

MISCELLANEOUS PUBLICATION
OCCASIONAL PAPER NO. 16

Records of the Zoological Survey of India

DESCRIPTIONS OF A NEW GENUS AND SOME NEW
SPECIES OF MEMBRACIDAE (HOMOPTERA)
IN THE COLLECTIONS OF THE ZOOLOGICAL
SURVEY OF INDIA

by

K. S. ANANTHASUBRAMANIAN

Issued by The Director
Zoological Survey of India. Calcutta

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1980

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Pages 1-36

CONTENTS

	<i>Pages</i>
Genus <i>Oxyrhachis</i> Germar	1
Genus <i>Leptocentrus</i> Stal	9
Genus <i>Tricentrus</i> Stal	17
Genus <i>Gargara</i> Amyot & Serville	30
Genus <i>Gargarina</i> gen. nov.	33
Key to lettering of figures	35
Acknowledgements	36
References	36

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The membracids included in the present study are those collected during the last two decades by the Zoological Survey of India. Earlier collections of the Zoological Survey of India made by Annandale, Gravely and Kemp were studied by Funkhouser (1922). Thirtytwo new species and a new genus, *Gargarina*, are described in the present paper, and keys for the new species are given. Some of the species are represented by single specimens though they display differences sufficient enough to indicate their distinction. It is regrettable that many specimens in the collection which are mounted by gumming on card are not in good condition making diagnosis difficult. It is not out of place to mention here that the host plants of Indian membracids have seldom been recorded, as the distribution of the host plants may indicate the possible range of a species in this highly polymorphic group of insects.

Subfamily *OXYRHACHINAE* Haupt

Tribe OXYRHACHINI Distant

Genus *Oxyrhachis* Germar

KEY TO THE SPECIES

- | | | | | |
|------|---|-----|-----|-----------------------------|
| 1(6) | Posterior process never reaching tips of tegmina. | | | |
| 2(5) | Metopidium backwardly sloping to disc ; ocelli normal. | | | |
| 3(4) | Ocelli nearer to eyes than to each other and located on the centro-ocular line ; ventral keel of posterior process weakly serrate ; tegmina four times longer than wide. | ... | ... | <i>geniculata</i> n. sp. |
| 4(3) | Ocelli nearer to each other than to eyes and located above centro-ocular line ; ventral keel of posterior process finely serrate ; tegmina a little more than three times longer than wide. | ... | ... | <i>punctatus</i> n. sp. |
| 5(2) | Metopidium vertical ; ocelli large, equidistant from each other and from eyes ; ventral keel of posterior process strongly serrate ; tegmina 3. 5 times longer than wide. | ... | ... | <i>nigrodorsalis</i> n. sp. |
| 6(1) | Posterior process reaching tips of tegmina or extending beyond tegminal tips. | | | |

7(10)	Suprahumeral shorter than space between their bases.			
8(9)	Ocelli nearer to each other than to eyes and located above centro ocular line ; posterior process extending well beyond tips of tegmina ; tegmina 3. 5 times longer than wide ...	...	...	<i>haldari</i> n. sp.
9(8)	Ocelli nearer to eyes than to each other and located on the centro-ocular line ; posterior extending slightly beyond tips of tegmina ; tegmina 3 times longer than wide ...	...	...	<i>apicalis</i> n. sp.
10(7)	Suprahumerals as long as or longer than space between their bases.			
11(12)	Metopidium vertical, twice as wide as high ; ocelli nearer to eyes than to each other and located on the centro-ocular line ; suprahumeral much longer than space between their bases. ...	...	...	<i>grandis</i> n. sp.
12(11)	Metopidium obliquely sloping backwards, thrice as side as high, ocelli equidistant from each other and from eyes and located above the centro-ocular line ; suprahumeral as long as space between their bases. ...	...	...	<i>unicolor</i> n. sp.

***Oxyrhachis geniculata* n. sp.**

(Pls. I & II)

Female : General colour ochraceous brown. Head castaneous brown, nearly 1. 5 times as wide as long, very finely punctate with short adpressed silvery hairs, cranial callosities not conspicuous, upper margin of vertex subplanate, lateral margins of foliate lobes rectangularly rounded, inner angles acute ; eyes subglobose, pale white, ocelli succineous, convex, nearer to eyes than to each other and situated on the centro-ocular line, clypeus reddish, never extending below lower margins of foliate lobes, tip densely pilose, a little upturned and truncate, rostrum reaching upto bases of posterior coxae. Thorax reddish brown, strongly punctate, each puncture with a silvery hair ; metopidium backwardly sloping, densely pilose, twice as wide as high, supraocular callosities large, convex ; suprahumeral horns highly variable in their degree of development, in the type nearly as long as distance between their bases, viewed from front directed outwards and slightly upwards, viewed from above directed outwards and somewhat dorsoventrally compressed, tips blunt, reddish brown ; disc between horns weakly convex ; posterior process greyish brown, shallowly tectiform at base, slightly raised over gibba, lateral carinae dark brown, ventral keel weakly serrate, apex reddish slightly raised and never reaching the extremity of tegmina. Tegmina hyaline, nearly 4 times longer than wide, basal sixth coriaceous and punctate, veins reddish brown, 2nd apical cell more than half as long as 1st apical cell, 3rd discoidal cell with a cross vein in the type. Abdomen greyish brown with white hairs.

Measurements : Length from frontal margin to tip of posterior process 6.4 mm. , to tips of tegmina 7 mm. ; width across tips of horns 3.4 mm. , at humeral angles 2.7 mm. , at eyes 2.3 mm.

Male : Similar to female but slightly darker and smaller ; suprahumeral horns shorter or much reduced ; viewed from front, obliquely turned upwards, tips blunt, dark brown.

Measurements : Length from frontal margin to tips of posterior process 6.1 mm. , to tips of tegmina 6.6 mm. ; width across tips of horns 2.7 mm., at humeral angles 2.4 mm., at eyes 2 mm.

Fifth instar nymph : Dull ochraceous brown. Head greyish brown, nearly twice as wide as long, vertex slightly arcuate, cranial tubercles prominent, thorn-like with subacute tips ; eyes dark brown, ocelli succineous, nearer to each other than from eyes and located on the centro-ocular line ; frontoclypeus densely pilose, its tip extending below the lower margins of vertex, rostral tip reaching third abdominal segment. Pronotum ochraceous brown, metopidium convex, slanting backwards, supraocular callosities prominent, suprahumeral buds distinct ; pronotal anterior process robust, broad at base and obliquely projecting forwards and upwards making an angle of about 60 degrees ; pronotal posterior process nearly three-fourths as long as anterior process, extending upto the fourth abdominal segment, costal angles distinct ; abdomen excluding anal tube nearly as long as thorax ; abdominal segments 4 to 8 with short conical lateral lamellae directed backwards and beset with 4 or 5 short tuberculated spines ; anal tube shortly pilose, about one-fourth the body length ; genital rudiments conspicuous.

This highly polymorphic species is related to *minusculus* Ananthasub. & Ananthak. in the disposition of ocelli and posterior, process, but differs from it in the larger size and highly variable suprahumeral horns and posterior process.

Material examined : Female holotype, Z. S. I. Reg. No. 562/H15, male allotype, Z. S. I. Reg. No. 563/H15, Fifth instar nymph neponotype, Z. S. I. Reg. No. 604/H15—608/H15, Paratypes 2 females Z. S. I. Reg. No. 564/H15—574/H15 and 579/H15—603/H15 from Rajasthan, Jodhpur, 17-3-1961, coll. J. S. Purohit ; 15 females, 10 males, one 3rd instar, 2 fourth instar nymphs, 14-12-1956.

***Oxyrhachis nigrodorsalis* n. sp.**

(Pl. III)

Male : General colour black. Head fuscous brown, about two-thirds as long as wide, punctate with white hairs, upper margin of vertex more or less planate, lateral teeth vertical and narrow, foliate lobes laterally rectangular,

inner angles broadly acute; eyes subglobose, dull black; ocelli chocolate brown, very large, equidistant from each other and from eyes and situated on the centro-ocular line; clypeus laterally tomentose, tip truncate and longly pilose. Thorax with pronotum black, punctate with adpressed white pilosity; metopidium vertical, two times wider than high, frontal margin obumbrant; supraocular callosities moderately large, impunctate and almost bare; humeral angles short and subacute; suprahumeral horns somewhat flattened, tricarinate, shorter than distance between their bases, viewed from front directed upwards outwards, then slightly curved backwards, viewed from above directed outwards and backwards, planate; posterior process shallowly tectiform, broad at base, rising to a small punctate gibba behind disc, then strongly tectiform and rising in a gentle curve to apex which reaches the level of disc, apex acute and never reaches the apices of tegmina, ventral keel ampliate and strongly serrate, its depth nearly as half as dorsal ridge; propleural process very prominent, mesopleural process inconspicuous; tegmina subhyaline, 3.5 times as long as wide, basal sixth coriaceous, fuscous and punctate, veins dark brown, apical limb wide, 2nd apical cell small, less than half the length of 1st apical cell, 2nd and 3rd discoidal cells nearly equal in length. Abdomen black at sides and white tomentose below.

Measurements: Length from frontal margin to tips of tegmina 7.4 mm., to tips of posterior process 6.7 mm.; width across tips of suprahumeral horns 4.0 mm., at humeral angles 2.7 mm., at eyes 2.5 mm.

Female: unknown.

This species is closely related to the African species, *latipes*, (Buckton) in its general disposition of suprahumeral and posterior process, but differs in having large ocelli which are situated on the centro-ocular line and also in the nature of apical and discoidal cell of tegmina.

Material examined: Holotype Z. S. I. Reg. No. 615/15 male from Garh Shanker Forest, Baddowal Forest, Jaojan Hoshiarpur, Dehra Dun, 23-12-1962; coll. R. K. B.

***Oxyrhachis haldari* n. sp.**

(Pl. IV)

Female: General colour pale fuscous brown. Head nearly 1.5 times broader than long, granulate with adpressed golden pilosity, cranial callosities vestigial, lateral angles of foliate lobes laterally bluntly rectangulate, inner angles broadly acute, upper margin of vertex slightly arcuate, eyes dark brown, subglobose, ocelli reddish brown, closer to each other than from eyes and located above the centro-ocular line; frontoclypeus light brown, tip truncate and longly pilose; thorax pale fuscous brown, pronotum coarsely punctate,

metopidium obliquely directed backwards to disc, 1.75 times wider than high, disc moderately raised; supraocular callosities brown; suprahumeral horns short and broad, shorter than the space between their bases, as seen from above, flat horizontally laminate, as seen in front, directed laterally and gently curved apically, apex acute; humeral angles prominent, tips subacute; posterior process strongly tricarinate, the dorsal carination percurrent through the pronotum, posterior half moderately upwardly recurved and extends well beyond tegminal apices, ventral keel weakly serrate. Tegmina nearly 3.5 times longer than wide, subhyaline, veins castaneous, basal part coriaceous, fuscous brown, 2nd apical cell more than half as long as 1st apical cell, apical limbus moderately wide. Abdomen fuscous brown.

Measurements : Length from frontal margin to tip of posterior process 9 mm. , to tips of tegmina 8.2 mm. ; width across tips of suprahumeral horns 3.4 mm. , at humeral angles 2.7 mm., at eyes 2.3 mm.

Male : unknown.

This species is allied to *tarandus* Fabr. and *lefroyi* Dist. ; it shares with *tarandus* the general coloration and in the long posterior process which extends beyond the tips of tegmina ; it is related to *lefroyi* in the short broad suprahumeral horns which are flatly horizontally laminate, and apically recurved ; it differs from both *tarandus* and *lefroyi* in the position of the ocelli.

Material studied : Holotype Z. S. I. Reg. No. 614/H15 female from Maharashtra, Poona, 20-2-1961 ; coll. B. K. Haldar.

Oxyrhachis apicalis n. sp.

(Pl. V)

Female : General colour reddish brown. Head wider than long, greyish yellow, vertex weakly arcuate, subquadrate, coarsely punctate with short adpressed golden hairs ; cranial callosities prominent, lateral angles of foliate lobes first vertical and then acutely rounded ; eyes subglobose, reddish brown ; ocelli transparent, nearer to eyes than to each other and located on the centro-ocular line ; frontoclypeus light brown, lateral angles rounded, tip truncate, longly pilose ; rostrum extending to posterior coxae. Thorax yellowish brown above, pronotum distinctly punctate with golden hair ; metopidium twice as broad as high, vertical at basal one-third, then slightly sloping backwards, pilosity denser near bases of suprahumeral ; suprahumeral horns as viewed from front short, just half as long as space between their bases, directed outwards and slightly upwards, viewed from above, dorso-posterior carina slightly curved forward and outwards ; suprahumeral callosities small, concolorous with metopidium ; humeral angles broad, tips black, subacute ; posterior process strongly tricarinate, distinctly punctate, a weakly developed

gibba behind disc at the level of 1st abdominal segment, apically laterally compressed, rising well above anal angle, ventral keel ampliate, as deep as dorsal keel and weakly serrate, apex acute, extending slightly beyond the tips of tegmina. Tegmina subhyaline, nearly thrice as long as wide, basal sixth greyish, coriaceous, veins reddish brown, 1st apical cell as long as 1st discoidal cell, 1st and 3rd discoidal cells of equal length, apical limbus broad. Legs uniformly light brown. Abdomen yellowish brown.

Measurements : Length from frontal margin to tips of tegmina 7.7 mm. , to tip of posterior process 8.0 mm. ; width across tips of horns 2.7 mm. , at humeral angles 2.8 mm. , at eyes 2.3 mm.

Male : Similar to female ; in some body darker, slightly smaller ; suprahumeral horns shorter ; posterior process extending backwards as far as tegminal tips.

Measurements : Length from frontal margin to tips of tegmina 7.4 mm. , to tip of posterior process 7.4 mm. ; width across tips of suprahumeral horns 2.4 mm. , at humeral angles 2.65 mm., at eyes 2.15 mm.

This species is closely allied to *palus* Buckton in the short suprahumeral horns and apically upturned posterior process, but differs in the distinctly punctate pronotum ; the apices of the horns are not recurved and the tegmina are semihyaline.

Material examined : Female holotype, Z. S. I. Reg. No. 609/H15 male allotype Z. S. I. Reg. No. 610/H15 ; 1 female and 3 male paratypes, 1 male and 2 females, Z. S. I. Reg. No. 611/H15 and 612-613/H15 from Assam, Majhgaoon, 21-1-1966 ; coll. S. K. B. & A. N. T J.

***Oxyrhachis punctatus* n. sp.**

(Pl. VI)

Male : General colour pale reddish brown. Head greyish brown, nearly 1.5 times as wide as long, very finely punctate with short adpressed silvery hairs ; cranial callosities distinct, upper margin of vertex arcuate, lateral margins of foliate lobes rectangularly rounded with inner angles acute, eyes subglobose, pale greyish, ocelli greyish black, conspicuous, nearer to each other than to eyes and situated above the centro-ocular line ; clypeus greyish tinged with red, extending slightly below lower margins of foliate lobes, tip pilose, a little upturned and truncate. Thorax greyish brown, strongly punctate, each puncture with a silvery hair ; metopidium obliquely sloping backwards to disc, 2.3 times as wide as high, supraocular callosities large, black ; suprahumeral horns about as long as space between their bases, viewed from front directed upwards and outwards, tips subacute ; disc between horns convex ; posterior process greyish black, shallowly tectiform at base,

lateral carinae reddish brown, ventral keel finely serrate, apex slightly raised and not reaching the tips of tegmina. Tegmina subhyaline, a little more than 3 times as long as wide, veins yellowish, stout, basal sixth punctate, coriaceous 2nd apical cell a little more than half as long as 1st apical cell, apical limb moderately wide. Abdomen grey brown.

Measurements : Length from frontal margin to tips of tegmina 6.3 mm., to tip of posterior process 6 mm. ; width across tips of suprahumeral horns 3.4 mm. , at humeral angles 2.6 mm. , at eyes 2.1 mm.

Female : unknown.

This species is closely related to *geniculata* n. sp. in the nature of the suprahumeral and the posterior process and in the distinctly punctate pronotum, but differs from it in the colour and position of the ocelli which are nearer to each other than to eyes and situated above the centro-ocular line, and in the nature of the clypeus which extends slightly below the lower margins of foliate lobes.

Material examined : Holotype Z. S. I. Reg. No. 618/H15 male and one male paratype Z. S. I. Reg. No. 619/H15 from Nalgonda Dist. , Daverkonda, Andhra Pradesh, 14-8-1962.

Oxyrhachis grandis n. sp.

(Pl. VII)

Male : General colour black. Head fuscous, two-thirds as long as wide, thickly finely punctate, with adpressed white hairs, upper margin of vertex arcuate, slightly convex in the middle, lateral teeth acute, foliate lobes rectangulate, inner angles broadly acute, eyes subglobose, fuscous, ocelli dull succineous, nearer to eyes than to each other and located on the centro-ocular line ; clypeus almost as wide as long, densely pilose, tip obliquely truncate ; cranial callosities inconspicuous. Pronotum shining black, finely punctate with adpressed white hairs, median carina percurrent, metopidium vertical, twice as wide as high ; supraocular callosities conspicuous, irregular, bare, slightly convex ; humeral angles fuscous ; suprahumeral horns moderately long, much longer than space between their bases, robust, tricarinate, black, viewed from front directed outwards, rising above disc, tips weakly recurved, subacute, viewed from above flattened, directed outwards and backwards. Posterior process tectiform stout, strongly carinate, carinations black, gibba pitch black, apex black, beneath laminately ampliate, strongly keeled, very weakly serrate below, rising moderately upwards and extending as far back as tegminal tips ; propleural process and mesopleural process conspicuous ; tegmina dull hyaline, about 3.5 times as long as wide, base more or less dark ferruginous, veins ferruginous brown, 2nd apical cell about half as long as 1st apical cell, 2nd

discoidal cell only slightly longer than 1st discoidal cell, apical limbus moderately broad ; legs black. Abdominal ferruginous brown.

