting opposite apex of clavus, median just anterior to crossveins and posterior across anterior discs of apical cells. In the male, dark brown points appear at apex of clavus, inner apical crossveins and outer veins in costal margin. Below pale yellow, spines on hind legs darkened at base; wavy black line below apex of head broken at middle and narrowed below ocelli.

*Female*¹: Last ventral segment short, with a median longitudinal carina, lateral angles incised, median posterior margin with pair of long projecting teeth, incision dividing them scarcely deeper than margin. Pygofer and ovipositor stout, short, stout bristles either side of ovipositor.

¹Drawings for *Eulellix (Mesamia) johnsoni* Ball, Proc. Dav. Acad. Sciences 12: 66, pl. 3, figs. 8b, 8c, probably refer to this species.



Figs. 1-15. *Bandara curvata* n. sp. 1-3; *inflata* n. sp. 4-6; *johnsoni* (V. D.) 7-9; *curvata* (Ball) 10-12; *parallela* n. sp. 13-15.

Male.—Valve bluntly triangular; plates broad at base, narrowed to rounded apices on apical third; styles blunt, heavily chitinized; pygofer with short stubby process on inner margin, sometimes bluntly toothed; aedeagus in ventral view with broad rectangular base, a dorsally curved prong from each lower outer angle; shaft long and narrow, parallel-sided to apical third where it is split, but the parts usually remain appressed, seldom as widely separated as in *B. johnsoni*. In lateral view the apical third is curved dorsad at somewhat less than a right angle, the apex bent slightly down, a thin dorsal process, chitinized more heavily on its ventral margin, arises at about half length of shaft and extends back parallel with and as far as the apex.

Length: male, 4.5 mm.; female, 5 mm.

In the collection of The Ohio State University: Male *holotype*, Delaware Co., Ohio, Sept. 9, 1945, D. J. & J. N. Knull; *allotype*, Delaware Co., Ohio, Sept. 9, 1943, D. J. & J. N. Knull; paratypes from Ohio: Clyde, Aug. 26, 1934, Whittington, A. C. Miller Collection; Champaign Co., Aug. 31, 1931, E. P. Breakey; Fairfield Co., June 16, 1945; and Hocking Co., Sept. 3, 1939 and Sept. 14, 1944, D. J. & J. N. Knull. From Iowa: Arnes, Aug. 13, 1896, Experiment Station, Aug. 25, 1897 and Sept. 10, 1895, H. Osborn. From Mississippi: Agr. College, July 20, 1920, A. McIntosh; Durant, June 10, 1933; Heidelberg, June 6, 1934, *Fraxinus*: Leland, May 30, 1933; and Okoloma, June 14, 1934, all D. W. Grimes. From Tennessee, Great Smoky Mt. Nat. Park, June 7 and 21, 1942, D. J. and J. N. Knull, on persimmon.

Paratypes in Collection of the University of Kansas: Prattsburg, Ga., July 25, 1930, R. H. Beamer; Magnolia, Tenn., Feb. 4, 1915; Clarksville, Tenn., Aug. 13, 1914; Arlington, Va., Sept. 19, 1943, R. H. Beamer.

Paratypes in U. S. N. M. Collection: Cuthbert, Ga., May 16, 1916, W. D. Pierce; Hardison Co., Ga., June 26, 1940, *Prunus angustifolia*, Turner; D. C., July 9, 1886, T. Pergande; Glenn Echo, Md., Summer 1922, J. C. Bridwell; Plummers Id., Md., July, 1907, Wm. Palmer; Md.; Hamilton Co., Tenn., May 28, 1939, Turner; Nelson Co., Va., July 19, 1924, W. Robinson; Vienna, Va., Sept. 20, 1932, J. C. Bridwell.

***Bandara inflata* n. sp.**

Large, in general form and color pattern very similar to *johnsoni* and *curvata*, the color is generally more orange gold, white spots small and distinct on clavus; outer edges of elytra becoming almost entirely hyaline, pale bands broader; and in most specimens the scutellum is bright yellow except for golden basal angles.

Female.—Last ventral segment truncate and produced on median third in rather angulate lobe, indented at middle.

Male.—In ventral view valve short, obtusely triangular; plates broad on basal two-thirds, narrowed and slightly divergent apically, exceeding pygofer; aedeagus broad on basal half, with a pair of short spines curved down near base, and apex which is curved dorsad is divided forming two attenuate divergent spines; pygofer rounded, a long heavy spine on ventral edge reaching almost to apex of plate; styles broad, blunt and heavily chitinized.

Length: Male, 5 mm.; female, 5.5 mm.

Male *holotype*, Franklin Co., O., Aug. 10, 1931, E. P. Breakey; *allotype*, Fairfield Co., O., July 10, 1945, D. J. & J. N. Knull; *paratypes*, Worthington, Brown Fruit Farm, O., Aug. 21, 1928; and Tryon, N. C., light, July 20, W. F. Fiske. These are in the Collection of the Ohio State University. One male *paratype* in U. S. N. M., Raleigh, N. C., mid-July, 1909.

