

REVISION OF THE GENUS *ARUNTA* DISTANT
CICADIDAE, CICADINAE, DIVISION THOPHARIA
HOMOPTERA—HEMIPTERA.

By *A. N. Burns, M.Sc., F.R.E.S., Curator of Insects,
National Museum of Victoria.*

Plate M1, Figure M2.

ABSTRACT.

The Australian genus *Arunta* Distant (1904) contains three species, two of which, prior to 1904, were included in the genus *Thopha*, the third species being added by Distant in 1921. Until 1904 the genus *Thopha* contained six species, but in his "Rhyncotal Notes" (Homoptera), Distant erected the genus *Arunta* to include two species which he considered showed characters diverse enough to be included in a new genus. The writer has studied carefully the characters shown by Distant, and to them has added further structural differences in support. It should be pointed out that species of both *Thopha* and *Arunta* are large insects bearing a strong superficial resemblance to one another; both genera are included in the Division *Thopharia* which is characterized by the immensity of the tympanal sacs, small operculae, and truncate lateral margins of the pronotum.

INTRODUCTION.

The cicadas belonging to this genus are confined to the eastern coastal region of Australia, two species (*A. perulata* and *A. interclusa*) occur in New South Wales and Queensland, the third species (*A. intermedia*) is confined to far northern Queensland. The writer has no experience of the latter species in the field, but *A. perulata* which ranges from a little over a hundred miles south of Sydney to 250 miles north of the Tropic of Capricorn at least, inhabits different species of trees on which it occurs at heights usually more than six feet from the ground. *A. interclusa* ranges from the northern rivers of New South Wales to northern Queensland as far as Kuranda at least, and in the writer's experience almost invariably occurs on mangrove trees fringing estuaries, and at an average height of six feet from the ground. Its song is not loud but is audible at a considerable distance. *A. intermedia* appears to be found only in far northern Queensland on Cape York Peninsula. Ashton (1921) in his description of this cicada states, "One male and two females in Coll. H. Ashton, collected by H. Elgner, 1906."



10 MM

PLATE 1.
Blepegenes cicatricosa, sp. nov. ♀ paratype.

As already indicated, species of *Arunta* are very similar in appearance to species of *Thopha*; the principal differences between the two genera may be summarized as follows:—

Thopha: Head, including eyes, wider than the pronotum the width of which equals length of pro. and mesonotum (incl. cruciform elevation). Tympanal sacs extending to half the length of the abdomen; frons weakly grooved medianally and longitudinally in upper half, transverse ridges 14 in number.

Arunta: Head only slightly wider than the pronotum, the width of which is less than length of pro. and mesonotum (incl. cruciform elevation). Tympanal sacs extending to two thirds of the length of the abdomen; frons widely and strongly grooved medianally and longitudinally from vertex almost to clypeus, transverse ridges 10 in number.

SUMMARY OF EXTERNAL MORPHOLOGY.

General: Large insects with stout bodies of which the length is two and a half times the width; anterior wings approximately one and a third times body length. Body brownish or yellowish brown marked with green; tympanal sacs in *A. perulata* and *A. interclusa* densely covered with white tomentum, not so in *A. intermedia*. Wings clear vitreous. Head sculptured, lightly and finely pubescent, its width (including eyes) slightly more than three times its length, weakly trilobed, almost truncate; ocelli close together and almost equidistant; frons obtusely convex, grooved in front, rostrum extending to middle coxae. Thorax with width of pronotum slightly more than twice its length, sculptured, two sulci on either side of median, posterior margin well developed; mesonotum almost smooth, cruciform elevation only moderately developed, almost flat apically, metanotum visible dorsally as a narrow band. Anterior femora fairly strongly developed, bearing two moderately large spines. Posterior tibiae normally with six or seven spines. Length of anterior wings slightly more than three times their width; of posterior wings, twice their width. Abdomen smooth, pubescent along intersegmental margins; operculae very small, exterior margins curved outwards; tympanal sacs extending laterally to the fifth abdominal segment. Measurements of each species are given with its description. Individual label data is omitted in *A. perulata* and *A. interclusa* which normally are common species.

