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in North America

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The Genus *Arundanus* (Homoptera-Cicadellidae) in North America

Dwight M. DeLong

A previous paper¹ by the author in 1935 established the genus *Arundanus* to include a group of species previously described in *Thamnotettix* and *Chlorotettix* and collected from species of cane, *Arundinaria*. At that time several species were known from only one sex, particularly the female and in several cases the males were not available for obtaining diagnostic characters. Since that time the writer has had an opportunity to obtain a considerable amount of material from the Carolinas and certain of the Gulf Coast states. It has been possible to obtain an abundance of material of most of the species described and to thus complete a study of the male genital structures. The illustration of these characters will serve to assist others in the identification of these species.

The species of *Arundanus* are confined by the distribution of their specific food plants to the southeastern United States, and certain of them are apparently further limited in their distribution within that range. With few exceptions the eastern coastal species of the Carolinas seem to be different from those found in the areas occupied by the western range of this plant in Tennessee, Kentucky, southern Illinois and Mississippi. This difference in specific distribution may be due to specific differences of the *Arundinaria* or to climatic factors alone.

The first species of this group described, *A. shermani* (Ball), was from a single female specimen and no male has since been found which seems to belong to this species. Two distinct species of males have recently been collected, either of which might have been placed with this female. The fact that each has accompanying females neither of which quite agree with *shermani* leaves the decision almost impossible at this time and both species are being described in the present treatment since it may prove to be that neither of these is the male of *shermani*.

KEY TO SPECIES

- | | |
|---|-------------------|
| 1 Vertex marked with dark transverse bands or spots below or above margin,
or both | 2 |
| 1' Vertex without dark bands or spots bordering margin | 13 |
| 2 Without a distinct dark band below vertex margin, marked above with distinct
spots | 3 |
| 2' With a distinct band below vertex margin | 4 |
| 3 Vertex strongly produced, marked with four distinct spots above margin..... | <i>arundineus</i> |

¹ De Long, D. M. Ent. News 46:180. 1935.

- 3' More bluntly angled, with four spots just above margin and a larger pair just posterior to marginal spots *duplus*
- 4 Markings above vertex margin forming a regular or irregular dark band, spots when present elongate and usually connected 5
- 4' Marking above vertex in form of separate spots 11
- 5 Vertex strongly produced and angled, spots distinctly triangular, the pair at center with base of triangle either side of and parallel to median line..... *proprius*
- 5' Spots above vertex not distinctly triangular, usually rounded on margin along median line 6
- 6 Female last ventral segment appearing truncate, male where known with aedeagus with bifid pointed apex or with a pair of long spearhead pointed apices..... 7
- 6' Female last ventral segment produced, trilobate or excavated, male aedeagus either broadened near apex with a pair of separated converging processes or with a broad blade on dorsal portion 9
- 7 Vertex broad appearing almost rounded, line above vertex composed of elongated spots. Male not known *shermani*
- 7' Vertex appearing more angularly produced, line above margin usually more uniform 8
- 8 Male aedeagus in ventral view tapered at apex to a bifid pointed tip..... *fastigatus*
- 8' Male aedeagus in ventral view divided near middle and produced forming a pair of long curved separated terminal process which cross at apex and have "spearhead formed" tips *sarissus*
- 9 Female segment excavated with a small median sunken tooth. Male dorsal portion of aedagus broad and blade-like *carolinus*
- 9' Female segment produced or lobate. Male dorsal aedeagus with narrow spine-like processes 10
- 10 Female segment strongly produced at center forming a broad produced lobe beyond lateral angles. Male aedeagus with short terminal processes beyond broadened portion *latidens*
- 10' Female segment trilobate, male aedeagus less broadened near apex, with longer terminal processes, long terminal processes of styles and with longer spine-like processes on the dorsal portion of aedeagus *marginellus*
- 11 Small, not exceeding 4.5 mm. in length, a narrow brown line beneath vertex margin curved around ocelli on outer margins and with four spots above margin *parvulus*
- 11' Larger, 5 mm. or more in length, band beneath margin heavier not curved around ocelli 12
- 12 With conspicuous longitudinal orange bands on vertex and pronotum. Vertex with a pair of longitudinal dark dashes at terminus of these bands above margin *rubralineus*
- 12' Without conspicuous longitudinal orange bands on vertex and pronotum with four small dark spots above margin *crumbi*
- 13 Apex rather pointedly produced, without orange longitudinal bands on vertex and pronotum 14
- 13' Apex more bluntly angled, conspicuously marked with longitudinal orange bands on vertex and pronotum 15
- 14 Male uniformly orange in color, female uniform milk white. Female segment with produced membrane which is deeply broadly notched at center. Male with a short broad blunt ventral aedeagus and a pair of long blade-like structures on the dorsal aedeagus which are pointed at apex *nacreosus*
- 14' Male and female yellow tinged with orange. Female segment broadly shallowly excavated with a slight U-shaped notch at center. Male ventral aedeagus with a pair of proximal pointed teeth at apex. Dorsal aedeagus broad curved upward and with a broad blunt apex *flavotinctus*
- 15 Female segment truncate deeply narrowly incised at middle *rubralineus*
- 15' Female segment deeply broadly excavated with median incision..... *var. excavatus*