Measurements : Length from frontal margin to tips of tegmina 6.5 mm. , to tip of posterior process 6.5 mm. ; width across tips of suprahumeral horns 4.4 mm. , at humeral angles 2.7 mm. , at eyes 2.2 mm.

Female : unknown.

This species is closely related to *formidabilis* Dist. in its general colour and in the nature of posterior process, but differs in its smaller body size and in the relative size of the tegminal discoidal cells.

Material examined : Holotype Z. S. I. Reg. No. 616/H15 male in the collections of Zoological Survey of India ; locality and date of collection unknown.

***Oxyrhachis unicolor* n. sp.**

(Pl. VIII)

Male : General colour dark brown. Head fuscous brown, two-thirds as long as wide, finely punctate with short white hairs, upper margin of vertex arcuate, sinuate, lateral teeth inconspicuous, foliate lobes rectangulate, inner margin broadly acute ; eyes subglobose, a little oblique, dark marooned, ocelli distinct, dull succineous, equidistant from each other and from eyes and situated just above centro-ocular line ; cranial callosities indistinct ; clypeus almost as wide as long, sparsely pilose, tip truncate and longly pilose ; pronotum shining dark brown, finely punctate with short silvery pilosity ; metopidium obliquely extending backwards to disc, 3 times as wide as high, median carina percurrent, supraocular callosities very prominent, dark brown, bare, humeral angles broadly obtuse, light brown ; suprahumeral horns stout, short, as long as the space between their bases, viewed from sides directed upwards above the level of disc, tips slightly recurved, subacute, viewed from front directed outwards and upwards, viewed from above directed outwards, flattened ; Posterior process tectiform, punctate, narrow behind disc, strongly carinate with prominent gibba, posterior half only slightly elevated and gently arched near apex which extends as far back as the tegminal tips ; ventral keel serrate ; propleural and mesopleural processes prominent, tegmina dull hyaline, more than three times as long as wide, basal sixth coriaceous, dark brown, veins reddish brown, 2nd apical cell short, about one-third as long as 1st apical cell, apical limbus broad ; legs black ; abdomen dark brown.

Measurements : Length from frontal margin to tips of tegmina 6.6 mm. , to tip of posterior process 6.6 mm. ; width across tips of suprahumeral horns 3.1 mm. , at humeral angles 2.5 mm. , at eyes 2 mm.

Female : unknown.

This species is allied to *gracilis* n. sp. in its general colour and size, but differs in the shorter suprahumeral, narrow posterior process which is less inclined upwards and in the very short 2nd apical cell of tegmina which is just half as long as the 1st apical cell.

Material examined : Holotype male, in the collections of Zoological Survey of India, locality and date of collection not known.

Subfamily *CENTROTINAE*

Tribe LEPTOCENTRINI Distant

Genus *Leptocentrus* Stal

KEY TO THE SPECIES

- | | | | |
|--------|---|--------|---------------------------|
| 1(4) | Posterior process remote from scutellum and tegmina from base to apex. | | |
| 2(3) | Head more than 3 times as wide as long ; frontoclypeus extending to half of its length below lower margins of vertex ; black species... | ... | <i>rubrinigris</i> n. sp. |
| 3(2) | Head nearly 3 times as wide as long ; frontoclypeus extending to three-fourths of its length below lower margins of vertex , greyish black species | ... .. | <i>carinatus</i> n. sp. |
| 4(1) | Posterior process distant from scutellum but with the apex very near to or impinging on inner margins of tegmina. | | |
| 5(8) | Ocelli situated on the centro-ocular line ; frontoclypeus extending to half of its length below lower margins of vertex. | | |
| 6(7) | Head 3 times as wide as long ; suprahumeral shorter than distance between their bases ; posterior process slender and substraight. | ... | <i>rufescens</i> n. sp. |
| 7(6) | Head 2.5 times as wide as long ; suprahumeral slightly longer than distance between their bases ; posterior process stout, strongly arched behind scutellum | ... .. | <i>acuticornis</i> n. sp. |
| 8(5) | Ocelli situated above centro-ocular line. | | |
| 9(12) | Suprahumeral longer than distance between their bases ; apex of posterior process reaching the fourth apical cell of tegmina. | | |
| 10(11) | Head 2.75 times as wide as long ; frontoclypeus extending to half of its length below lower margins of vertex ; tegmina 3 times longer than wide ; posterior process strongly arched behind scutellum | ... .. | <i>splendens</i> n. sp. |
| 11(10) | Head 2.25 times as wide as long ; frontoclypeus extending to three-fourths of its length below lower margins of vertex ; tegmina more than 3 times longer than wide ; posterior process only slightly arched behind scutellus | ... .. | <i>beluri</i> n. sp. |
| 12(9) | Suprahumeral shorter than distance between their bases ; apex of posterior process just passing beyond the inner angles of tegmina and never reaching the fourth apical cell ; large yellowish brown species. | ... .. | <i>luteus</i> n. sp. |

Leptocentrus rubrinigris n. sp.

(Pl. IX)

Male : General coloration black. Head vertical, more than twice as wide as long, thickly pilose with adpressed silvery hairs, upper margin of vertex arcuate, slightly sinuate, lower margins carinate, sloping obliquely to frontoclypeus ; frontoclypeus extending half of its length below lower margins of vertex, tip nearly truncate, basal lobes more or less fused with frontoclypeus, pilosity denser and longer ; eyes subglobose, reddish brown, ocelli succineous, nearer to eyes than to each other and situated above the centro-ocular line. Pronotum black, granulate and punctate with dull white hairs, metopidium convex in front, greyish black with suberect silvery hairs, twice as wide as high, humeral angles dark reddish brown, distinct tips subacute ; suprahumeral horns about 1.3 times longer than distance between bases, broadly based, jet black, viewed in lateral aspects turned obliquely upwards and strongly backwardly recurved, viewed in front narrow and projecting outwards, strongly quadricarinate, anterior carina strong ; posterior process stout, horizontal, arising from posterior half of disc and slightly raised from disc, curved at base and remote from scutellum and tegmina, strongly tricarinate, median carina pitch black and percurrent through metopidium, lateral carinae obscure on disc, apex tapering, tip acute, passing over the posterior angle of inner margin of tegmina and reaching the tip of abdomen. Scutellum jet black, as wide as long, tip slightly rising and emarginate, densely pilose. Tegmina bronzy brown, subopaque, more than three times longer than wide, inner tegminal margin and costal margin marooned with black, apical limbus moderately broad, tip rounded, veins dark brown, 1st apical cell about 7 times longer than maximum width, 1st discoidal cell nearly rectangular, as long as 2nd discoidal cell. Legs uniformly dark brown. Abdomen black.

Measurements : Length from frontal margin to tips of tegmina 7.7 mm. , to tip of posterior process 6.7 mm. ; width across tips of suprahumeral horns 4.9 mm. , at humeral angles 3.0 mm. , at eyes 2.4 mm.

This species is allied to *bajulans* Dist. in the horizontal posterior process which is remote from scutellum and tegmina. It differs from *bajulans* in the nature of the frontoclypeus and basal lobes, as also in the relative size of the discoidal cells of tegmina. In *bajulans* the 1st discoidal cell is much smaller than the 2nd, while in the present species the 1st and 2nd discoidal cells are of nearly equal size.

Material examined : Male holotype from Dhak Khalari Garhwal Dist. , Uttar Pradesh, India, 10,000 ft. , 2-8-1958, coll. B, S. Lamba.

Leptocentrus carinatus n. sp.

(Pl. X)

Female : General colour greyish black with shades of red. Head vertical, nearly twice as wide as long, finely granulate, longly pilose with adpressed silvery hairs, upper margin of vertex nearly planate, lower margins broadly sloping to frontoclypeus, frontoclypeus densely hairy, one and a half time as long as wide and extending three-fourths its length below lower margins of vertex, tip blunt, basal lobes fused and inconspicuous; eyes subglobose, pinkish, ocelli black, nearer to eyes than to each other and situated above the centro-ocular line. Pronotum black, finely granulate, longly pilose with suberect silvery hair, metopidium vertical, granulate and speckled with long suberect white hairs; humeral angles short and blunt; suprahumeral horns stout, 1.5 times longer than distance between their bases, broadly based, strongly tricarinate, carinae jet black, viewed from lateral aspects directed upwards, and outwards and gently curved backwards, tips jet black and acute, bases highly hairy; posterior process horizontal, emerging from posterior half of disc, raised well above and remote from scutellum and tegmina set with long white hairs; median and lateral carinae strong, jet black, tip acute, reaching the middle of 4th apical cell of tegmina; scutellum triangular, nearly as wide as long, greyish black, convex at base, finely punctate with long erect pilosity, tip slightly rising and emarginate; tegmina more than 3 times longer than wide, subhyaline, basal sixth coriaceous, veins greyish, apical limb fairly broad, tip narrowly rounded, 1st apical cell narrow, more than 10 times longer than maximum width, 1st and 2nd discoidal cells of equal length. Legs light brown with a red hue. Abdomen black.

Measurements : Length from frontal margin to tips of tegmina 7.2 mm. , to tips of posterior process 6.2 mm. ; width across tips of suprahumeral horns 5.7 mm. , at humeral angles 2.9 mm. , at eyes 2.6 mm.

Male : Similar to female with the following differences : metopidium convex, projecting forwards, suprahumeral horns stouter and longer, nearly 1.75 times longer than distance between bases, apex strongly recurved backwards.

This species is nearest to *bajulans* Distant and *rubrinigris* n. sp. in the horizontal posterior process remote from scutellum and tegmina, but differs both in the longer suprahumeral horns, subhyaline tegmina which is more than 3.5 times longer than wide, and the uniformly light brown legs.

Material examined : Female holotype, Z. S. I. Reg. No. 617/H15 allotype male, and one paratype male, collected from Barasat, 24 Paraganas, West Bengal, India, 17-12-1965, coll. S. C. Mitra and R. Kulin.

Leptocentrus rufescens n. sp.

(Pl. XI)

Male : General colour greyish black. Head 2.5 times as wide as long, greyish black, upper margin of vertex black, arcuate and sinuate, finely punctate with long adpressed silvery hairs, lower margins weakly sloping to frontoclypeus ; frontoclypeus longer than wide, extending nearly half of its length below lower margins of vertex, tip broadly rounded and with long pilosity, frontoclypeal lobes extending about half the length of frontoclypeus and laterally rounded ; eyes subglobose, greyish black ; ocelli succineous, equidistant from eyes and to each other. Pronotum greyish black, finely punctate, pilosity long and silvery ; metopidium vertical twice as wide as high, supraocular callosities large, rounded, greyish and impunctate ; humeral angles short, dark brown, blunt ; suprahumeral horns dark brown, broadly based, directed outwards rising obliquely well above level of disc, apex weakly backwardly curved, slightly longer than the distance between their bases and extending well beyond humeral angles, tips acute. Posterior process dark brown, emerging horizontally from disc and obliquely from its posterior half, distant from scutellum and impinging on posterior angles of tegmina, tricarinate, with a longitudinal depression between median and lateral carina, apex acuminate and extending as far back as the tip of 5th apical cell of tegmina ; scutellum triangular, as wide as long, basal half white tomentose, distal half black and punctate, apex concavely emarginate, tips acute. Tegmina slightly more than 3 times as long as wide, subhyaline, dark-marooned at tips, basal sixth coriaceous and punctate with short hairs, veins pale brown, apical limb broad, tip subacutely rounded, 1st apical cell 10 times longer than wide, 1st discoidal cell shorter than 2nd. Sides of thorax greyish black, with long white hairs ; legs grey black ; abdomen brown below.

Measurements : Length from frontal margin to tips of tegmina 6.1 mm. , to tip of posterior process 4.9 mm. ; width across tips of suprahumeral horns 4 mm. , at humeral angles 2.3 mm. , at eyes 2.5 mm.

Female : unknown.

This species is nearest to the African species *nubianus* Capener in the nature of the posterior process which emerges horizontally from the disc and in the form of the tegmina, but differs in the general coloration, more obliquely forwardly projecting horns, short humeral angles, and scutellum as long as wide.

Material examined : Male holotype, Z. S. I. Reg. No. 638/H15 from Manoharpur, Behar, India, 29-12-1967, coll. *Raj Tilak*.

Leptocentrus acuticornis n. sp.

(Pl. XII)

Female : General coloration greyish brown. Head yellowish brown, vertical, thrice as wide as long, coarsely punctate with short adpressed silvery pilosity, upper margin of vertex planate, lower margins obliquely sloping to frontoclypeus ; eyes globose, brownish marooned with black, ocelli succineous, nearer to eyes than to each other and situated on the centro-ocular line ; frontoclypeus about as wide as long, extending half of its length below lower margins of vertex, thickly pilose with yellowish brown hairs, tip broadly rounded, basal lobes about one-third the length of frontoclypeus. Pronotum greyish brown, finely punctate, cretaceously sericeous laterally, metopidium convex, obumbrant, set with short sparse hairs, twice as wide as high, supraocular callosities divided and pilose ; humeral angles well developed, light brown, tip subacute ; suprahumeral horns robust, broadly based, about two-thirds as long as distance between bases, directed outwards and then backwards, strongly tricarinate, tips sharply acute and black, rising above disc ; posterior process emerging from posterior half of disc, moderately arched and remote from scutellum and tegmina, dark brown and shortly pilose, apex narrowly acuminate, tip sharply acute, extending over the inner angle of tegmina but not impinging on tegmina and reaching 4th apical cell. Tegmina subhyaline, 3.25 times longer than wide, apical limb broad, tip narrowly rounded, basal sixth coriaceous, piceous brown and punctate, 1st apical cell about 9 times as long as wide, 1st discoidal cell nearly as long as 2nd. Scutellum triangular, as long as wide, white tomentose at basal half, distal half dark brown and slightly upturned, tip emarginate. Legs uniformly greyish brown. Abdomen greyish brown below.

Measurements : Length from frontal margin to tips of tegmina 7.9 mm. , to tip of posterior process 6.4 mm. ; width across tips of suprahumeral horns 4.5 mm. , at humeral angles 3 mm. , at eyes 2.7 mm.

Male : unknown.

Fifth instar nymph : General colour greyish with shades of brown. Head with vertex convex, covered with short sparsely arranged tubercles, tubercular bases black, rostrum reaching second abdominal segment, base of vertex weakly arcuate and sinuate, cranial tubercles inconspicuous ; eyes brown, globose, ocelli closer to eyes than to each other and located on the centro-ocular line ; lower margin of frontoclypeus on a line with lower margins of vertex ; pronotum large, covered with closely arranged tuberculate spines, metopidium vertical, anterior process obliquely raised forwards and then upwards, tip sharply acute ; posterior process about one-third as long as anterior process, extending backwards over mesonotum, tip acuminate, supra-

humeral buds short, black; wing pads greyish, marked with black dots, costal angles distinct, beset with tuberculate spines; metanotum about half as long as mesonotum with three short tuberculate spines above. Abdominal segments slightly telescoped, tip raised upwards, dorsal tubercles of abdomen short, their spines turned backwards and more or less adpressed to body; lateral lamellae with 7 slender tuberculate spines besides short scattered tubercles. Anal tube as long as rest of abdomen. Genital rudiments dark brown.

This species is closely allied to *rhizophagus* Ananthasub. & Ananthak. in the arched nature of the posterior process, in the relative size of the discoidal cells of the tegmina and in the tegminal coloration, but differs in the curvature of the suprahumeral horns, in the planate upper margin of head and in the nature of the frontoclypeus and its lobes.

Material examined: Female holotype, Z. S. I. Reg. No. 639/H15 one fifth instar neponotype, Z. S. I. Reg. Nos. 640/H15 and 641/H15 and one one fourth instar nymph, collected from Rajasthan, Siker Dist., 9-11-1960.

***Leptocentrus splendens* n. sp.**

(Pl. XIII)

Female: General colour black. Head vertical, about two and three-fourths as wide as long, finely punctate with large white pilosity, slightly convex, upper margin of vertex arcuate, lower margins strongly carinate and curved to frontoclypeus; frontoclypeus covered with long pale white hairs, extending half of its length below lower margins of vertex, tip bluntly rounded, and a little upturned, frontoclypeal lobes short and rounded, antennae light brown; eyes subglobose, dark brown, ocelli succineous, very slightly closer to eyes than to each other and situated above the centro-ocular line. Pronotum black, finely punctate, with long suberect silvery hairs, median carina percurrent, metopidium convex, vertical, 1.5 times wider than high, with long erect pale white hairs, humeral angles prominent and blunt with an anterior carina, posterior angles rounded; suprahumeral horns robust, broadly based, directed upwards, then outwards and backwards, about 1.5 times longer than distance between their bases, strongly tricarinate, tips sharply acute, jet black; posterior process black, pilose, emerging from the posterior one-third of disc, and vertically from posterior margin, rising slightly above the level of disc, remote from scutellum and gently arched, tip acuminate, extending as far caudad as the 4th apical cell of tegmina, strongly tricarinate; scutellum triangular, about as wide as long, a little convex at base, finely punctate with long silvery hairs, tip slightly rising and concavely emarginate. Tegmina about 3 times longer than wide, dark brown, subopaque, basal sixth coriaceous and punctate, apical limbus moderately broad, tip rounded, 1st

apical cell about 6 times longer than wide, 1st discoidal cell nearly rectangular, smaller than 2nd discoidal cell. Sides of thorax black ; legs entirely dark brown. Abdomen dark brown with silvery hairs below.