Key to the species of *Arunta*.

1. Wings clear vitreous, ocelli almost equidistant; head greenish yellow with dark markings, tympanal sacs extending laterally to the fifth abdominal segment 2
2. (1) Anterior wings with brownish infuscation bordering cross veins between R3 and R4 + 5, and R4 + 5 and MI; legs creamy yellow with brownish black markings, most extensive on anterior pair *perulata*
 Anterior wings without infuscation bordering cross veins as in *perulata*, legs creamy yellow with obscure pale brown markings. . . 3

3. (I) Head and thorax greenish yellow with brown markings, ocelli pale lemon vitreous, cruciform elevation pale yellowish green
interclusa
 Tympanal sacs and ventral area of thorax and abdomen not invested with white tomentum 4
4. (I) Anterior wings with pale infuscation bordering cross veins between R3 and R4 + 5, and R4 + 5 and MI, pronotum reddish
intermedia

Arunta perulata (Guèrin).

Cicada perulata Guèrin, 1830.—*Voy. Coquille*, Zool., 2: 180, pl. 10, figs. 5, 5A.

Thopha perulata Amyot and Serville, 1843.—*Hist. Hemip.*: 471.

Henicopsaltria perulata Goding and Froggatt, 1904.—*Proc. Linn. Soc. N.S.W.*, 29: 575.

Arunta perulata Distant, 1904.—*Ann. Mag. Nat. Hist.*, (7) 14: 302.

Arunta perulata Distant, 1906.—*Syn. Cat. Hom. I.*: 27.

Cicada perulata Froggatt, 1907.—“*Australian Insects*”: 349.

Arunta perulata Distant, 1912.—*Gen. Ins.* 142: 21, pl. 2, figs. 18A, 18B, 18C.

Arunta perulata Ashton, 1914.—*Trans. roy. Soc. S. Aust.*, 38: 346.

Arunta perulata Ashton, 1921.—*Proc. roy. Soc. Vict.*, (N.S.), 33: 90.

A common species in some years in coastal New South Wales and southern Queensland. In the former State it is recorded from as far south as Conjola, 105 miles south of Sydney, and in Queensland as far north as Bowen, North Queensland. It is apparently much rarer in the north of that State inasmuch as the writer lived and collected for several years at Cairns, Mackay, and near Rockhampton but did not encounter this species. *A. perulata* is essentially a mid-summer insect, being found during December and January. Males appear to be considerably more numerous than females, and the species frequents various kinds of trees and at a height usually greater than eight feet from the ground.

Average body length, male, 37.5 mm., + 2.5 mm. — 4.0 mm.; female, 37.2 mm., + 2.5 mm. — 4.2 mm.

Head: Greenish yellow marked with dark reddish brown and invested with pale golden pubescence which is densest in depressed areas; very slightly wider than pronotum and with a sulcus on either side of median just exterior to each

lateral ocellus. Vertex of frons dark reddish brown with a yellowish green median groove which extends down the front as far as the clypeus. Ocelli greenish yellow vitreous, almost equidistant; anterior in line with fore margin of eyes. Antennae dark brownish black. Frons (excepting vertex) yellowish green, the interstitial grooves fairly densely invested with pale golden pubescence. Transverse ridges ten in number, well and evenly defined; clypeus black with lateral margins sometimes narrowly greenish, thickly covered with pale golden pubescence, two thirds length of frons; labrum pale yellowish green, smooth, planate laterally; labium pale yellowish green with a dark median longitudinal very narrow groove anteriorly; genae pale yellowish green with a large dark brown central marking varying in size in individuals, and covered with long pale golden pubescence. Eyes opalescent dark reddish brown, orbits fringed with pale golden pubescence.

Thorax: Width (average) 15.5 mm., dark reddish brown; pronotum with three deep sulci on each side of median; a median greenish yellow longitudinal marking extends from anterior margin for three quarters of length; posterior marginal band reddish brown, transverse, striate; exterior margins finely carinate. Mesonotum dark reddish brown, a small triangular darker brown marking on either side of median anteriorly; lateral margins fringed with pale golden pubescence; cruciform elevation slightly paler reddish brown tinged yellowish green, its anterior depression with golden pubescence posterior with pale golden. Anterior portion of metasternum with a shining black area on each side of median. Metanotum pale yellowish green, transverse, almost linear, densely clothed with pale golden pubescence.