***Arundanus duplus* n. sp.**

Superficially resembling *crumbi* in coloration but with a pair of black spots behind the row above anterior margin. Length 4.5 mm.

Vertex produced, bluntly angled, as long at middle as basal width between eyes.

Color dull yellow, vertex with a row of four black spots between ocelli just above margin, the middle pair the larger. A large spot behind these on each side of middle and in a line with the anterior margins of the eyes. Two longitudinal orange brown stripes on vertex, six on pronotum. Elytra brownish with pale veins.

Genitalia: Male plates rather long, bluntly pointed, slightly concave on outer margins. Styles with short outwardly curved apical process. Aedeagus in lateral view broadened at middle, narrowed toward apex with the apical third bent abruptly dorsally, anterior margin slightly produced just before narrowed, bluntly pointed apex.

The styles resemble those of the species of *Graminella* but the venation and external appearance are more typical of species of *Arundanus*.

Holotype male collected at Fulton, Mississippi, June 15, 1933, by D. W. Grimes.

Arundanus arundineus DeLong

Arundanus arundineus DeLong, Trans. Amer. Ent. Soc. 52:91, 1926.

Resembling *proprius* in coloration but with spots above pale margin, smaller, not contiguous and without a dark band beneath the pale margin.

Vertex bluntly angled, about one-fourth wider between eyes at base than median length.

Genitalia: Female last ventral segment deeply rounded notched on median half. Male aedeagus with the ventral portion rather short and curved dorsally at the apex forming a blunt tip. Dorsal portion extending from base, longer than ventral portion, slightly enlarged at apex which is truncate and serrate.

Known only from Tennessee, Illinois and Kentucky.

Arundanus proprius (DeLong)

Thamnotettix proprius DeLong, Ohio Jour. Sci. 18:238, 1918.

In coloration more closely resembling *shermani* but with a strongly produced, angled vertex. The vertex margin is pale, bordered beneath by a uniform black band and above by a band composed of three large triangular spots. The central pair are largest and decidedly separated.

Vertex a little wider between eyes at base than median length.

Genitalia: Male plates long and narrow, bluntly pointed. Aedeagus in lateral view curved dorsally at apex and enlarged into a half spearhead, the enlargement being on the caudal margin. Style with a short, outwardly curved, apical process.

This species is known only from the holotype male which is unique in both color markings and male genital structures and was collected in Tennessee.

Arundanus shermani (Ball)

Thamnotettix shermani Ball, Can. Ent. **35**:230, 1903.

This is a broad headed species with a pale marginal band bordered by a narrow brown band beneath and an irregular dark band above, the latter composed of three triangular spots each side of middle.

Vertex broad, almost rounded at apex, one third wider between eyes at base than median length.

Genitalia: Female last ventral segment appearing truncate. The male of this species has not been definitely determined from material which has been examined.

Arundanus fastigatus n. sp.

Resembling *latidens* in general appearance but with vertex more produced and a more broken brown band above margin. Length 5.5 mm.

Vertex rather strongly produced and bluntly angled, a little wider between eyes at base than median length.

Color orange to brown, vertex margin white, bordered below by a narrow black line and above by a slightly broken or irregular brown line composed of elongated spots. Elytra smoky brown, veins paler.