Measurements : Length from frontal margin to tips of tegmina 8 mm., to tip of posterior process 6.4 mm.; width across tips of suprahumeral horns 6.1 mm., at humeral angles 3.0 mm., at eyes 2.6 mm.

Male : unknown.

This species is related to *bauhiniae* Ananthasub. & Ananthak. in the coloration of the body and in the disposition of the posterior process, but differs in the dark, subopaque nature of tegmina and the relatively less recurved suprahumeral horns.

Material examined : Female holotype, Z. S. I. Reg. No. 642/H15, from Murdhari, Poona, India, 4-9-1962. Coll. P. J. K.

Leptocentrus beluri n. sp.

(Pl. XIV)

Female : General coloration piceous brown. Head vertical, almost planate, 2.5 times as wide as long, light brown with long sparse adpressed silvery hairs ; upper margin of vertex arcuate, lower margins weakly sloping to frontoclypeus, frontoclypeus longer than wide, extending to three-fourths its length below lower margins of vertex, densely longly pilose, tip nearly blunt, lobes semicircular and small ; eyes subglobose, pale red ; ocelli succineous, closer to eyes than to each other and situated well above the centro-ocular line ; antennae pale brown, genae with long silvery pilosity. Pronotum piceous brown, finely punctate with long pilosity ; metopidium vertical, broader than high, supraocular callosities broken and subprominent ; humeral angles prominent, blunt with an anterior carina ; suprahumeral horns robust, longer than distance between bases, moderately broad at base, directed upwards well above disc and outwards and very weakly backwardly curved, tapering to acute tips, strongly tricarinate with an additional postero-dorsal carina. Posterior process piceous brown, originating from the posterior half of disc, raised above scutellum and tegmina, tricarinate, longly pilose, almost horizontal upto half of its length, slightly ampliate near apex, tip sharply acute, never impinging on inner angles of tegmina, reaching upto the 4th apical cell, median carina strongly percurrent. Tegmina about 3.25 times longer than wide, semihyaline, apical limbus broad, tip narrowly rounded, veins light brown, basal sixth reddish brown, 1st apical cell about 8 times longer than maximum width with a dark patch about the middle ; 1st discoidal cell shorter than 2nd. Scutellum white tomentose at basal lateral third, rest rusty brown, tip emarginate. Legs and abdomen uniformly rusty brown.

Measurements : Length from frontal margin to tips of tegmina 7.4 mm., to tip of posterior process 6.2 mm. ; width across tips of horns 5.1 mm. , at humeral angles 2.8 mm. , at eyes 2.6 mm.

Male : Similar to female in general coloration but smaller ; supra-humeral horns shorter ; posterior process slightly arched behind scutellum ; abdomen dark brown ventrally.

Measurements : Length from frontal margin to tips of tegmina 6.8 mm. , to tip of posterior process 5.6 mm. ; width across tips of horns 4.9 mm. , at humeral angles 2.6 mm. , at eyes 2.4 mm.

This species is allied to *mangiferae* Ananthasub. & Ananthak. in the general disposition of the suprahumeral horns and posterior process but differs in the presence of distinct frontoclypeal lobes, in the longer frontoclypeus and in the relative sizes of the discoidal cells of tegmina.

Material examined : Female holotype, Z. S. I. Reg. No. 643/H15, male allotype Z. S. I. Reg. No. 644/H15 and one paratype male Z. S. I. Reg. No. 645/H15, from Belur, Howrah Dist. West Bengal, India, 14-1-1966, coll. T. R. Mitra & Party.

Leptocentrus luteus n. sp.

(Pl. XV)

Female : General coloration yellowish brown. Head vertical, two and three-fourths as wide as long, granulate and punctate with long sparse silvery hairs, upper margin of vertex arcuate, lower margins obliquely sloping to frontoclypeus ; frontoclypeus greyish yellow, extending three-fourths of its length below lower margins of vertex, sparsely pilose with long adpressed white hairs, lateral margins parallel and carinate, tip nearly truncate, antennae straw coloured ; eyes subglobose, reddish brown, ocelli succineous, equidistant from eyes and to each other and located above the centro-ocular line. Pronotum yellowish brown, darkly granulate with sparsely arranged silvery hairs ; metopidium slightly slanting backwards, coarsely punctate, twice as wide as high, supraocular callosities prominent, disc somewhat convex, humeral angles concolorous with metopidium, short, tips subacute ; supra ocular callosities broken, greyish black ; suprahumeral horns dark brown, shorter than distance between their bases, tricarinate, from lateral aspects raised upwards and strongly backwardly recurved, viewed from above turned outwards and backwards, tips acute, seen in front narrow, directed outwards ; posterior process slender, slightly sinuate, arising from the posterior end of disc, recurved from base, well raised from disc and widely separated from scutellum, extending as far back as the posterior angles of the inner margin of tegmina, apex gradually acuminate, tip impinging on tegmina, dorsal carina finely percurrent through metopidium. Tegmina straw yellow,

three times as long as wide, basal sixth dark brown, coriaceous, veins yellowish brown and stout, 1st apical cell 5 time as long as maximum width ; in the type the 1st discoidal cell absent on right tegmen, hind wings with 4 apical cells. Legs light brown except tarsi which are shaded with black. Abdomen yellowish brown below ; ovipositor dark reddish brown.

Measurements : Length from frontal margin to tips of tegmina 9.3 mm. , to tip of posterior process 7.5 mm. ; width across tips of suprahumeral horns 4.8 mm. , at humeral angles 3.4 mm. , at eyes 3.2 mm.

Male : unknown.

This species is related to *scutellatus* Dist. in the moderately long suprahumeral and the slender sinuate posterior process the apex of which slightly passes the posterior angle of the inner tegminal margin, but differs from it in the shorter frontoclypeus, the strongly recurved suprahumeral and in the general coloration of the body.

Material examined : Female holotype Z. S. I. Reg. No. 646/H15 from Harjeana forest, Jaigon F. Block, Oarchshankar F. Range, Hoshvarpur Dist. , 24-12-1962 ; coll. R. K. B. (Z. S. I. Northern Regional Station, Dehra Dun).

Tribe TRICENTRINI Ahmad & Yasmeen

Genus *Tricentrus* Stal

KEY TO THE SPECIES

- | | | | |
|--------|--|-----|---------------------------|
| 1(26) | Posterior process just reaching or just passing beyond the posterior angle of tegmina. | | |
| 2(7) | Tip of posterior process slightly inclined upwards. | | |
| 3(6) | Frontoclypeus extending to one half of its length below lower margins of vertex ; 1st and 2nd discoidal cells of tegmina of equal length. | | |
| 4(5) | Metopidium 1.5 times as wide as high ; tegmina 3 times longer than wide. ... | ... | <i>minomorii</i> n. sp. |
| 5(4) | Metopidium twice as wide as high ; tegmina 2.5 times longer than wide. ... | ... | <i>longicornis</i> n. sp. |
| 6(3) | Frontoclypeus extending to three-fourths of its length below lower margins of vertex ; 1st discoidal cell smaller than 2nd ; tegmina 3 times longer than wide. ... | ... | <i>cinereus</i> n. sp. |
| 7(2) | Tip of posterior process impinging on tegmina. | | |
| 8(19) | Frontoclypeus extending to one half of its length below lower margins of vertex. | | |
| 9(16) | 1st discoidal cell of tegmina petiolate | | |
| 10(15) | 1st discoidal cell of tegmina shorter than 2nd. | | |

11 14)	Tegmina 3 times longer than wide ; 1st apical cell 6 times longer than its maximum width.			
12(13)	Large black species	...	...	<i>compressus</i> n. sp.
13(12)	Small greyish yellow species.	...	...	<i>unicolor</i> n. sp.
14(11)	Tegmina 2.75 times longer than wide ; 1st apical cell about 5 times longer than its maximum width ; black species	...	...	<i>atrus</i> n. sp.
15(10)	1st discoidal cell of tegmina of same length as 2nd ; suprahumeral horns half as long as distance between their bases.	...	...	<i>miuusculus</i> n. sp.
16(9)	1st discoidal cell of tegmina not petiolate.			
17(18)	1st discoidal cell much narrower than 2nd ; suprahumeral horns shorter than distance between their bases	...	...	<i>elegans</i> n. sp.
18(17)	1st discoidal cell nearly as wide as 2nd ; suprahumeral horns as long as distance between their bases	...	...	<i>dubius</i> n. sp.
19(8)	Frontoclypeus extending to three-fourths or more of its length below lower margins of vertex.			
20(23)	1st discoidal cell of tegmina petiolate and smaller than the 2nd.			
21(22)	1st apical cell of tegmina about 3.5 times longer than its maximum width.	...	...	<i>recurvicornis</i> n. sp.
22(21)	1st apical cell of tegmina about 9 times longer than its maximum width,	...	...	<i>cornutus</i> n. sp.
23(20)	1st discoidal cell of tegmina not petiolate.			
24(25)	Posterior process robust and flat ; 1st discoidal cell of tegmina as long as 2nd	...	...	<i>platycornis</i> n. sp.
25(24)	Posterior process normal and not flattened ; 1st discoidal cell of tegmina longer than 2nd.		...	<i>longiceps</i> n. sp.
26(1)	Posterior process not reaching posterior angle of inner margin of tegmina ; suprahumeral horns variable in length ; purplish brown species.	...	...	<i>varicornis</i> n. sp.

Tricentrus minomorii n. sp.

(Pl. XVI)

Female : General coloration greyish brown. Head greyish black, speckled with dark spots, about two and three-fourths as wide as long, sparsely pilose with long silvery hairs, base slightly convex at junction with metopidium ; frontoclypeus extending half of its length below lower margins of vertex, tip broadly rounded, thickly pilose with long silvery hairs ; eyes yellowish brown ; ocelli black, located slightly above centro-ocular line, closer to eyes than to each other ; pronotum greyish brown dorsally, black laterally ; metopidium slightly convex, nearly vertical, greyish brown, densely pubescent, one and a half time as wide as high, supraocular callosities conspicuous with

black margins ; tips of humeral angles blunt ; suprahumeral horns moderately stout, about half as long as distance between bases, longly pilose, pilosity denser at basal half, projecting slightly forwards, then outwards and recurved backwards, tips subacute, tricarinate, dorsal carina strong ; posterior process greyish black, slender, tricarinate, apical half distinctly inclined upwards, tip acute, dark brown, passing beyond the inner margin of tegmina and reaching the middle of the 5th apical cell, dorsal carina very strong, bronzy brown, percurrent through metopidium ; tegmina hyaline, thrice as long as wide, veins yellowish, costal margin adjacent to 2nd apical cell and apical limb smoky brown, basal sixth black, punctate, first apical cell nearly 4 times as long as wide, 1st discoidal cell non-petiolate, 2nd discoidal cell nearly as long as first. Abdomen black ; legs black upto femur, tibiae and tarsi grey.

Measurements : Length from frontal margin to tips of tegmina 5.5 mm. , to tip of posterior process 4.25 mm. ; width across tips of horns 3.8 mm. , at humeral angles 2.8 mm. , at eyes 2.5 mm.

Male : unknown.

This species is allied to *longicornis* n. sp. in the general coloration and the upturned tip of posterior process which passes beyond the inner angle of tegmina, but differs from it in the longer suprahumeral and in the non-petiolate first discoidal cell of tegmina.

Material examined : Holotype female Z. S. I. Reg. No. 659/H15 from Sonai Rupai Forest, Minomori, NEFA, India, 30-11-1965 ; coll. S. K. B.

Tricentrus longicornis n. sp.

(Pl. XVII)

Female : General coloration greyish brown. Head twice as wide as long, vertex slightly arcuate, slightly punctate, with more or less closely arranged golden hairs ; eyes golden yellow, ocelli white, located well above the centro-ocular line, closer to eyes than to each other ; frontoclypeus extending nearly half of its length below lower margins of vertex, thickly pilose, tip more or less truncate, basal lobes distinct. Pronotum greyish brown, finely punctate, with golden pilosity, metopidium almost vertical, twice as wide as high, supra-ocular callosities small but distinct, bare ; humeral angles prominent ; tips blunt ; suprahumeral horns greyish marooned with black patches, densely pilose, strongly tricarinate, carinae black, as viewed from lateral aspect slightly projecting forwards, then upwards, tips strongly recurved, as viewed from above much broader with recurved acute tips ; posterior process greyish brown at basal fourth, golden yellowish in the middle, tip shaded with black, somewhat straight, contiguous with scutellum, tip acute, raised above tegminal margin and extending well beyond the posterior angles

of the inner margins of tegmina. Tegmina 2.5 times longer than wide, costal margin much thickened, 1st apical cell 7 times longer than its maximum width, which equals the thickness of the costal margin opposite to it, 1st discoidal cell petiolate, 2nd discoidal cell as long as the 1st. Abdomen brownish. Legs black upto femur, tibiae greyish brown, tarsi pale brown.

Measurements : Length from frontal margin to tips of tegmina 4.1 mm. , to tip of posterior process 3.2 mm. ; width across tips of suprahumeral horns 2.65 mm. , at humeral angles 2.4 mm. , at eyes 2.3 mm.

Male similar to female.

This species is closely related to *allabens* Dist. and *minomorii* n. sp. in the elevated terminal part of posterior process which extends beyond the posterior angles of inner margins of tegmina, but differing from both in the shorter suprahumeral and blunt tips of humeral angles.

Material examined : Female holotype Z. S. I. Reg. No. 660/H15, male allotype Z. S. I. Reg. No. 661/H15 and one female paratype Z. S. I. Reg. No. 662/H15 from Manoharpur, Bihar, India, 30-12-1967 ; coll. *Raj Tilak*.

***Tricentrus cinereus* n. sp.**

(Pl. XVIII)

Female : General coloration fuscous brown ; head nearly 2.3 times as wide as long, dark brown thickly pilose with silvery hairs, base of vertex planate, eyes fuscous brown, subglobose, ocelli succineous, closer to eyes than to each other and located just above the centro-ocular line ; frontoclypeus light brown, thickly longly pilose, extending about three-fourths of its length below lower margins of vertex, tip nearly truncate, basal lobes small ; lateral and ventral surfaces of thorax white tomentose ; pronotum fuscous brown, very broad, thickly pilose, metopidium gently sloping, convex in front, twice as wide as high ; supraocular callosities prominent, black and punctate ; humeral angles large, sparsely pilose, tips obtuse ; suprahumeral horns robust, more than three-fourths as long as width between bases, viewed from lateral and dorsal aspects projecting upwards with tips sharply recurved, lateral carinae prominent, black, viewed from the front much narrower, apices subacute ; posterior process tricarinate, median carine strong, lateral carinae weak, basal half heavy, contiguous with scutellum, apical half attenuate, weakly arched, pale reddish brown, slightly raised above tegmina, apex black, passing beyond apex of clavus. Tegmina semihyaline, 3 times longer than wide, basal sixth fuscous, coriaceous, punctate, enclosing a rounded pale white fascia, veins light yellowish, apical limb fairly broad, tip broadly rounded with a dark patch opposite to 1st apical cell ; 1st apical cell nearly 8 times longer than wide, 1st

discoidal cell not petiolate, slightly longer than 2nd discoidal cell ; legs dark brown ; abdomen black ventrally.

Measurements : Length from frontal margin to tips of tegmina 5.4 mm. to tip of posterior process 3.8 mm. ; width across tips of suprahumeral horns 3.6 mm., at humeral angles 2.7 mm., at eyes 2.4 mm.

Male : unknown.

This species is allied to *subangulatus* Dist. and *dubius* n. sp. in the stout suprahumeral and their disposition and in the presence of a rounded fascia near the basal part of tegmina, but differs in the coloration of tegmina, very broad pronotum and rather attenuated posterior process which is not contiguous with tegmina.

Material examined : Female holotype Z. S. I. Reg. No. 663/H15 and one paratype female Z. S. I. Reg. No. 664/H15 from Lakshmikantapur, Calcutta, West Bengal, India, 15-10-1965.

Tricentrus compressus n. sp.

(Pl. XIX)

Female : General coloration black. Head nearly two and three-fourths as wide as long, obliquely directed backbeards, sprinkled with long silvery hairs ; upper margin of vertex slightly arcuate ; eyes yellowish brown, subglobose, moderately projecting outwards ; ocelli pale white, closer to eyes than to each other and situated on the centro-ocular line ; frontoclypeus densely pilose, subovate, extending about a half of its length below lower margins of vertex, tip broadly rounded and slightly convex. Pronotum black, laterally compressed, sprinkled with silvery pilosity ; metopidium convex and almost vertical, nearly two and a half times wider than high, supraocular callosities distinct and punctate ; humeral angles black, subacute with posterior margins rounded at lateral angles ; suprahumeral horns about two thirds as long as width between bases, obliquely directed upwards and outwards, tips subacute and slightly inclined backwards, carinae weakly developed ; posterior process stout at base, slender beyond middle to the apex, central and lateral carinations weak, central carination extending through metopidium, tip black, reaching the anal angle of and impinging on tegmina ; tegmina three times as long as wide, apical cells bounded by dark brown veins ; 1st apical cell 6 times longer than its maximum width, 1st discoidal cell petiolate. Legs light brown except trochanters and femora which are black ; hind trochanters toothed on the dilated internal surface. Abdomen dark brown. Ovipositor black.