Wings: Anterior, average length, male, 49.7 mm., width, 15.9 mm., female, 48.4 mm., 15 mm. Clear vitreous, veins reddish brown, area between C and R, R and R₂, yellowish green; cross veins between R₃ and R₄ + 5, R₄ + 5 and M₁ and in their angles, bordered infusate brown; cell at base between R and Cu₂ yellowish green in basal half. Posterior, average length, male, 28.5 mm., width, 15.2 mm., female, 28.7 mm., 15.2 mm. Clear vitreous, veins pale yellowish brown, anal cell opalescent white excepting apical portion; veins 1A, 2A, also margined opalescent white, widest basally. Legs yellowish green with dark brown and dull black markings, most extensive on anterior pair; moderately clothed with very fine pale golden (almost silvery) pubescence. Anterior pair with tibiae and tarsi, middle pair with distal of tibiae and tarsi, dark brown; posterior tibiae and tarsi (excepting terminal claws), pale yellowish green. Anterior femora with two brownish sharp pointed spines of which the anterior is the larger; posterior tibiae normally with six brown spines, three along inner and three along outer sides; on the latter the first just anterior to half way, the other two close together near distal, on the former the first at one third, others equidistantly spaced between it and distal. This is a variable character, but most constant in males; some however exhibit four spines on the inner row. Females frequently have three spines on the outer row and four on the inner, very rarely five. Occasionally specimens are found in which the total number of spines differs on each posterior tibia.

Abdomen: Dark brownish red with greenish suffusion across posterior margins of segments, lightly pubescent, last two or sometimes three, segments with white tomentum. Tympanal sacs white, extending laterally to fifth abdominal segment; opercula small, white, interior margins widely separated, interior angles rounded, exterior openly so. Underside of abdomen greenish yellow with median areas of segments black; lateral expansions covered with

white tomentum. In the female the dorso-lateral and lateral areas of the first two abdominal segments are covered with white tomentum, and the black areas on the ventral surface are more restricted. Specimens from Rockhampton and Bowen are slightly smaller than those from southern Queensland and New South Wales and are lighter in colour, and show less infuscation bordering the cross veins in the anterior wings.

Type?

Arunta interclusa (Walker).

Thopha n. sp. Walker, 1851.—*List Hom. Br. Mus.*, Pl. 1, fig. 6.

Thopha interclusa Walker, 1858.—*Ibid.* Suppl.: 5.

Henicopsaltria interclusa Stål, 1866.—*Berl. Ent. Zeitschr.*, 10: 171.

Henicopsaltria interclusa Goding and Froggatt, 1904.—*Proc. Linn. Soc. N.S.W.*, 29: 576.

Arunta interclusa Distant, 1906.—*Syn. Cat. Hom.*, I.: 27.

Arunta flava Ashton, 1912.—*Rec. Aust. Mus.*, 9; 76, Pl. 7, figs. 1-2.

Arunta interclusa Distant, 1912.—*Proc. Linn. Soc. N.S.W.*, 37: 600.

Arunta interclusa Ashton, 1914.—*Trans. Roy. Soc. S. Aust.*, 38: 346.

Arunta interclusa Ashton, 1921.—*Proc. Roy. Soc. Vict.*, (N.S.), 33: 90.

This pretty species is more local than *perulata*, and much more abundant in some seasons than others. From information supplied, and in the writer's experience, it is found nearly always on Mangrove trees, rarely on other trees growing amongst Mangroves along the fringes of estuaries where tidal influence is felt. At Mackay, North Queensland, the writer captured specimens from Mangrove trees which at full tide had at least two feet of water covering their roots. It is an easy insect to capture, and usually rests at from six to eight feet from the ground. Females are very much scarcer than males, the ratio being about 40 males for every female captured. *A. interclusa* is confined to the tropical and sub-tropical estuarine areas of northern New South Wales and Queensland, the range (in the writer's experience) being from the Richmond River in the former State to Mackay, Queensland. A single specimen (female) from Kuranda N.Q., in the collection of the S.A. Museum, was examined by the writer. It would not be collected from Mangroves as they do not occur there, the nearest being about four miles distant in a straight line.