Genitalia: Female last ventral segment truncate or sinuate. Male plates long, bluntly pointed. Styles with apical portions rather long, parallel margined, rounded at apex. Ventral portion of aedeagus pointed at apex and appearing bifid in ventral view. Dorsal portion with a short median, rather broad plate and a rather long process either side which is narrowed to form a long slender sharply pointed upturned apex.

Male holotype, female allotype and male and female paratypes from Carolina Beach, N. C., Jun 8 and 9, 1940, and Wilmington, N. C., Jun 9, 1940. Collected by Mr. and Mrs. George Wene and the writer.

Arundanus sarissus n. sp.

Resembling *latidens* in general appearance but with brown band above pale margin more broken and uneven. Length 4.5-5 mm.

Vertex bluntly angled, about one-third wider between eyes at base than median length.

Color orange-yellow, vertex margin white, bordered below by a black band, and above by a brown band which is formed by three contiguous elongated spots, the largest of which are either side of the interruption at the middle. Veins of elytra almost unicolorous, not conspicuous.

Genitalia: Female last ventral segment appearing truncate. Posterior margin roundedly excavated, the central portion of which is filled to the distance of the

lateral angles with what appears to be an underlying membrane. Male plates tapered to bluntly pointed apices. Styles with apical portions rather long, parallel margined, pointed on inner apical margin. Aedeagus with ventral portion branched at about half its length to form two long curved apical processes which are spear-like at their apices. The dorsal portion arises near the base and is composed of a short median process and a pair of long slender processes extending dorsally.

Male holotype, female allotype and male and female paratypes collected at Carolina Beach, N. C., June 8 and 9, 1940, and at Wilmington, N. C., June 9, 1940, by Mr. and Mrs. George Wene and the writer.

Arundanus carolinus DeLong

Arundanus carolinus DeLong, Ent. News 46:181, 1935.

Similar to *latidens* in markings and general appearance but with more produced head and distinct genitalia.

Vertex bluntly angularly produced, a little wider between the eyes than median length.

Color brown tinged with orange, vertex margin yellow, margined above and below with a wavy black line. The line above often broken into elongate dashes.

Genitalia: Female last ventral segment with posterior margin broadly concavely rounded with a short, broadly rounded produced tooth at center. Male aedeagus with apex curved dorsally. At the base a large dorsal portion arises which in lateral view is broad, blade-like, curved and broadened before the acutely pointed apex.

Known to occur only in North and South Carolina.

Arundanus latidens DeLong

Arundanus latidens DeLong, Ent. News 46:182, 1935.

A brownish species with a pale margin bordered above and below with a dark brown line. The band above is continuous but wavy and interrupted at middle.

Vertex broadly bluntly angled, about one-fourth wider between eyes at base than median length.

Genitalia: Female segment with a broad median produced tooth which is produced decidedly beyond the rounded lateral angles of the posterior segment. Male aedeagus in ventral view roundedly enlarged before apex with a pair of rather long narrow converging apical processes. In lateral view the aedeagus rounds at apex to a pointed tip. Near the base a short dorsal process arises with a pair of rather long slender spines protruding in the dorsal chamber. The apex of the style is short with a truncate tip which is slightly broadened.

This is a very common species in the North and South Carolina areas of *Arundinaria* but has not been collected in the other states where this food plant occurs.

Arundanus marginellus DeLong*Arundanus marginellus* DeLong, Ent. News **46**:181, 1935.

A broad headed species similar in form and appearance to *shermani* but with a trilobate female segment.

The vertex is orange in color. The margin is white with a black band just above and below. The band above is broader either side of middle then tapers to a very narrow line above ocelli. Veins of elytra white as in *shermani*.

Genitalia: Female last ventral segment with lateral angles produced and rounded, between which the posterior margin is excavated either side of a median produced tooth which is broad and often slightly bifid at apex, thus giving the posterior margin a trilobate appearance. Male styles with long parallel margined apices which are not broadened at apex as in *latidens*. Aedeagus similar to that of *latidens*, broadened before apex with two long spine like processes protruding at apex.

Known only from Tennessee, Illinois, and Clemson College, South Carolina (O. L. Cartwright).

This species is similar in structure to *latidens*. The male styles have longer apical structures and the aedeagus, although the same type, is less expanded just before apex and the apical pointed processes are decidedly longer. The paired elongated spurs on the dorsal portion of the aedeagus are also longer than the similar processes in *latidens*.