Measurements : Length from frontal margin to tips of tegmina 6.4 mm. , to tip of posterior process 4.4 mm. ; width across tips of suprahumeral horns 3.0 mm. , at humeral angles 2.5 mm. , at eyes 2.2 mm.

This species is related to *kamaonensis* Dist. in the general shape of the body, and in the somewhat slender apical region of the posterior process, but differs in the absence of tomentosity of the lateral area of the sternum and in the absence of a white transverse fascia near the basal area of the tegmina.

Material examined : Holotype female Z. S. I. Reg. No. 665/H15 collected from Pander Keshwar, Garhwal Dist. , U. P. , India, 9000 ft. , 1-7-1958 ; coll. B S. Lamba.

***Tricentrus unicolor* n. sp.**

(Pl. XX)

Male : General coloration greyish yellow. Head vertical, greyish yellow sprinkled with adpressed silvery hairs, nearly twice as wide as long, upper margin slightly arcuate, lower margins convexly sloping to frontoclypeus ; eyes hemispherical, yellowish brown, ocelli succineous, equidistant to each other and from eyes and located distinctly above the centro-ocular line ; frontoclypeus covered with pale white hairs, extending to half of its length below lower margins of vertex, tip truncate, basal lobes inconspicuous ; pronotum greyish yellow, finely punctate with sparse silvery pilosity, median carina percurrent, metopidium obliquely turned to dorsum about twice as wide as high, humeral angles subprominent, posterior angles rounded and slightly arched over base of scutellum ; suprahumeral horns short, half as long as distance between their bases, tricarinate, directed outwards and backwards, tips black, subacute ; posterior process greyish, emerging behind disc, moderately stout, dorsal carina strong, black, lateral carinae weak, tip acute, reaching the posterior angle of the inner margin of tegmina ; tegmina light reddish brown, nearly thrice as long as wide, apical limbus moderately broad, tip rounded, first apical cell about 6 times longer than its maximum width, 1st discoidal cell petiolate, about one-third as large as 2nd discoidal cell, costal margin opposite to 1st apical cell narrow ; sides of thorax greyish yellow with white tomentosity ; legs entirely greyish yellow ; genitallic sternal plate black.

Measurements : Length from frontal margin to tips of tegmina 4.4 mm., to tip of posterior process 3.1 mm. ; width across tips of suprahumeral 2.7 mm.; at humeral angles 2.2 mm., at eyes 2 mm.

Female : unknown.

This species is closely allied to *gibbosulus* walker and *dubius* n. sp. in the short robust suprahumeral horns and in the posterior process ; it differs from both in the very small first discoidal cell of tegmina which is only one-third as large as the 2nd discoidal cell.

Material examined : Male holotype Z. S. I. Reg. No. 617/H15 and one paratype male from Kunihar, Solan (H. P.); 19-4-1970 ; coll. M. C.

Tricentrus atrus n. sp.

(Pl. XXI)

Male : General colour dull black. Head black, two and a half times as wide as long, finely punctate with golden pilosity, upper margin arcuate, lower margins obliquely extending to frontoclypeus with longer pilosity ; frontoclypeus densely hairy, extending to half of its length below lower margins of vertex, sides parallel, tip nearly truncate, basal lobes inconspicuous ; eyes hemispherical, pale yellowish white, ocelli succineous, closer to eyes than to each other and situated above the centro-ocular line ; pronotum black above and at sides, metopidium 4 times as wide as high, slightly oblique as it passes to disc and with thickly arranged adpressed hairs ; humeral angles prominent, black, tips subacute ; suprahumeral horns short, rather slender, broadly based, tricarinate, carinae prominent, viewed from the lateral aspects apices black, not projecting beyond the level of disc, tips recurved, viewed from front thinner, directed outwards ; posterior process with a strong black slightly arched dorsal carina percurrent through metopidium, lateral carinae weak, tip acute, reaching the posterior angle of inner margin of tegmina. Tegmina semihyaline, about 2.75 times longer than wide, apical limb moderately broad with a black patch opposite to 2nd apical cell, veins dark brown, 1st apical cell about 5 times as long as its maximum width, 1st discoidal cell petiolate, shorter than 2nd discoidal cell ; legs black upto femora, rest light brown ; abdomen black ventrally.

Measurements : Length from frontal margin to tips of tegmina 6 mm. , to tip of posterior process 4.3 mm. ; width across tips of suprahumeral 4 mm. , at humeral angles 3.4 mm. , at eyes 2.9 mm.

Female : unknown.

This species allied to *gibbosulus* Walker in the short stout suprahumeral and in the nature of the posterior process, but differs from it in having a low metopidium and also in the nature of the 1st apical cell of tegmina.

Material examined : Holotype male Z. S. I. Reg. No. 668/H15 from Bichalim uphill, Goa, on the host plant, *Anacardium occidentale* ; 10-4-1966 ; coll. Pradhan & party.

Tricentrus minusculus n. sp.

(Pl. XXII)

Male : General coloration black. Head twice as wide as long, directed downwards and then backwards, sprinkled with short hairs ; upper margin of vertex arcuate ; eyes reddish brown, subglobose ; ocelli black, distinctly closer to eyes than to each other and located slightly above the centro-ocular line ;

frontoclypeus with short silvery hairs, extending to about one-half its length below the lower margins of vertex, tip nearly truncate; frontoclypeal lobes inconspicuous. Pronotum dark reddishbrown dorsally and laterally, finely punctate near bases of horns, with short white hairs; metopidium sloping backwards, twice as wide as high, supraocular callosities black, punctate, conspicuous; humeral angles light brown, tips nearly acute; suprahumeral horns about one-third as long as width between bases, directed upwards, and then turned obliquely backwards, tips acute, carinae well developed; posterior process reddish brown at basal half, black at terminal one-fifth, lateral carination weak, central carina extending through metopidium, tip acute, very slightly upturned, just reaching the apex of clavus; tegmina smoky brown, two and three-fourths as long as wide, basal sixth darkbrown and punctate, veins reddish brown, apical limb wide, smoky hyaline, 1st discoidal cell petiolate, same length as 2nd discoidal cell; 1st apical cell about 7 times longer than its maximum width. Legs with trochanters and femora dark brown, tibiae pale white, tarsi reddish brown. Abdomen black.

Measurements : Length from frontal margin to tips of tegmina 4.6 mm., to tip of posterior process 3.1 mm.; width across tips of suprahumeral 2.8 mm., at humeral angles 2.3 mm., at eyes 2.2 mm.

Female : unknown.

This species is nearest to *recurvicornis* n. sp. in the short recurved horns and petiolate 1st discoidal cell and in the nature of the 1st apical cell, but differs in the shape of the frontoclypeus and in the relative size of discoidal cells.

Material examined : Holotype male Z. S. I. Reg. No. 669/H15 from Maharashtra, Poona, Gundgardrum, 8-2-1972, coll. K. V L. Narayana.

Tricentrus elegans n. sp.

(Pl. XXIII)

Male : General coloration black. Head black, sprinkled with dark spots, arcuate, about 3 times as wide as long, sparsely hairy, frontoclypeus extending about half of its length below lower margins of vertex, tip broadly rounded, densely pilose with golden hairs, frontoclypeal lobes inconspicuous; eyes cream-coloured with a black dot at centre, subglobose, ocelli translucent, located slightly above centro-ocular line, closer to eyes than to each other. Pronotum black dorsally and laterally, metopidium convex and obliquely directed backwards, nearly two and a half times as wide as high, supraocular callosities not very conspicuous, tips of humeral angles subacute, suprahumeral horns short, about half as long as distance between bases, viewed from sides turned upwards, viewed from front directed outwards and upwards, tips

slightly recurved, dorsal carina weak, lateral carina strong ; posterior process stout, black, depressed at base just behind metopidium and then slightly arched at middle, dorsal carina percurrent through metopidium, lateral carinae weak, tip subacute, just reaching the posterior angle of the inner margin of tegmina ; tegmina thrice as long as wide, hyaline, costal margin not thickened, first apical cell more than 6 times longer than wide, 1st discoidal cell not petiolate, 2nd discoidal cell about one and a half times as wide as 1st and of equal length ; legs black upto femora, tibiae and tarsi greyish. Abdomen pitch black.

Measurements : Length from frontal margin to tips of tegmina 4.9 mm. , to tip of posterior process 3 mm. ; width across tips of horns 2.1 mm. , at humeral angles 2 mm. , at eyes 1.8 mm.

Female : unknown.

This species is allied to *congestus* Walker in the black colour of head and pronotum, in the obliquely ascendant stout suprahumeral horns and in the short centrally posterior process, but differs in the short suprahumeral, which are only moderately curved.

Material examined : Holotype male Reg. No. Z. S. I. 670/H15 from Tawang camp, Kameng division, NEFA, India, 12-12-1965 ; coll. S. K. B. & A. N. T. J.

***Tricentrus dubius* n. sp.**

(Pl. XXIV)

Female : General coloration black. Head vertical, vertex black, slightly more than twice as wide as long, weakly convex, finely punctate with adpressed golden pilosity ; upper margin strongly arcuate, lower margins carinate, sloping to frontoclypeus ; eyes dark brown, subglobose ; ocelli succineous, nearer to eyes than to each other and situated above the centro-ocular line ; frontoclypeus about 1, 5 times longer than wide, extending nearly half of its length below lower margins of vertex, tip blunt, basal lobes conspicuous, pilosity below lobes rather long. Pronotum black, punctate with short golden hairs, lateral and ventral areas of thorax cretaceously sericeous ; metopidium convex, nearly vertical, about twice as wide as high, supraocular callosities somewhat obscure ; humeral angles more or less prominent, tips blunt, posterior angles rounded into transverse posterior margin. Suprahumeral horns viewed from side stout, directed upwards and then backwards, as seen from above rather short, broad, gently recurved, apex subacute, posterior process robust, slightly raised behind the level of metathorax, gradually narrowing to apex, which reaches the posterior angle of inner margin of and impinges on tegmina, tip acute and pitch black, dorsal and lateral carinae fine, the dorsal carina continued through metopidium. Tegmina pale brown, nearly 3 times as long as wide, basal sixth coriaceous, black, punctate with a distinct rounded paler fascia on outer margin, apical limb broad with

a distinct black patch opposite to 2nd apical cell ; veins reddish brown ; costal margin thickened above 1st apical cell, 1st discoidal cell not petiolate. Legs black. Abdomen black ventrally.

Measurements : Length from frontal margin to tips of tegmina 5.0 mm., to tip of posterior process 3.4 mm. ; width across suprahumeral horns 3.5 mm., at humeral angles 2.4 mm., at eyes 2.0 mm.

Male : General coloration similar to female ; frontoclypeus extending nearly two-thirds of its length below lower margins of vertex ; metopidium slightly obliquely directed ; suprahumeral horns more prominently recurved.

Measurements : Length from frontal margin to tips of tegmina 4.6 mm., to tip of posterior process 3.1 mm. ; width across suprahumeral horns 2.7 mm., at humeral angles 2.15 mm., at eyes 2 mm.

This species is near to *subangulatus* Dist. and *pilosus* Ananthasub. & Ananthak. in the general coloration, in the disposition of horns and posterior process and in having a rounded paler fascia on the basal part of tegmina but differs in having a black patch on tegmina opposite to the 2nd apical cell and in the lesser pilosity.

Material examined : Female holotype, Reg. No. Z. S. I. 671/H15, male allotype, one paratype female and one paratype male from 24-parganas, West Bengal, Calcutta, 17-12-1965, coll. S. C. Mitra and R. Kulin ; one female paratype from Tarakeswar, West Bengal, India, 15-10-1965, coll. Kuldip Rai.

Tricentrus recurvicornis n. sp.

(Pl. XXV)

Male : General coloration reddish brown ; head thickly pilose, three and a half times as wide as long ; upper margin of vertex slightly arcuate, lower margins obliquely sloping to frontoclypeus, eyes subglobose, pale white ; ocelli translucent, closer to eyes than to each other and located on the centro-ocular line ; cranial callosities inconspicuous ; frontoclypeus ochraceous, densely pilose, as long as wide, extending more than three-fourths its length below lower margins of vertex, tip broadly rounded, frontoclypeal lobes prominent ; pronotum dark brown, coarsely punctate, longly pilose ; metopidium vertical with subacute tips ; suprahumeral horns short, black, about one-sixth as long as space between their bases ; as viewed from lateral aspect, obliquely raised and then curved backwards, viewed from the front somewhat narrow and turned outwards with their apices acute ; posterior process black tricarinate, contiguous with tegmina, apex acuminate, reaching the inner angle of clavus, dorsal carina percurrent through metopidium, lateral carinae prominent, black ; tegmina semihyaline, nearly 2.5 times longer than broad, 1st discoidal cell petiolate, much smaller than 2nd discoidal cell. Abdomen and terminalia black ; legs black as far as trochanter, the rest light black.

Measurements : Length from frontal margin to tips of tegmina 4.6 mm. , to tip of posterior process 3.5 mm. , width at tips of suprahumeral 3.15 mm. , at humeral angles 3 mm. , at eyes 2.4 mm.

Female : unknown,

This species is related to *minusculus* n. sp. in the short recurved suprahumeral, petiolate 1st discoidal cell of tegmina, etc. , but differs in the shape of the frontoclypeus which extends to three-fourths of its length below lower margins of vertex, in the distinct frontoclypeal lobes and in the relative length and width of tegmina.

Material examined : Holotype male, Reg. No. Z. S. I. 675/H15 Solan (H. P.), Kunihar, 19-4-1970 ; in Z. S. I. , H. A. R. S. collections.

***Tricentrus cornutus* n. sp.**

(Pl. XXVI)

Female : General coloration rusty brown. Head vertical, thrice as wide as long, thickly pilose with adpressed golden hairs, upper margin of vertex strongly arcuate, lower margins carinate, gradually sloping to frontoclypeus ; frontoclypeus thickly pilose, extending more than 4 times its length below lower margins of vertex, frontoclypeus lobes small but distinct ; eyes subglobose, light reddish yellow, ocelli succineous, closer to eyes than to each other and located above centro-ocular line. Pronotum tawny brown, lateral aspects of thorax and scutellum white tomentose, metopidium convex, vertical nearly 4 times as wide as high, finely punctate with golden hairs, supraocular callosities rather obscured by pilosity ; humeral angles black, short, tips acute rounded ; suprahumeral horns as long as distance between bases, tricarinate, carinae and apical half black, broadly based, projecting upwards and outwards, tips gently recurved ; posterior process tawny brown, slightly arched in middle, dorsal carina finely percurrent through metopidium, lateral carinae weak, apical half attenuate, apex passing a little beyond the cavus and reaching the posterior angle of the inner margin of tegmina. Tegmina 3.5 times as long as wide, semihyaline, with a large rounded pale white fascia on the basal sixth, apical limbus broad, apex narrowly rounded, costal margin opposite to 1st apical cell not thickened, apical cell about 9 times as long as maximum width, 1st discoidal cell petiolate, half as long as 2nd discoidal cell ; legs rusty brown throughout. Abdomen rusty brown ; ovipositor black.

Measurements : Length from frontal margin to tips of tegmina 5.8 mm., to tip of posterior process 4.2 mm. ; width across tips of horns 3.9 mm., at humeral angles 3 mm., at eyes 2.1 mm.

Male : unknown.

This species is very closely allied to *recurvicornis* n. sp. in the frontoclypeus extending to three-fourths of its length below lower margins of vertex

and the petiolate nature of the 1st discoidal cell which is smaller than the 2nd ; but differs in the very long narrow 1st apical cell of the tegmina which is about 9 times longer than its maximum width.

Material examined : Holotype female Reg. No. Z. S. I. 676/H15 from Canning Garosthan Ghari, Calcutta, India, 18-10-1915 ; coll. *A. N. T Joseph*.

***Tricentrus platycornis* n. sp.**

(Pl. XXVII)

Female : General coloration pale reddish brown ; head vertical, nearly thrice as wide as long, vertex dark ochraceous, finely punctate, with adpressed hairs, weakly convex, upper margin shallowly arcuate, lower margins sloping and curved to frontoclypeus, twice as long as wide, extending to three-fourths of its length below lower margins of vertex, a little laterally expanded at tip which is truncate and carinate with long pilosity, basal lobes short but conspicuous ; eyes subglobose, pale reddish brown, ocelli pale succineous, closer to eyes than to each other and situated on the centro-ocular line. Pronotum greyish brown, finely punctate with recumbent hairs, lateral areas of sternum cretaceously sericeous ; metopidium vertical, nearly thrice as wide as high, supraocular callosities small and broken, black, humeral angles prominent and rectangular from frontal aspect, posterior angles broadly curved, tips blunt ; suprahumeral horns robust, a little shorter than width between bases, as seen from lateral aspects projecting forwards and upwards, as viewed from above broad and projecting outwards, as viewed in front narrower and directed obliquely outwards and forwards ; posterior process somewhat short, robust, centrally not raised, lateral carinae weak, central carination finely continued through pronotum, apex just reaching the posterior angle of the inner margin of tegmina, tip acute and black ; tegmina amber-coloured, 3 times longer than side, apical limb not broad, tip acutely rounded, basal sixth coriaceous and punctate, veins yellow, costal margin opposite to 1st apical cell moderately thickened, 1st apical cell long, narrow, more than 10 times longer than wide, 1st discoidal cell with a very short petiole, equal in length to 2nd discoidal cell ; legs dark brown.

Measurements : Length from frontal margin to tips of tegmina 5.5 mm., to tip of posterior process 4 mm. ; width across tips of horns 4.4 mm. ; at humeral angles 3.4 mm. ; at eyes 2.5 mm.