Average Body Length: Male, 30.5 mm. + 2.0 mm., = 3.2 mm., female 29.5 mm. + 1.5 mm. — 3.0 mm.

Head: Greenish yellow with dull black markings and silvery pubescence in depressions; slightly wider than pronotum; a median groove from anterior ocellus to posterior margin, and another shallow groove exterior to each lateral ocellus. Vertex of frons black with a shallow median groove which opens out into a wide groove extending down the front of the frons to the clypeus. Ocelli greenish-orange vitreous, almost equidistant, anterior in line with fore margin of eyes. Antennae black. Frons, (excepting vertex) greenish yellow suffused brownish; median groove and furrows between transverse ridges invested with silvery pubescence; ridges ten in number, clearly defined. Clypeus yellowish green with basal portion dark brown, clothed with silvery pubescence. Labrum yellowish green; labium yellowish green, very finely grooved longitudinally, brown, apex brownish. Genae black with exterior margins yellowish green; carinate, thickly invested with long silvery pubescence. Eyes opalescent reddish brown, orbits fringed with silvery pubescence.

Thorax: Width, (average) 14 mm., yellowish green, sculptured; pronotum with two blackish sulci on either side of median, a slightly lighter coloured median patch bordered black extending from anterior margin for three quarters of length; posterior marginal band wide, greenish yellow, transverse, very finely striate; exterior margins slightly paler in colour. Mesonotum yellowish green, a small triangular blackish patch, edged light brown, on each side of median anteriorly, exterior to these a much larger similarly coloured patch extending to two thirds; a median black marking arising between the two small dorsal patches and extending to anterior face of cruciform elevation; this, and lateral margins clothed with silvery pubescence. Cruciform elevation pale yellowish green; smooth apically and with a minute longitudinal groove along its apex. Anterior portion of mesonotum with a brownish area on each side of median. Metanotum pale yellowish green, almost linear, finely silvery pubescent.

Wings: Anterior, average length, male, 40.4 mm., width, 13.6 mm., female, 38 mm., 14.25 mm. Clear vitreous, veins greenish yellow, area between C and R, R and R₂, greenish; cell at base between R and Cu₂ greenish in basal half. Posterior, average length, male, 23.8 mm., width, 12.5 mm., female, 22 mm., 11.7 mm. Clear vitreous, veins greenish yellow, 3A, 2A, and basal portion of Cu₁ edged opalescent greenish white, 3A broadly so basally, others less so. Legs, pale yellowish green, clothed with very fine silvery pubescence; anterior tibiae and tarsi brownish, middle and posterior femora suffused brownish, terminal claws black. Anterior femora with two small sharp teeth, the distal longest and tipped black. Posterior tibiae normally with six spines; three on the outer side, the first at half way, others equidistant to distal; three on the inner side, the first at one quarter, others almost equidistant to distal. As in the preceding species this character is variable and specimens of both sexes may exhibit three spines on the outer row and four on the inner. Rarely individuals are met with in which the total number of spines differs on each posterior tibia.

Abdomen: Black with posterior margins of segments greenish yellow and silvery pubescent; terminal segments suffused greenish, pre-apical segment thickly tomentose white. Tympanal sacs pure white, extending laterally to fifth abdominal segment; operculae small, recurved outwards; interior margins widely separated, interior angles rounded; exterior openly so. Underside of

abdomen greenish yellow with median areas of segments black; lateral expansions and segmental margins silvery pubescent. In the female the abdomen is greenish brown densely overlaid with silvery pubescence; underside as in the male but lighter in colour.

Type, Brit. Mus.

Type of *A. flava* Ashton, Aust. Mus.

ARUNTA INTERMEDIA Ashton.

Arunta intermedia Ashton, 1921, Proc. Roy. Soc. Viet., 33: 91.