Arundanus parvulus DeLong*Arundanus parvulus* DeLong, Ent. News **46**:182, 1935.

A small orange colored species without definite color markings except a narrow pale waved marginal band between a narrow ventral marginal line, which is waved, and a few faint markings above margin, especially a pair of faint spots at middle and a faint spot next each ocellus.

Vertex bluntly angled about one-third wider between eyes than median length.

Genitalia: Female last ventral segment with posterior margin broadly, rather deeply concavely rounded. A produced membrane appears as a convexly rounded portion of the segment at middle. Male plates long slender, bluntly pointed at apex. Style with a long apical portion which is broadened at truncated apex. Aedeagus rather short and thick with apex enlarged and upturned. At the base is a short broad process extending dorsally with a long slender spine either side which extends caudally.

Allotype male collected at Carolina Beach, N. C., June 8, 1940, by the writer. Known only from North and South Carolina.

Arundanus crumbi (DeLong)*Thamnotettix crumbi* DeLong, Tenn. St. Bd. Ent. **17**:181, 1916.

In form and appearance resembling *flavotinctus* but with distinct color markings.

Vertex margin marked with a broad brown waved band and with four rounded almost equidistant brown spots between eyes just above margin. Vertex sharply angled about one-fourth wider between eyes than median length.

Genitalia: Female last ventral segment with posterior margin broadly angularly excavated, the apex of notch slightly rounded. Male plates long and narrow, bluntly pointed. Aedeagus in ventral view with ventral portion narrowed and forming two long-spine teeth. In lateral view narrowed to a sharp pointed apex. The dorsal portion is curved dorsally, being almost the same width throughout and truncate at apex.

Known from Tennessee and Illinois, where it occurs abundantly upon cane. It has been taken more recently at Clemson College, South Carolina, by Cartwright. It has not been collected on the low coastal plain.

Arundanus flavotinctus (DeLong)

Thamnotettix flavotinctus DeLong, Tenn. St. Bd. Ent. Bull. 17:821, 1914.

With a sharply angled vertex, one-fourth wider between eyes than median length, orange-yellow with very faint if any color markings.

Genitalia: Female last ventral segment shallowly rounded, notched on median half. Lateral angles broadly rounded. Male plates long and slender, rounded at apices. Styles with rather long almost parallel margined apical portions which are divergent and enlarged on inner margins at apex. Aedeagus with ventral portion narrowed at apex to form a pointed tip in lateral view, or an apex with a pair of long spine-like teeth in ventral view. Dorsal portion of aedeagus broad, bent abruptly dorsally at about half its length, broadened and with a blunt serrate apex.

Known only from Tennessee and Illinois, and one specimen is at hand from Clemson College, South Carolina (Cartwright).

Arundanus rubralineus DeLong

Arundanus rubralineus DeLong, Ent. News 46:181, 1935.

Distinct in color with a broad, bluntly angled vertex, about one-fourth wider between eyes than median length. Margin of vertex usually not banded and usually without any dark markings. Vertex marked only by a pair of broad longitudinal orange-red stripes, occasionally a black line on margin. Elytra tinted with orange and with white stripes along claval area. Veins pale.

Genitalia: Female last ventral segment with posterior margin sinuately truncate or emarginate with a narrow incision at center extending two-thirds the distance to base. In one specimen this incision is widened to form a deep V-shaped notch. Male plates with broad bluntly rounded apices. Styles with long parallel margined apices which are two-thirds the length of the basal portion. Aedeagus with two portions. The ventral portion long, rather narrow and tapered to a pointed apex. The dorsal portion arising at the base is broader and narrowed near apex to a slender pointed apical process. This bears on the dorsal portion near the base a pair of long processes which extend dorsally.

Allotype male from Biloxi, Miss., collected June 11, 1933, by Mr. D. W. Grimes.

***Arundanus rubralineus* var. *excavatus* n. var.**

In color, form and appearance resembling *rubralineus* but with different female genitalia. Length 5 mm.

Vertex broadly, bluntly angled and with two longitudinal orange-red stripes on vertex.

Genitalia: Female last ventral segment with prominent lateral angles between which the posterior margin is broadly deeply excavated more than half way to base with a short V-shaped notch at middle of excavation, the apex of which is surrounded by a black spot.