Male : unknown.

This species is nearer to *cinereus* n. sp. in the robust upturned suprahumeral horns and the nature of tegmina, but differs from it in the stout broader posterior process which is not strongly carinate.

Material examined : Female holotype Reg. No. Z. S. I. 677/H15 and three paratype females Reg. No. Z. S. I. 678-680/H15 from Kunihar, Solan (H. P.), 19-4-1970 ; coll. *M. C.*

Tricentrus longiceps n. sp.

(Pl. XXVIII)

Female : General coloration rusty brown ; head vertical, brownish with black spots, two and three fourths as wide as long, densely pilose, upper margin slightly arcuate, lower margins strongly sloping to frontoclypeus, eyes subglobose, pinkish with black shades, ocelli hyaline slightly nearer to each other than to eyes and located well above the centro-ocular line ; frontoclypeus densely pilose with silvery hairs, extending more than three-fourths of its length below lower margins of vertex, apex slightly expanded and truncate ; lateral margins somewhat concave ; fronto-clypeal lobes short but distinct ; pronotum rusty brown above and at sides, metopidium vertical, thrice as wide as high, densely pilose, supra-ocular callosities black, oval and bare ; humeral angles darker than bases of horns, tips broadly rounded ; suprahumeral horns tawny brown and thickly hairy at basal half, shaded with black at apical one-third, broadly based, tricarinate, nearly as long as distance between bases, viewed from sides directed upwards, viewed from above broad and directed outwards, in frontal view appearing narrower and directed outwards and forwards, tips acute ; posterior process strongly tricarinate, the dorsal carina black and percurrent through metopidium, apex marooned with black, tip acute, reaching the posterior angle of the inner margin of tegmina. Tegmina rusty brown, thrice as long as wide, apical limb narrow, tip narrowly rounded, basal sixth darker, coriaceous, punctate with a pale white rounded fascia, 1st apical cell about 10 times as long as wide, costal margin opposite to 1st apical cell not thickened, 1st discoidal cell not petiolate, longer than 2nd ; abdomen dark reddish brown ; legs entirely tawny brown.

Measurements ; Length from frontal margin to tips of tegmina 5.7 mm. , to tip of posterior process 4.1 mm. ; width across tips of suprahumeral horns 3.4 mm. , at humeral angles 3.0 mm. , at eyes 2.8 mm.

Male : unknown.

This species is closely allied to *pilosus* Ananthasub. & Ananthak. and *cornutus* n. sp. in the general coloration and size and in the presence of a pale fascia on the basal sixth of tegmina, but differs from *pilosus* in the nature of the frontoclypeus which extends to more than three-fourths of its length below lower margins of vertex and in the first discoidal cell of tegmina distinctly longer than the second ; it differs from *cornutus* in the nature of the prothoracic tergum and horns.

Material studied : Female holotype Reg. No. Z. S. I. 681/H15 from Collem, Goa, 3-4-1966, Coll. Pradhan and party (Z.S.I. Goa Survey, 1966).

Tricentrus varicornis n. sp.

(Pl. XXIX)

Female : General coloration purplish brown ; head greyish, nearly three times as wide as long, slightly arcuate, sparsely pilose, supraocular callosities prominent, frontoclypeus extending three-fourths of its length below lower margins of vertex, tip broadly rounded and thickly hairy ; frontoclypeal lobes inconspicuous ; eyes pale yellowish, ocelli pale white, located on the centro-ocular line, closer to eyes than to each other ; pronotum reddish brown, metopidium vertical, reddish brown, moderately hairy, about twice as wide as high, supraocular callosities conspicuous, greyish brown, humeral angles black, their tips blunt ; suprahumeral horns robust, about one and a half times as long as space between their bases and exhibit variations, longly pilose. projecting obliquely forwards and upwards, viewed from behind inclined outwards and forwards, tips broadly rounded and subacute, lateral carina strongly developed and jet black ; posterior process short, tricarinate, lateral carinae weak, dorsal carina percurrent through metopidium, tip acute, black, never reaching the posterior angle of the inner margin of tegmina. Tegmina purplish brown, fringed with short hairs, nearly 2.3 times longer than wide, 1st apical cell five times longer than width at base, 1st discoidal cell petiolate, shorter than 2nd discoidal cell ; legs densely pilose, distal third of femora and the whole of tibiae and tarsi pale white ; abdomen black.

Measurements : Length from frontal margin to tips of tegmina 5 mm., to tip of posterior process 3.1 mm. ; width across tips of horns 2.75 mm., at humeral angles 2 mm., at eyes 1.35 mm.

Male : unknown.

This species is close to *purpureus* Ananthasub. & Ananthak. in the general coloration and suprahumeral horns, but differs from it in the smaller body size, in the longer and stouter suprahumeral horns and in the nature of the frontoclypeus.

Material examined : Holotype female Reg. No. Z. S. I. 682/H15 from Tenga River bed, near Mt. Brigade, 18-12-1965., Z. S. I. & D. R. D. O. Joint NEFA Survey ; 2 paratype females Reg. No. Z. S. I. 683/H15-684/H15 from Wokro, NEFA, India, 1200 m., 2-12-1970 ; coll. Dr. J. M. Julka.

Tribe GARGARINI Distant
Genus **Gargara** Amyot & Serville
Gargara discoidalis n. sp.
(Pl. XXX)

Female : General coloration rusty brown ; head declivous, nearly thrice as wide as long, light brown, densely pilose with adpressed golden hairs ; upper margin of vertex slightly arcuate, lower margins broadly rounded and gradually

sloping to frontoclypeus ; eyes subglobose, reddish brown, ocelli black, closer to eyes than to each other and situated above the centro-ocular line ; frontoclypeus light brown, extending about one half of its length below the lower margins of vertex, frontoclypeal lobes entirely fused upon tips, tip of frontoclypeus broadly rounded and fringed with longer pilosity ; pronotum rusty brown, metopidium greyish brown, convex at basal half and obliquely turned backwards to disc, punctate with golden hairs, disc convex and punctate, humeral angles prominent, tips subacute ; posterior process greyish brown, arising from behind disc and a little ampliate in middle, basally broad and hollow ventrally, tricarinate, median carina finely percurrent through metopidium, terminal one-fourth black and raised a little above tegmina, tip acute reaching upto the middle of 5th apical cell. Tegmina semihyaline, about two and one-fourths as long as wide, tip broadly rounded, apical limb broad, extreme base coriaceous and punctate, veins pinkish brown,, R1 and rs reddish brown, chitinised forming an incipient pterostigma, 5 apical and 3 discoidal cells, 1st apical cell 10 times as long as wide, 1st discoidal cell not petiolate, 2nd and 3rd discoidal cells of equal size ; legs light brown ; abdomen reddish brown.

Measurements : Length from frontal margin to tips of tegmina 3.8 mm., to tip of posterior process 2.8 mm. ; width across tips of humeral angles 2 mm., at eyes 1.75 mm.

Male : unknown.

This species is allied to *rustica* Ananthasub. & Ananthak, in the general color, in the nature of tegmina, etc. but distinctly differs in the presence of an incipient pterostigma and a 3rd discoidal cell,

Material examined : Holotype female Reg. No. Z. S. I. 685/H15 from Manoharpur, Bihar, India, 29-12-1967, coll. *Raj Tilak*.

***Gargara nigrolimbata* n. sp.**

(Pl. XXXI)

Male : General coloration dark brown ; head reddish brown, thrice as wide as long thickly pilose, upper margin of vertex arcuate, lower margins broadly rounded and sloping to frontoclypeus ; frontoclypeus broadly rounded, extending about one half of its length below lower margins of vertex, with basal lobes fused throughout their length, thickly hairy, tip nearly truncate ; eyes subglobose, dark brown, ocelli brown, nearer to eyes than to each other and situated on the centro-ocular line ; pronotum dark brown, lateral parts cretaceously sericeous, metopidium vertical, convex in front, finely punctate with silvery hairs, humeral angles moderately large, tips blunt, supraocular callosities broken, jet black ; posterior process black, not raised above the level of disc, rather parallel-sided upto three-fourths of its length, apex obtuse

impinging on tegmina and reaching the clavus of tegmina, lateral carinae obscure in pronotum, median carina distinct and finely percurrent on metopidium, scutellum aborted in middle ; tegmina nearly two and a half times as long as wide, fuscous brown, mottled with black on veins bordering 2nd apical cell ; apical limbus broad, mottled with black patches ; 1st apical cell 8 times as long as wide, 1st discoidal cell petiolate, much smaller than 2nd, legs upto femora dark brown, rest greyish brown ; abdomen dark brown ; genitalia black.

Measurements : Length from frontal margin to tips of tegmina 4.4 mm., to tip of posterior process 2.8 mm. ; width across tips of humeral angles 2.6 mm., at eyes 2.2 mm.

Female : unknown.

This species is closely related to *albitarsis* Ananthasub. & Ananthak. in the coloration, in the nature of posterior process and in the petiolate 1st discoidal cell of tegmina, but differs from it in the characteristically mottled spots and patches on tegmina.

Material examined : Male holotype Reg. No. Z. S. I. 686/H15 from Wakro, NEFA, India, Z. S. I. Daphabum Expedition, Nov. 1969-Jan. 1970, coll. Dr. J. M. Julka.

Gargara brevis n. sp.

(Pl. XXXII)

Female : General coloration black ; head greyish black, two and a half times as wide as long, sprinkled with adpressed silvery hairs ; upper margin of vertex slightly arcuate, lower margins of vertex broadly rounded, sloping to frontoclypeus ; frontoclypeus broader than long, highly hairy, tip broadly rounded, basal lobes entirely fused and inconspicuous ; eyes dark brown, subglobose, ocelli black, nearer to eyes than to each other and situated slightly above the centro-ocular line ; pronotum black, lateral margins greyish black, thickly pilose, metopidium black, vertical, nearly twice as wide as high, finely granulate, disc convex, slightly elevated, granulate and punctate with silvery hairs ; humeral angles subconical, tips broadly rounded and sparsely hairy ; posterior process short, extending only upto the second anal vein, black strongly tricarinate, median carina finely percurrent through metopidium, tip subacute, impinging on tegminal margin. Tegmina light pinkish brown with yellowish veins, nearly two and three-fourths as long as wide, apex broadly rounded, apical limbus broad with a black patch opposite to 3rd apical cell and another black patch on the posterior angle of inner margin, 1st apical cell nearly 5 times as long as maximum width, 1st discoidal cell petiolate, much smaller than 2nd discoidal cell ; in the tupe an incipient cross vein between subcosta and radius and the median delaminated at distal half ; legs entirely dark brown ; abdomen black.

Measurements : Length from frontal margin to tips of tegmina 4.0 mm., to tip of posterior process 2.4 mm. ; width across tips of humeral angles 2.3 mm., at eyes 1.9 mm.

This species is allied to *robusta* Distant in the body coloration, in the nature of the posterior process and in the presence of the two black patches in the apical limb of tegmina, but differs from it in the shorter posterior process and in the petiolate 1st discoidal cell which is much smaller than the 2nd.

Material examined : Female holotype Reg. No. Z. S. I. 687/H 15 from Belur, Howrah Dist., West Bengal, India, 14-1-1966, coll. *T R. Mitra and party.*

Genus *Gargarina* gen. nov.

Near to *Gargara* Amyot & Serville but differing from it in the pronotum elevated at the disc, the dorsal carina of the posterior process raised above the level of disc in having distinct frontoclypeal lobes which are not fused with frontoclypeus.

Head vertical, two times wider across extremities of eyes than length of vertex ; vertex about one and a half wider than long ; eyes nearly subglobose, ocelli closer to eyes than to each other and situated on the centro-ocular line ; frontoclypeus extending more than its length below lower margins of vertex, its lobes distinct and fused to frontoclypeus.

Pronotum elevated at the disc, metopidium convex and backwardly sloping, disc convex, without suprahumeral horns, with a pair of granulated rounded knobs ; humeral angles prominent, blunt ; posterior process fitting tightly against scutellum and contiguous with tegmina, reaching the anal angles of tegmina, with a strong dorsal carina extending to the tip. Scutellum triangular, deeply excavated at tip, incompletely chitinised in middle which is hidden by posterior process. Tegmina about two and a half times longer than wide, with 5 apical and 2 discoidal cell, pterostigma absent ; hind wings with 3 apical cells.

Type of the genus : *Gargarina carinata* n. sp.

***Gargarina carinata* n. sp.**

(Pl. XXXIII)

Male : As in the generic description with the following additional characters : General coloration dark castaneous ; head dark brown, vertex finely punctate with short adpressed golden pilosity ; eyes reddish brown, rather obliquely subglobose, ocelli succineous ; frontoclypeus densely longly pilose, its lobes shortly pilose, tip broadly rounded, extending a little beyond frontoclypeal lobes ; pronotum coarsely granulate with golden hairs, supraocular callosi-

ties circular, large, impunctate, black ; metopidium nearly 1.5 times wider than high, sparsely tuberculate, disc dark castaneous with long golden hairs, gradually rising backwards to posterior process ; posterior process strongly dorsally keeled, tip bluntly acute and slightly elevated above anal angles of tegmina ; lateral margins of scutellum sericeous ; tegmina smoky brown, veins reddish brown, basal sixth and costal margin coriaceous, 1st apical cell about 7 times longer than its maximum width, 1st discoidal larger than 2nd ; apical limb fairly broad, tips rounded ; sides of thorax black ; legs pale black ; abdomen concolorous with thorax.

Measurements : Length from frontal margin to tips of tegmina 6.0 mm., to tip of posterior process 3.6 mm. ; width across tips of humeral angles 3.1 mm., at eyes 2.6 mm.

Material examined : Holotype male, Reg. No. Z. S. I. 688/H 15 from NEFA, Subansiri Div., Tamen, 459 m., 26-5-'66.

KEY TO LETTERING OF FIGURES

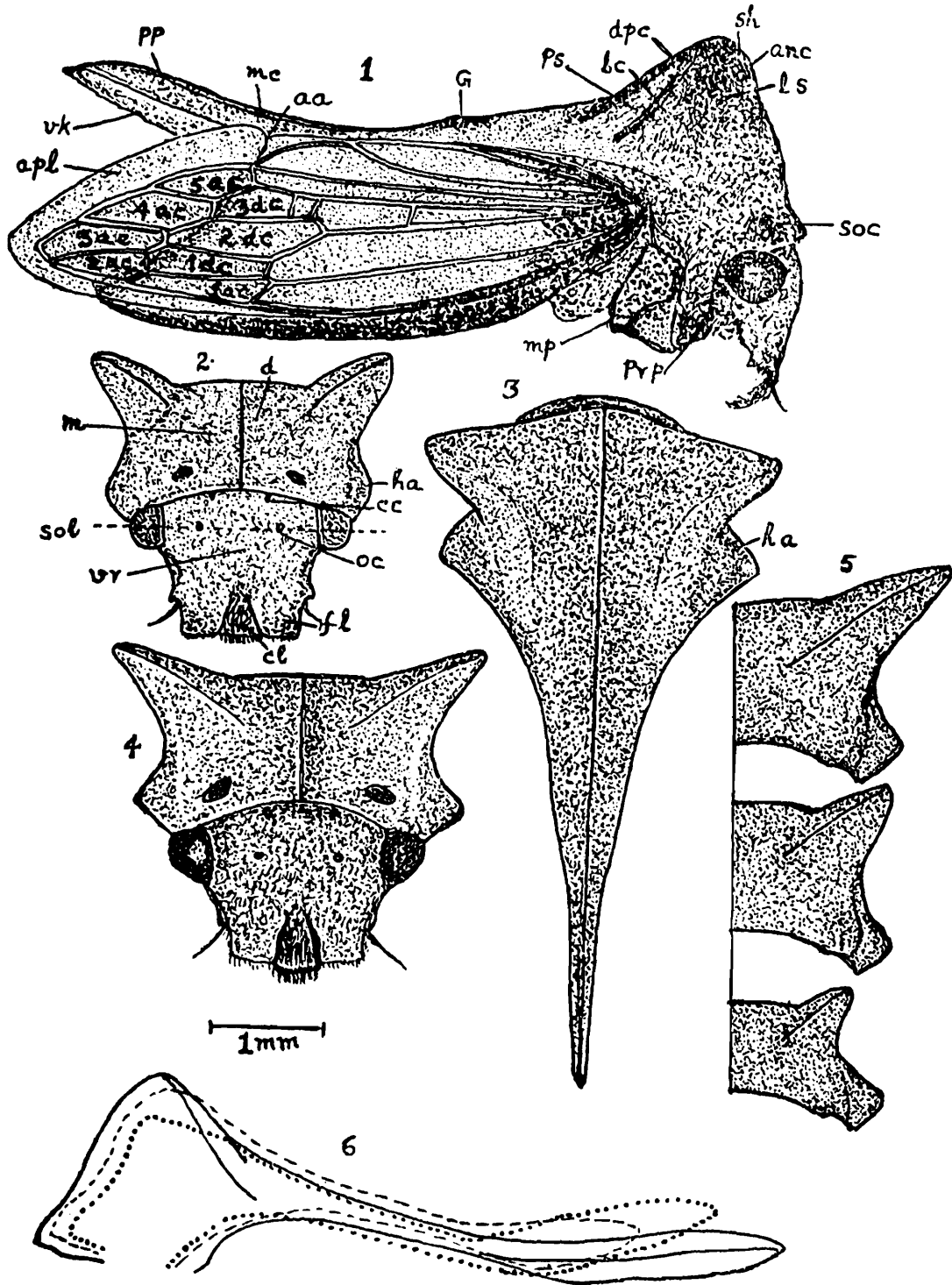
aa — anal angle of tegmina.	gr — genital rudiments.
1 ac— first apical cell.	ha — humeral angle.
2 ac— second apical cell.	lc — lateral carina.
3 ac— third apical cell.	ll — lateral lamellae.
4 ac— fourth apical cell.	ls — lateral surface.
5 ac— fifth apical cell.	lv — lateral valve.
ae — aedeagus.	m — metopidium.
an — antenna.	mc — median carina.
anc— anterior carina.	mp — mesopleural process.
apl — apical limbus.	oc — ocellus.
ar — anal ring.	pa — paramere.
at — anal tube.	pap— pronotal anterior process.
ca — costal angle of wing pad.	pp — posterior process.
cc — cranial callosity.	prp — propleural process.
cl — clypeus.	ps — posterior surface.
col — centro-ocular line.	r — rostrum
ct — cranial tubercle.	rt — retractile tube.
d — disc.	sh — suprahumeral horn.
1 dc— first discoidal cell.	shb — suprahumeral bud.
2 dc— second discoidal cell.	soc — supraocular callosity.
3 dc— third discoidal cell.	st — sternal plate.
dpc — dorso-posterior carina.	twp — tegminal wing pad.
fl — foliate lobe.	vk — ventral keel.
G — gibba.	vr — vertex.