Bandara parallela n. sp.

A small, dark form with parallel-margined vertex. Some males are brown with a dark dorsum which shows through the elytra. Some specimens have an indication of dark arcs on face. In respect to general structure and color pattern it closely resembles *B. curvata*.

Female.—Segment short with three lobes of equal length, lateral broad, median narrow and incised about one-third its length.

Male.—Plates broad, gradually tapered to blunt apices, valve obtusely triangular, a little more than one-third length of plates, pygofer short, not much exposed in ventral view, exceeded by plates, a unique heavy, sharp-pointed process on posterior ventral margin projecting and covered except for apex by a thick hairy coat. Aedeagus broad in ventral view, curved dorsad toward apex, two pairs of delicate processes project from lateral edges near apex, anterior turns sharply up close to shaft, then latero-dorsad apically; posterior is broader at base, bent almost at right angle to shaft, and turned up at apex. Styles blunt tipped and heavily chitinized.

Length: Male, 4.25 mm.; female, 4.5–5 mm.

Male *holotype*, Hocking Co., O., Sept. 5, 1945; *allotype*, Fairfield Co., O., July 10, 1945; *paratypes*: Delaware Co., O., Sept. 1, 1944, all D. J. & J. N. Knull; Orono, Me., Aug. 6, 1913, H. Osborn; Ames, Ia., Sept. 3, 1892, H. Osborn; A. & M. College, Miss., May 29, 1930, R. I. Horst. These are in the Collection of The Ohio State University. *Paratypes* in the U. S. N. M. Collection: Catons Bush, Sept. 25, Baker Coll.; Forest Glen, Md., Sept. 15, 1915, O. Heidemann; Glen Echo, Md., summer, 1922, J. C. Bridwell; and Washington, D. C., No. 2059. Collection of the University of Kansas: Clarksville, Tenn., Aug. 8, 1915; Douglas Co., Kans., June 21, 1928, P. B. Lawson; Fulton, Miss., July 14, 1930, R. H. Beamer; Prattsburg, Ga., July 25, 1930, L. D. Tuthill.

Bandara aurata (Ball)

Eulellix (Mesamia) aurata Ball, Can. Ent. 41: 81–2, 1909.

This small golden species was described from a single female from Washington, D. C. It differs from other *Bandara* species in that the elytra are unicolorous. In some specimens examined, particularly in males, the dark coloring of the head is very pronounced.

Female.—Last ventral segment long, triangular, longitudinal carina at middle, gradually produced from lateral margins to small rounded lobe at middle.

Male.—Valve short, blunt, triangular; plates long, slender, narrow on outer half; pygofer short, stout, with a weak spine on ventral margin extending well beyond pygofer and curved in slightly. Styles with apices notched, inner lobe produced finger-like; aedeagus with base almost square, shaft very long, narrow, curved evenly forming a large, more than complete semi-circle, apex divided into two long divergent spines, apices extending beyond base in lateral view.

Length: Male, 4–4.25 mm.; female, 4.5 mm.

In The Ohio State University Collection: Licking Co., O., Aug. 5, H. Osborn; Franklin Co., O., Aug. 10, 1931, E. P. Breakey, *Acer*; Carolinas, June 19, 1928, D. M. DeLong; Durant, Miss., June 10, 1934, D. W. Grimes, *Crataegus*.

INSECT DIETARY, by CHARLES T. BRUES. pp. xxvi+466, 22 plates, 68 text figures. The Harvard University Press, 1945. Price \$5.00.

The name of the author is advance notice of the comprehensiveness of his work. Although it is not a large volume in actual bulk, it covers an incredible amount of factual material in extremely readable form—readable, that is, to a biologist. The reviewer, at least, suspects that the layman might bog down in its uninhibited scientific vocabulary, although he should appreciate from one point of view or another such items as the comparison of a rigidly monophagous insect to a "teetotaler who would die of thirst in the midst of aqueous liquids defiled by the taint of one-half percent alcohol."

It would be futile to attempt a summary of the contents of such a book. Its chapters cover a survey of the abundance and diversity of insects, types of food habits and their relation to structure and environment, herbivorous insects, gall insects, fungi and microbes as food and symbiosis with microorganisms, predatory insects, parasitism, external parasites, internal parasites and insects as food. Each chapter has an ample bibliography and the book concludes with separate indices to authors and subjects.

The writer shows in his foreword a nice appreciation of trends in biological science, expressed with such facility that it lightens the end of a busy day. A small example says that "Entomologists can speak with fervor of the intricacies of taxonomic investigation. Among all biologists, they seem to have made the worst mess of it, characterizing so many families, genera and species that they have far outstripped the whole field of their taxonomist brethren. This is not really their fault; it is merely a feeble attempt to sort out the avalanche of insects that Nature has lavished on the Earth." But read it yourself. However much you may know about insects you are sure to learn a lot more and learn it with enjoyment if terms like monophagous and oligophagous and hypogaecic do not disturb the serenity of your reading.—A. W. L.