Apparently three specimens only (one male and two females) of this species have been collected, taken on Cape York Peninsula by the late H. G. Elgner. These specimens were included in the Howard Ashton collection which is now in the Australian Museum, Sydney. Unfortunately much of the material in this valuable collection was destroyed before it was received by the Australian Museum, and the single male and one female of this species were lost. Through the courtesy of Dr. Evans and the late Mr. Musgrave of the above Museum, I have been privileged to study the single remaining female.

Body length: 34.5 mm.

Head: Greenish yellow with black frontal markings and fine pale golden pubescence densest in depressions; slightly wider than pronotum, vertex with a median "V" shaped groove from anterior ocellus to posterior margin; exterior to each lateral ocellus another groove extending almost from posterior margin to the frons. Vertex of frons black with pale golden pubescence, deeply cleft medianally from posterior margin to clypeus. Ocelli yellowish orange vitreous, almost equidistant, anterior behind anterior margin of eyes. First antennal segment brownish black, remaining segments missing from specimen. Frons (excepting vertex) yellowish brown suffused greenish darkening to brown in front; with ten well defined transverse ridges invested with pale golden pubescence. Clypeus brownish shading to brownish yellow near labium, pale golden pubescent; slightly keeled medianally and longitudinally, devoid of pubescence on keel. Labrum yellowish, grooved longitudinally; labium yellowish, shading to brownish yellow at apex, grooved longitudinally. Genae densely covered with pale golden pubescence completely excluding basal colouration. Eyes opalescent reddish brown; orbits pale golden, pubescent posteriorly.

Thorax: Width 13.5 mm., brownish yellow with black markings, not strongly sculptured; pronotum with two black sulci on either side of midline, a lighter median patch bordered black from anterior margin to three quarters, posterior marginal band finely striate transversely, paler in colour. Mesonotum yellowish brown, tinged greenish, pale golden pubescent along anterior and lateral margins; a small triangular black marking on each side of midline anteriorly, another interrupted black patch broadest anteriorly on each side and extending as far as cruciform elevation; a median narrow black marking from near anterior margin to cruciform elevation; the latter yellowish green, smooth, pale golden pubescent in anterior and lateral depressions. Metanotum yellowish green with pale golden pubescence.

Wings: Anterior, length, 45 mm., width, 14 mm., clear vitreous with all veins brownish yellow; cross veins between R3, R4 + 5, and MI edged pale brown infuscation; basal cell partly infuscate yellowish. Posterior, length 23 mm., width, 12.5 mm., clear vitreous, all veins yellowish brown excepting 3A which is dark brown; this and 2A basally bordered white. Legs yellowish green with brownish markings on distal portion of femora; tarsi brownish yellow, terminal claws (where present) tipped black. Posterior tibiae with eight spines; three on outer side, of which two are near distal and the other very small at one third; five on inner side, first opposite anterior small spine of outer side, second just before half way, third just beyond, fourth and fifth close together near distal. Anterior femora with two small sharp teeth; anterior the larger, directed forwards, posterior darker, directed outwards. *Abdomen*: Yellowish brown with pale golden pubescence, a black marking on each side of terminal segment. Underside paler, segment 5—8 each with a central black marking.

Syntype: Australian Museum, Sydney.