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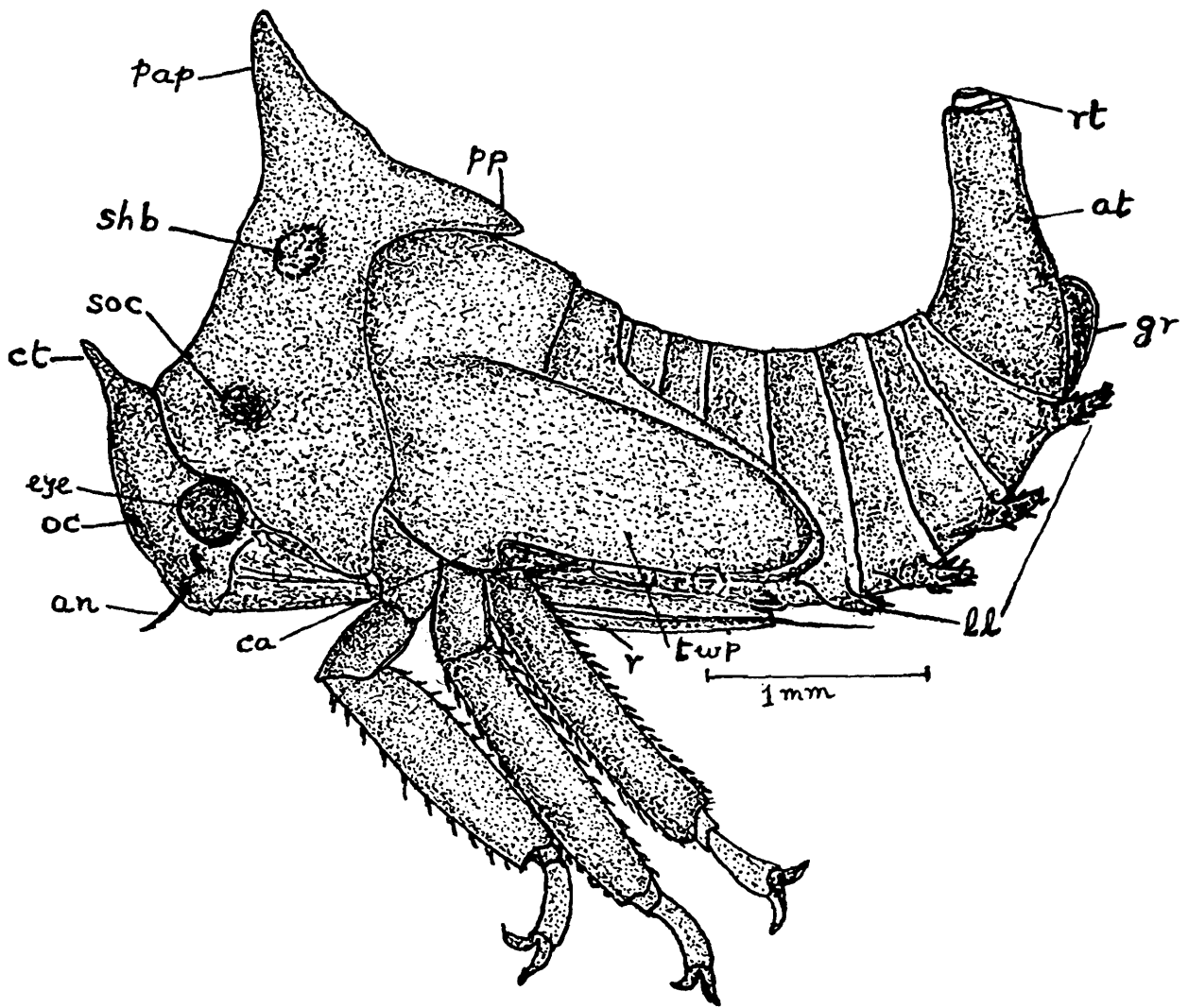
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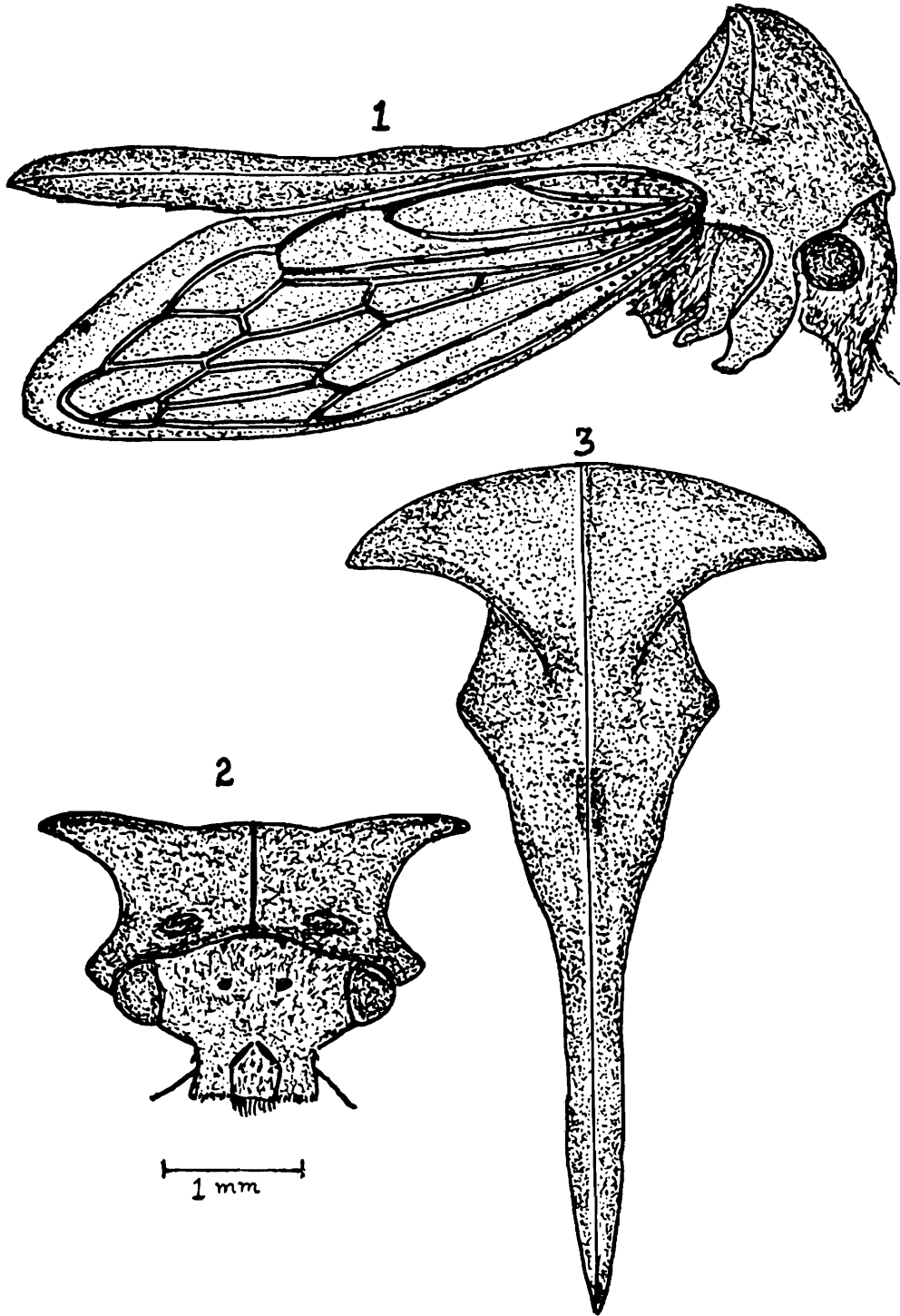


Figs. (1-6) *Oxyrhachis geniculata* n. sp.

1. ♀ Lateral view.
2. ♂ Frontal view.
3. ♀ Dorsal view of pronotum.
4. ♀ Frontal view.
5. Variations in suprahumeral bones in ♀
6. Variations in posterior process in ♀

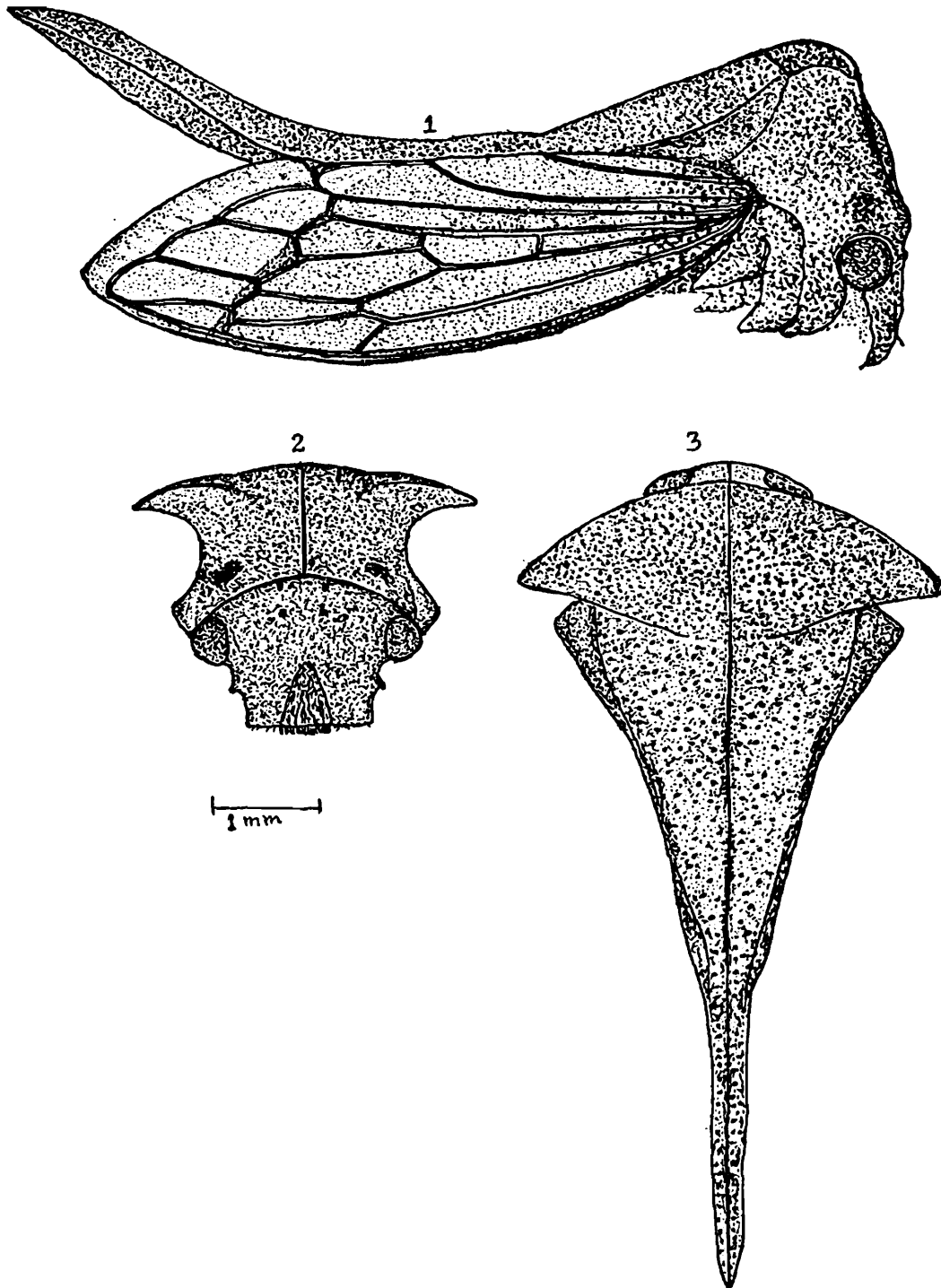


Oxyrhachis geniculata. Fifth instar nymph.



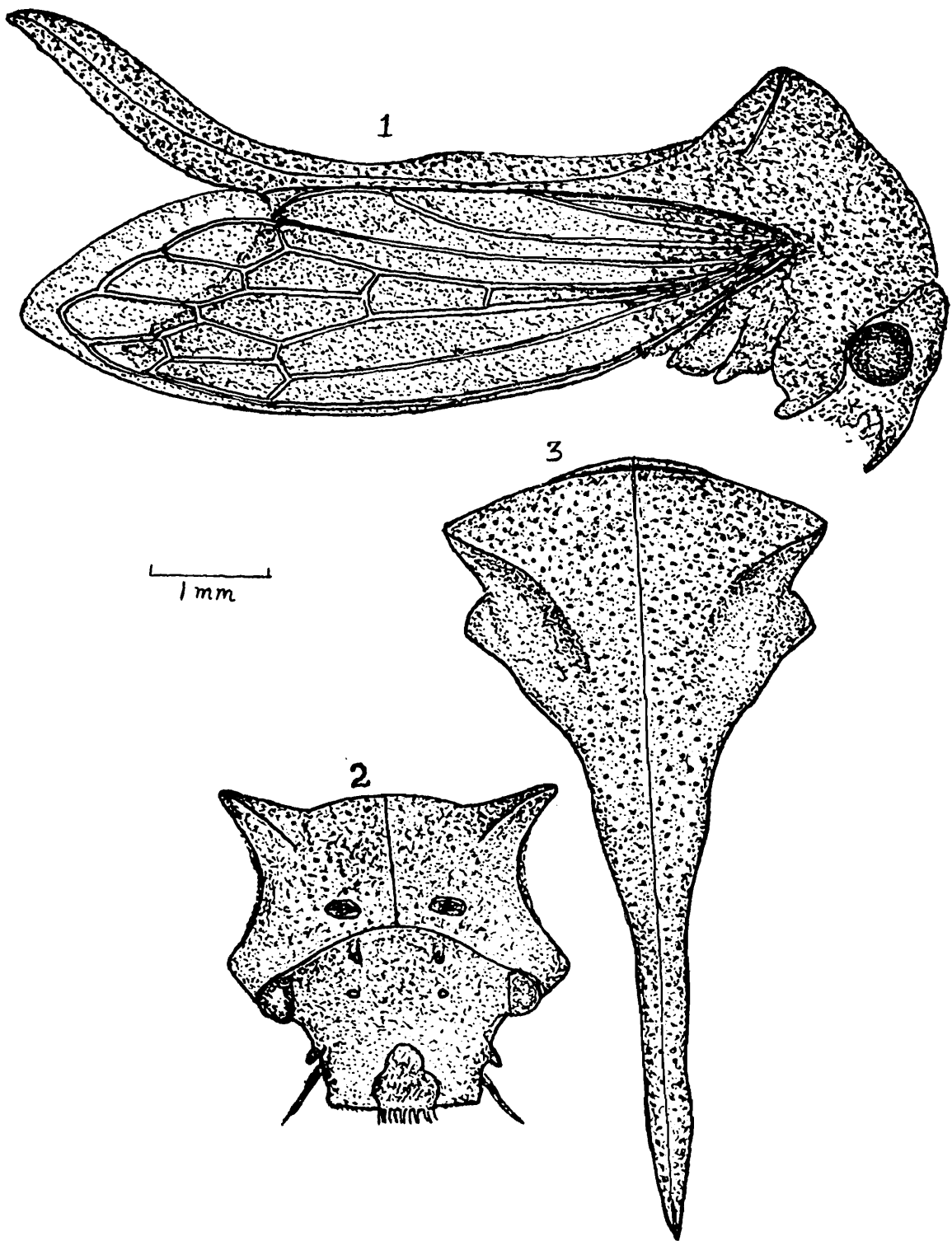
Figs. (1-3) *Oxyrhachis nigrodorsalis* n. sp., ♂