Holotype female and paratype females collected at Fulton, Miss., by D. W. Grimes in June 1934.

Although the female segment appears entirely different from *rubralineus*, it is not possible to determine with the present material whether the female character is variable or if this may be a distinct species.

Arundanus nacreosus (Crumb)

Chlorotettix nacreosus Crumb, Anns. Ent. Soc. Amer. 8:196, 1915.

Distinct in color with dimorphic sexual coloration. Male uniform orange and female milk white without definite color markings.

Vertex bluntly angled, one-third wider between eyes at base than median length.

Genitalia: Female last ventral segment appearing four lobed. The posterior margin is deeply roundedly notched at middle and either side of a pair of median roundedly produced lobes. Lateral angles produced forming the outer lobes. Male plates short, apices blunt, rounded. Aedeagus with ventral portion short and broad, apex blunt in lateral view. Dorsal portion composed of a pair of long blade-like processes which exceed both plates and pygoferes.

Known only from Tennessee, Illinois and Kentucky, until recently when it was collected at Clemson College, South Carolina, by Cartwright. It apparently does not occur on the low coastal plain area of the Carolinas.

OHIO STATE UNIVERSITY,
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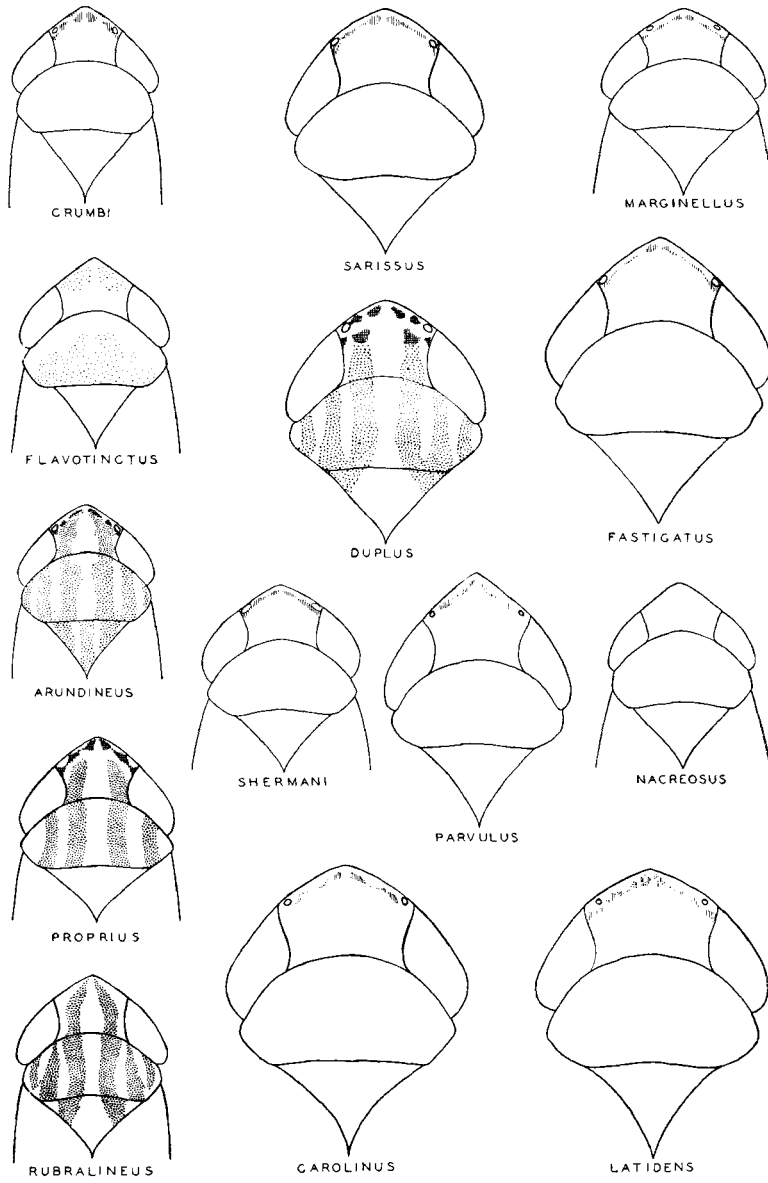


PLATE 1. Dorsal view of head and pronotum of species of *Arundanus* as named.