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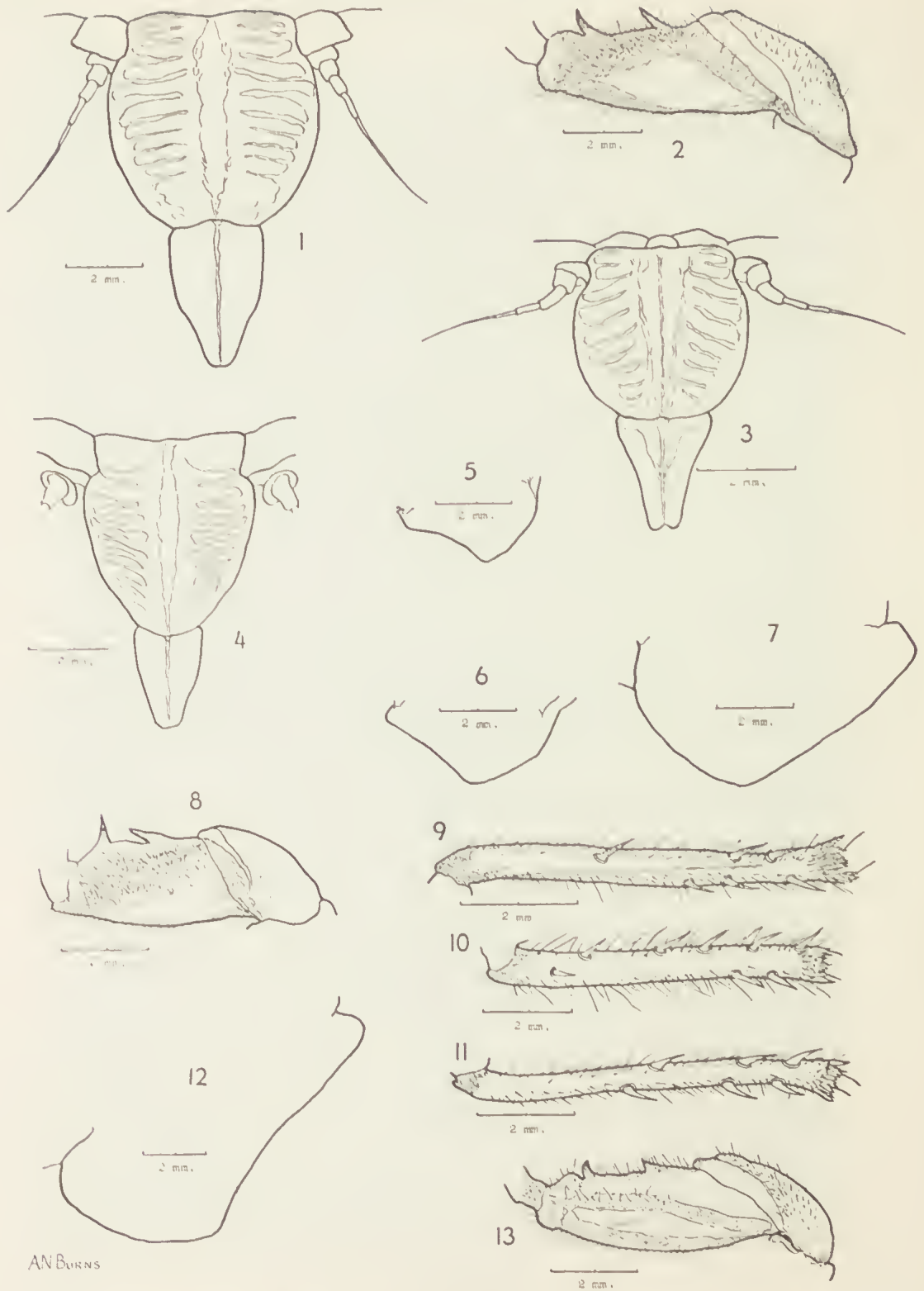
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PLATE I.

- FIG. 1.—*Arunta interclusa*, male.
2.—*Arunta interclusa*, female.
3.—*Arunta intermedia*, female.
4.—*Arunta perulata*, male.



ANBURNS

PLATE 2.

FIG. 1.—*Arunta perulata* (male), frons.
 2.—*Arunta perulata* (male), anterior femur.
 3.—*Arunta interclusa* (male), frons.
 4.—*Arunta intermedia* (female), frons.
 5.—*Arunta intermedia* (female), operculum.
 6.—*Arunta intermedia* (female), operculum.
 7.—*Arunta interclusa* (male), operculum.

FIG. 8.—*Arunta intermedia* (female), anterior femur.
 9.—*Arunta perulata* (male), posterior tibia.
 10.—*Arunta intermedia* (female), posterior tibia.
 11.—*Arunta interclusa* (male), posterior tibia.
 12.—*Arunta perulata* (male), operculum.
 13.—*Arunta interclusa* (male), anterior femur.