1. Lateral view.
2. Frontal view.
3. Dorsal view of pronotum.



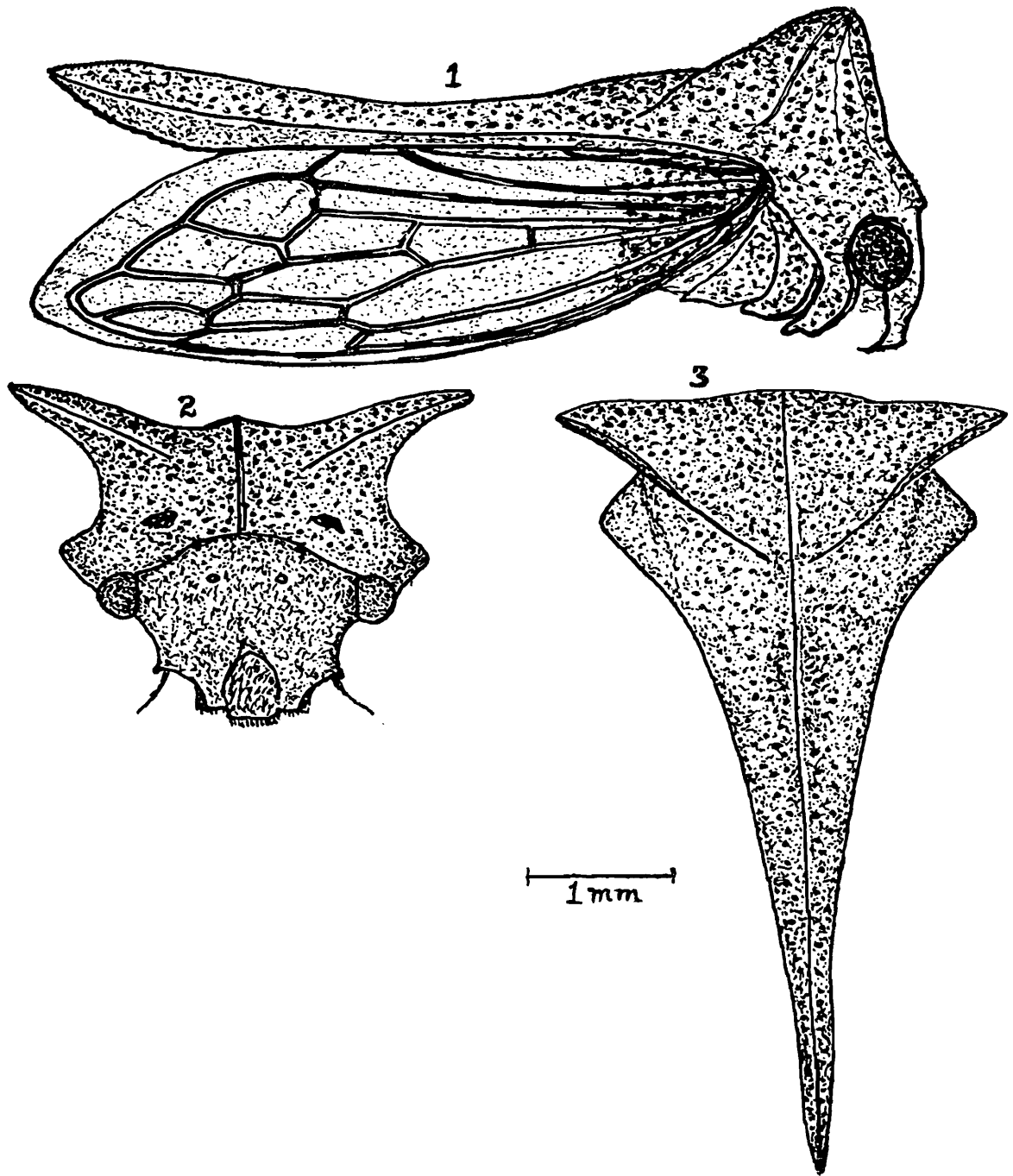
Figs. (1-3) *Oxyrhachis haldari* n. sp., ♀ .

1. Lateral view.
2. Frontal view.
3. Dorsal view of pronotum.



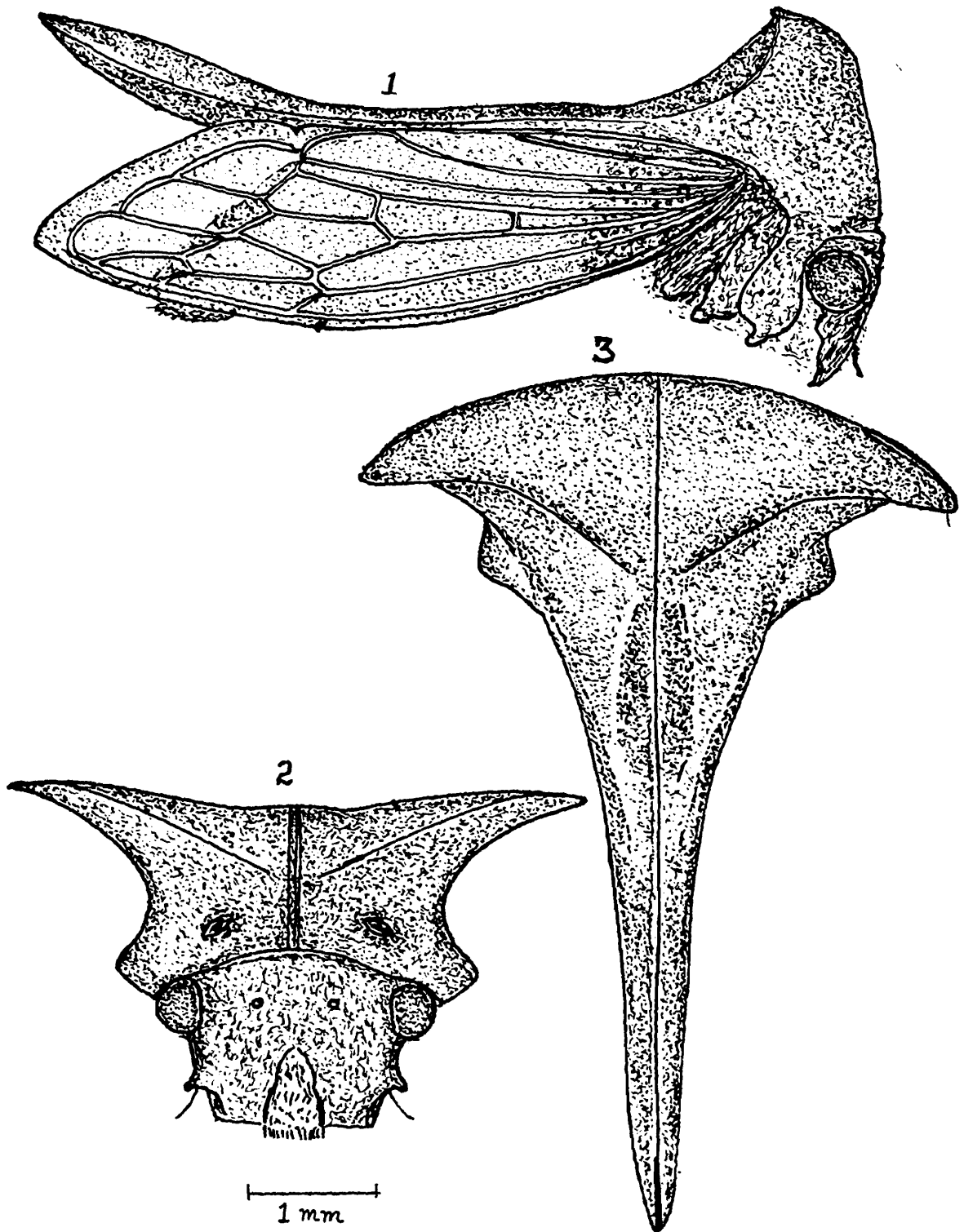
Figs. (1-3) *Oxyrhachis apicalis* n. sp., ♀

- 1. Lateral view.
- 2. Frontal view.
- 3. Dorsal view of pronotum.



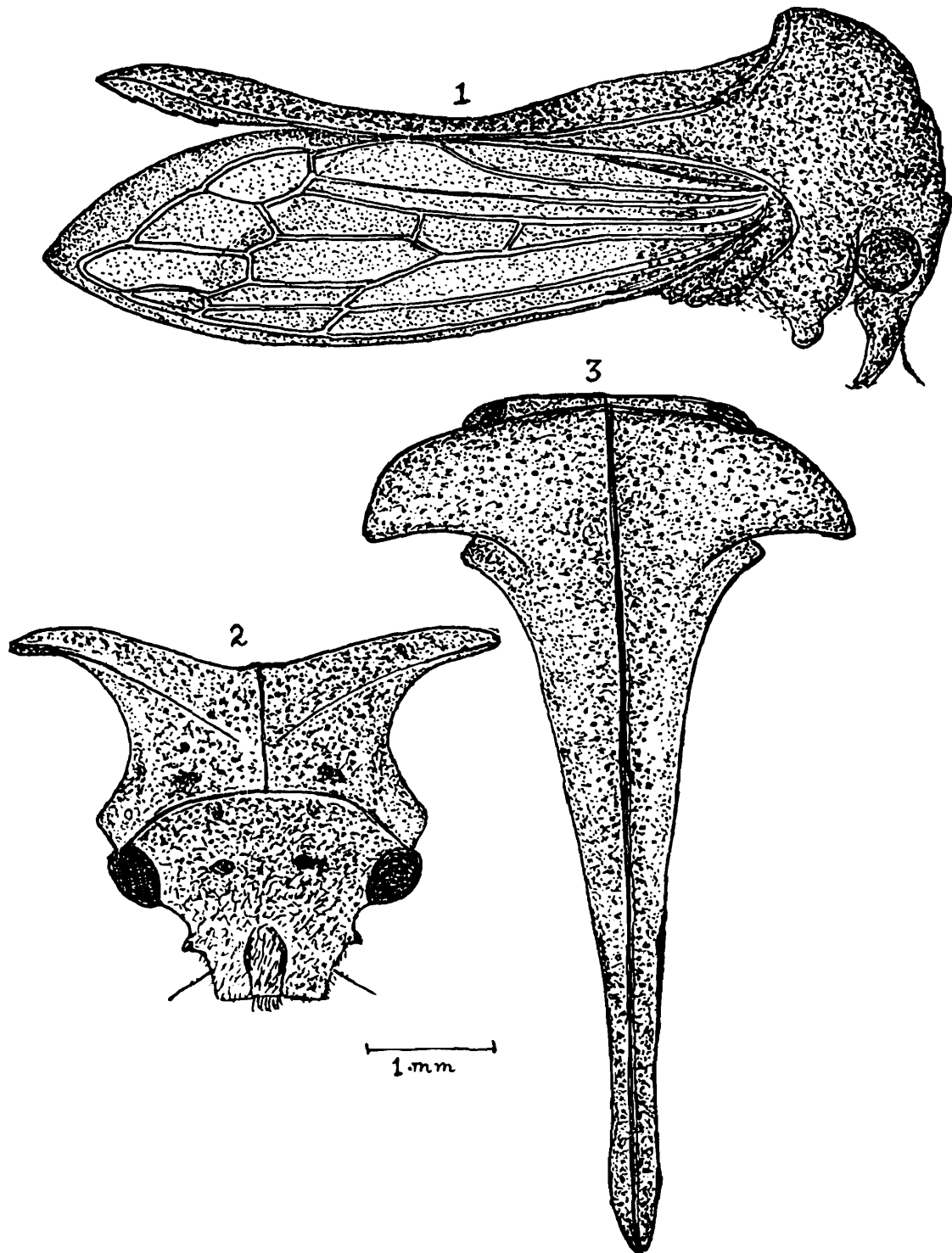
Figs. (1-3) *Oxyrhachis punctatus* n. sp., ♂

1. Lateral view.
2. Frontal view.
3. Dorsal view of pronotum.



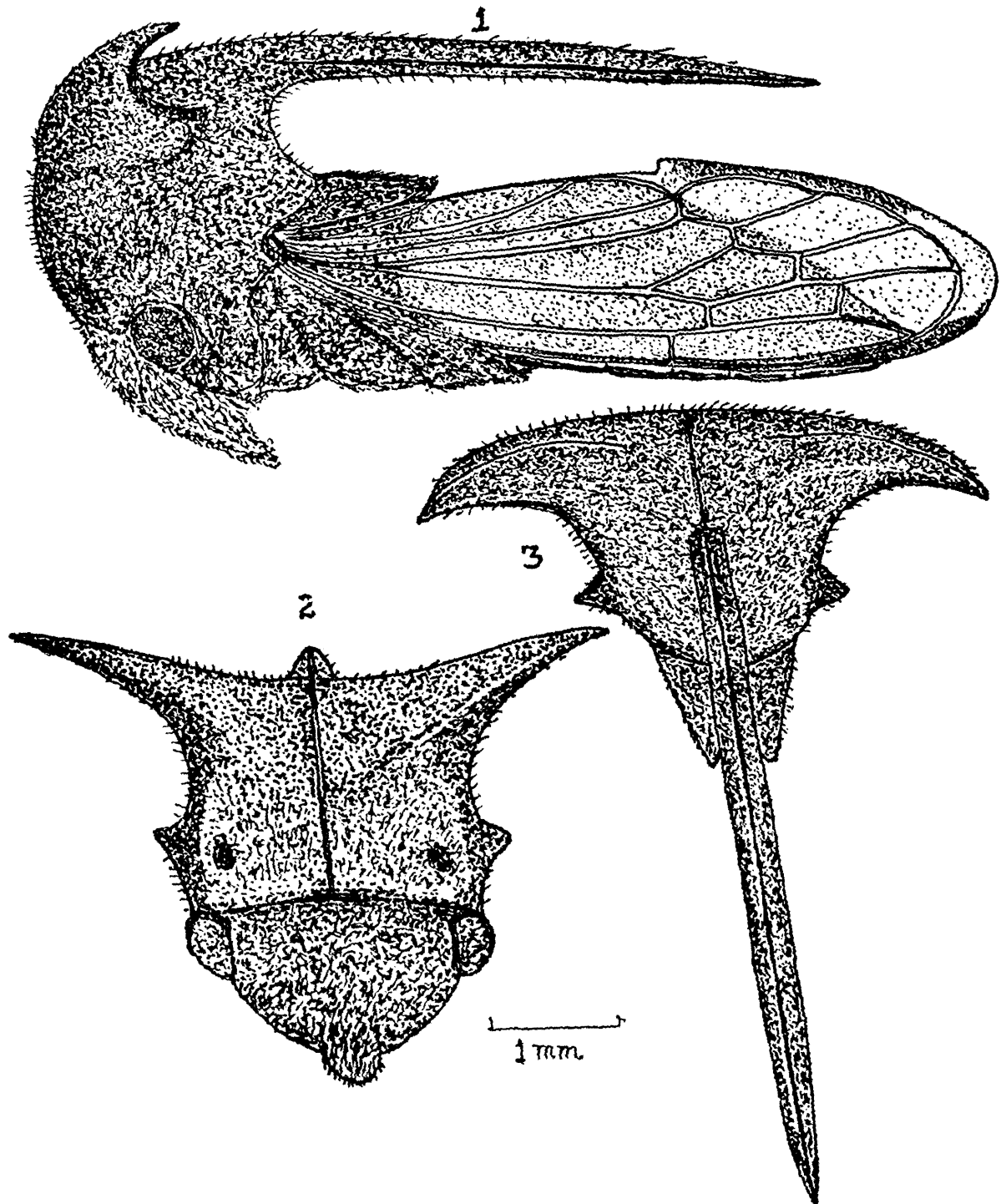
Figs. (1-3) *Oxyrhachis grandis* n. sp., ♂.

1. Lateral view.
2. Frontal view.
3. Dorsal view of pronotum.



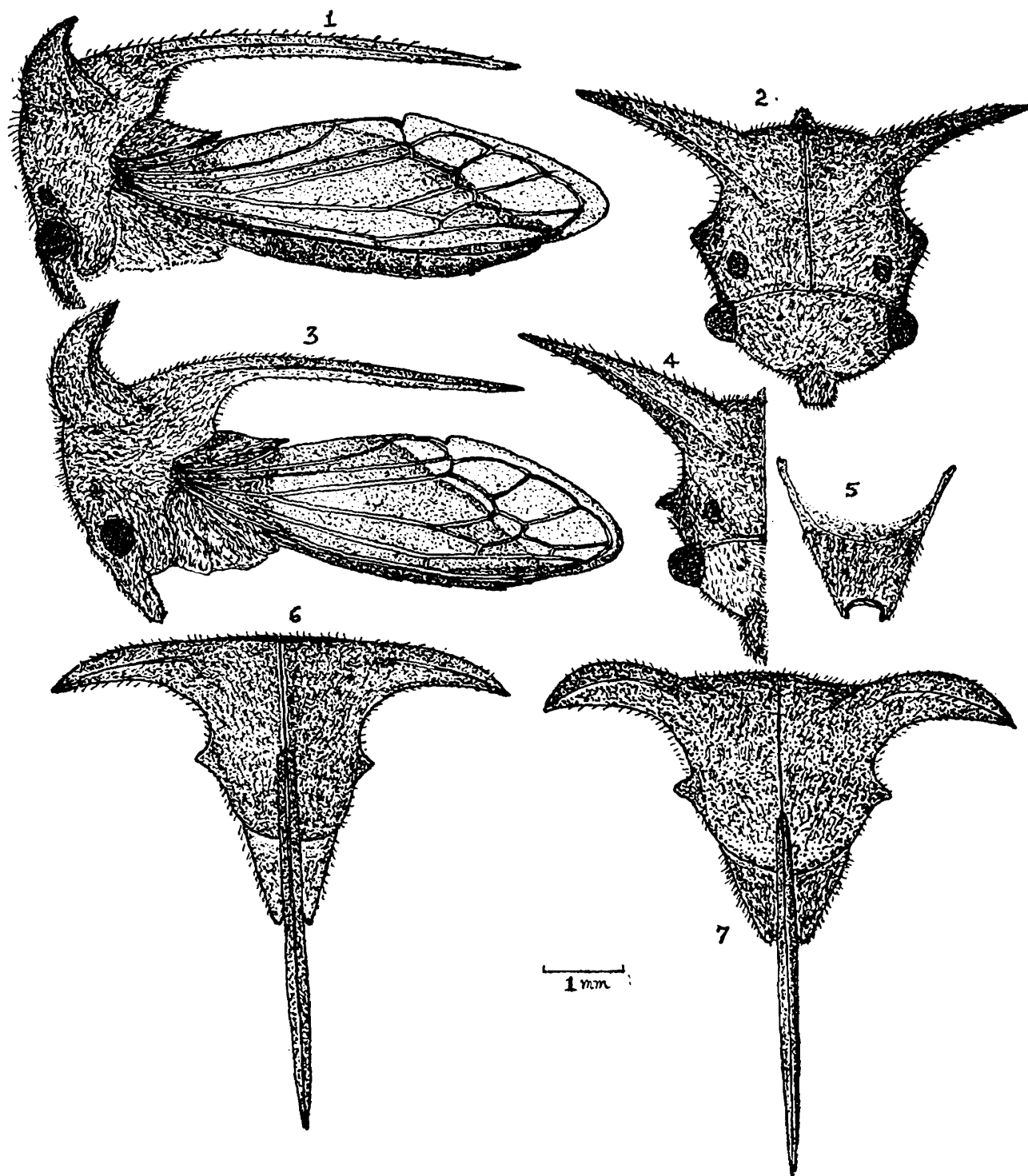
Figs. (1-3) *Oxyrhachis unicolor* n. sp., ♂.