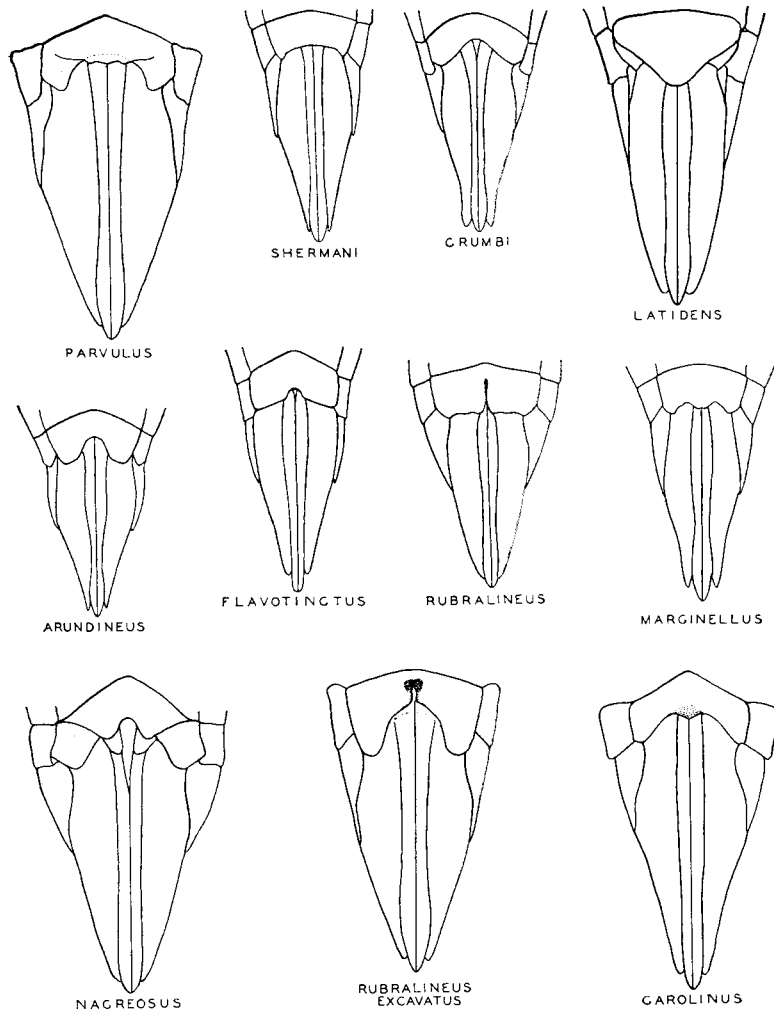
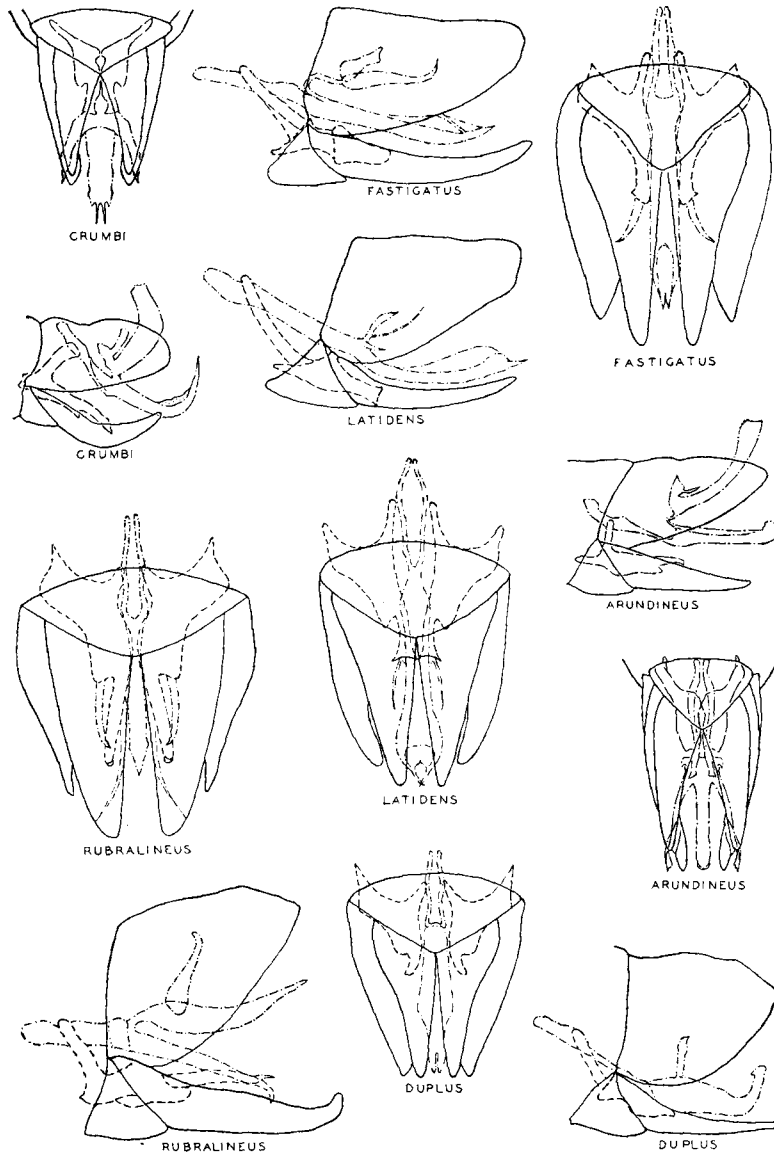
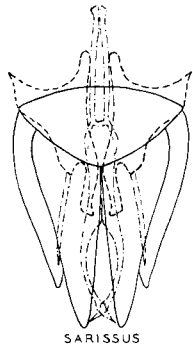


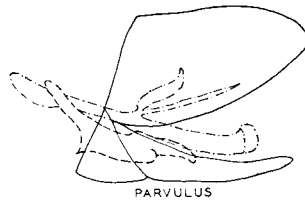
PLATE 2. Last ventral segments of females of species of *Arundanus* as named.



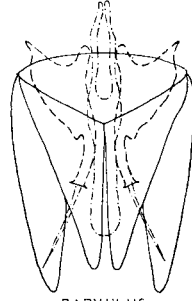
PLATES 3 and 4. Ventral and lateral views of the apical segments of the males of species of *Arundanus* as named, showing the genital structure in position.



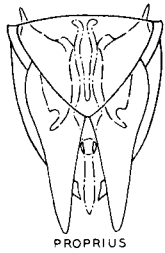
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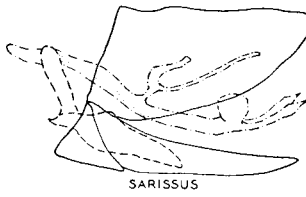
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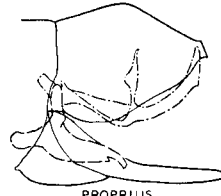
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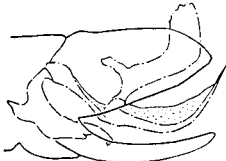
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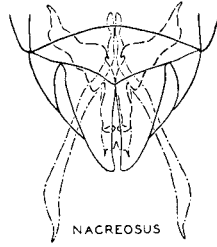
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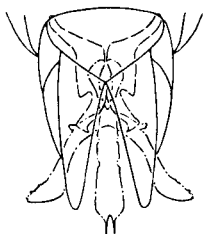
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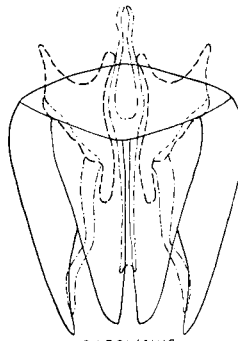
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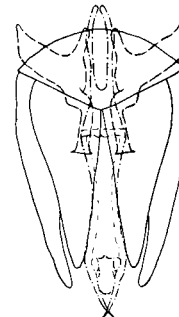
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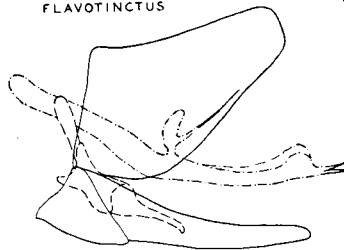
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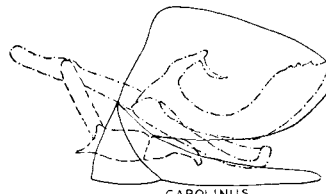
CAROLINUS



MARGINELLUS



MARGINELLUS



CAROLINUS