1. Lateral view.
2. Frontal view.
3. Dorsal view of pronotum.



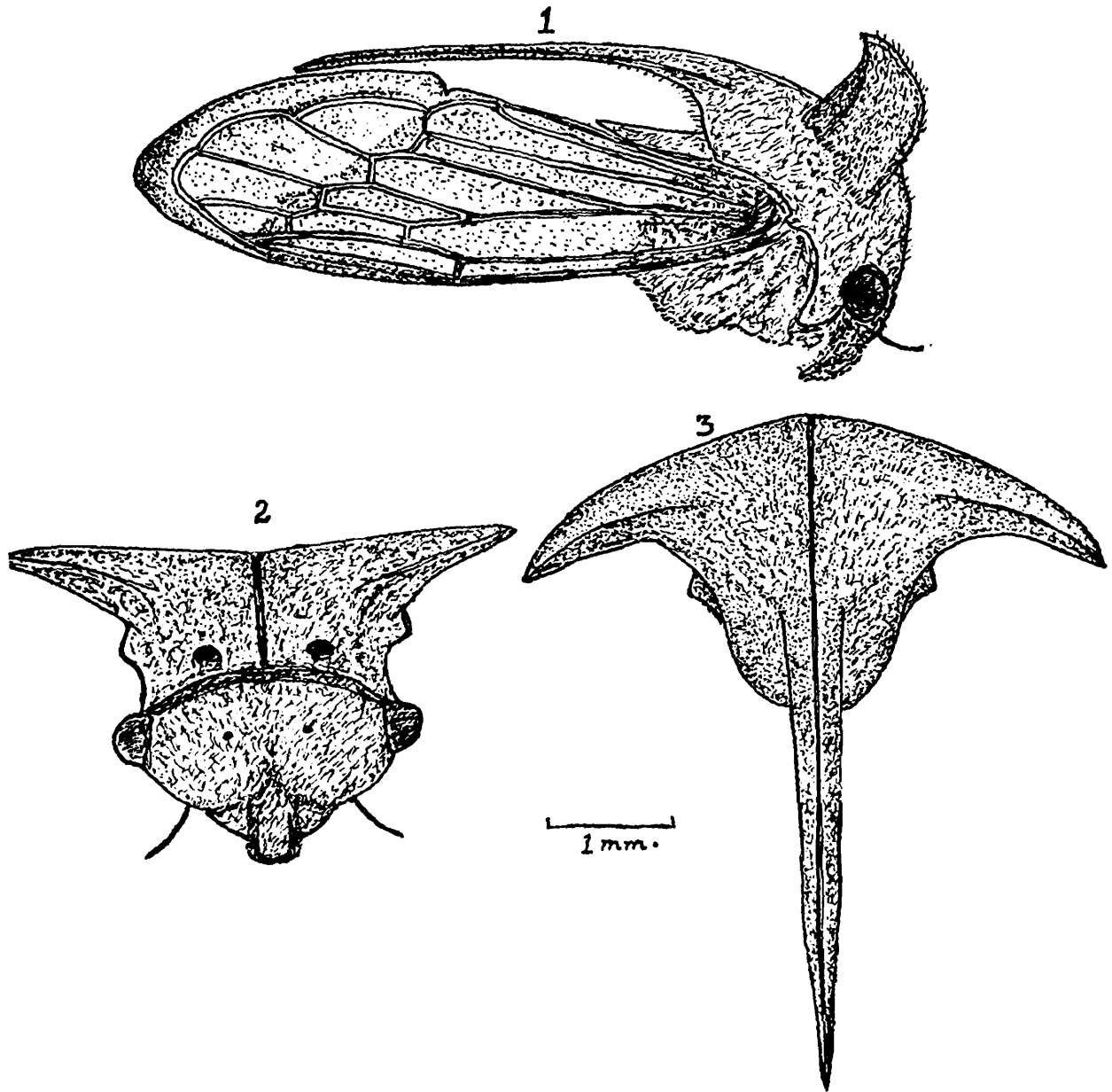
Figs. (1-3) *Leptocentrus rubrinigris* n. sp., ♂

- 1. Lateral view.
- 2. Frontal view.
- 3. Dorsal view of pronotum.



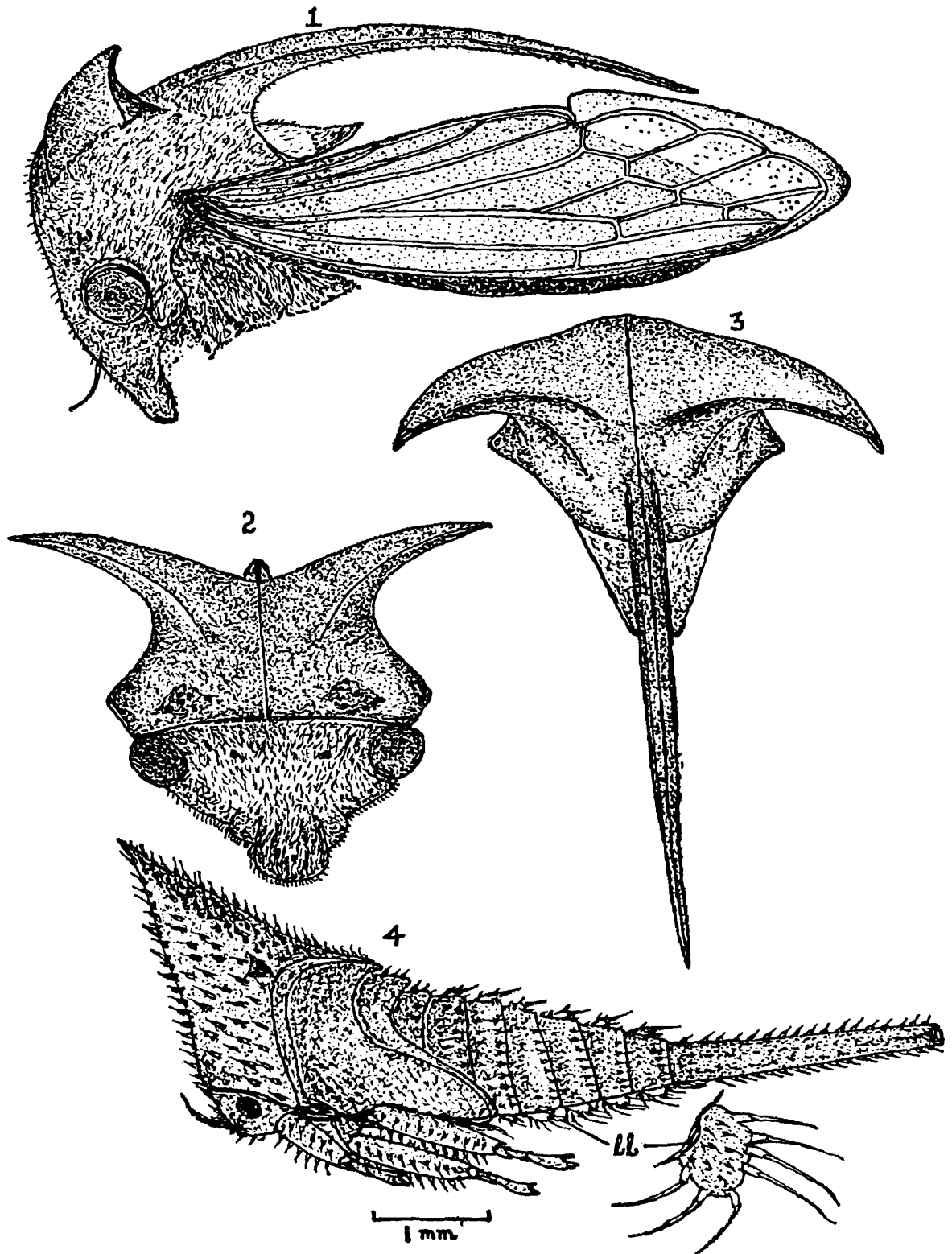
Figs. (1-7) *Leptocentrus carinatus* n. sp.

1. ♀ Lateral view.
2. ♀ Frontal view.
3. ♂ Lateral view.
4. ♂ Frontal view, left half.
5. Scutellum of ♀
6. ♀ Dorsal view of pronotum.
7. ♂ Dorsal view of pronotum.



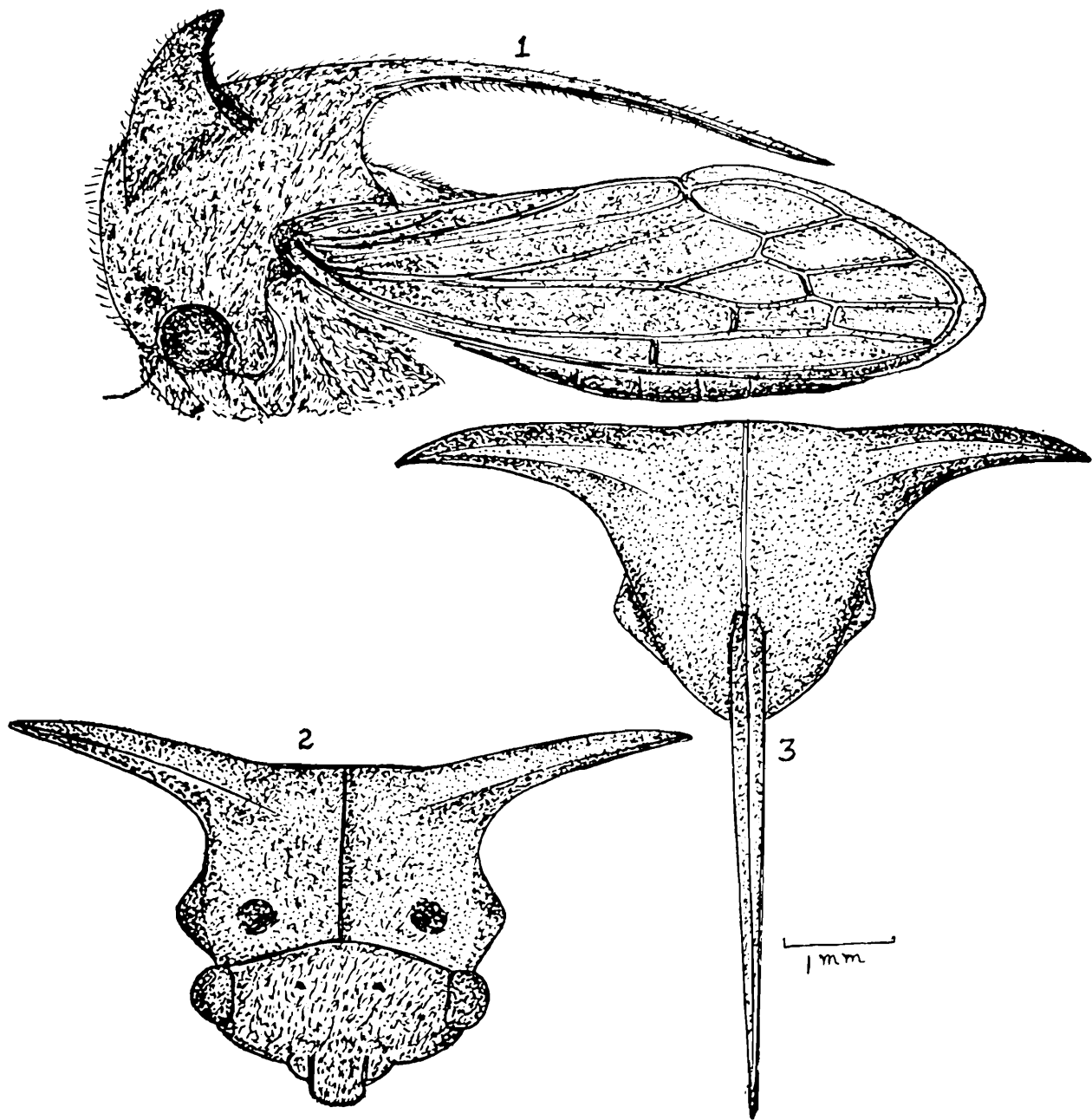
Figs. (1-3) *Leptocentrus rufescens* n. sp., ♂

1. Lateral view.
2. Frontal view.
3. Dorsal view of pronotum.



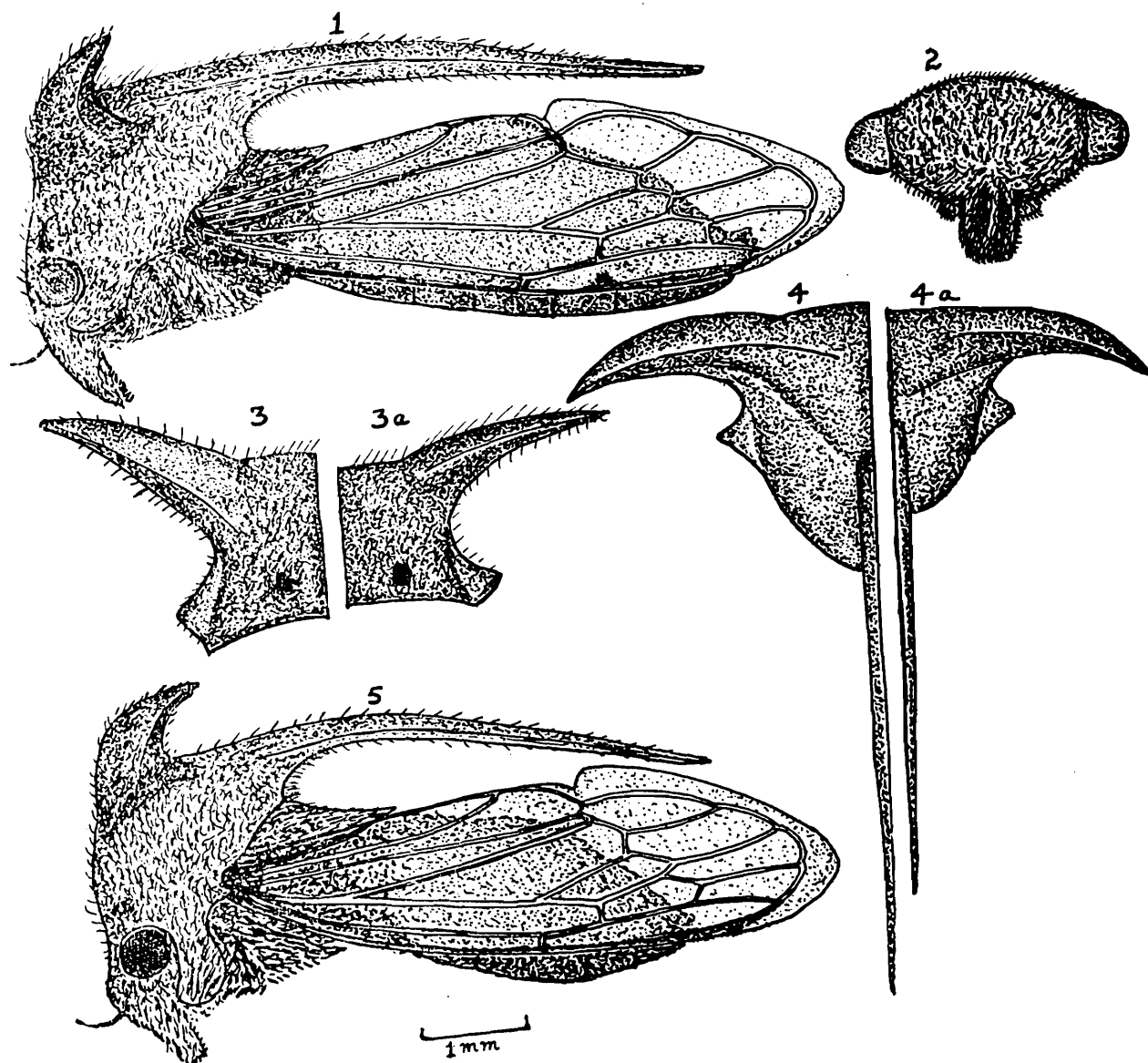
Figs. (1-4) *Leptocentrus acuticornis* n. sp., ♀

1. Lateral view.
2. Frontal view.
3. Dorsal view of pronotum.
4. Fifth instar nymph.



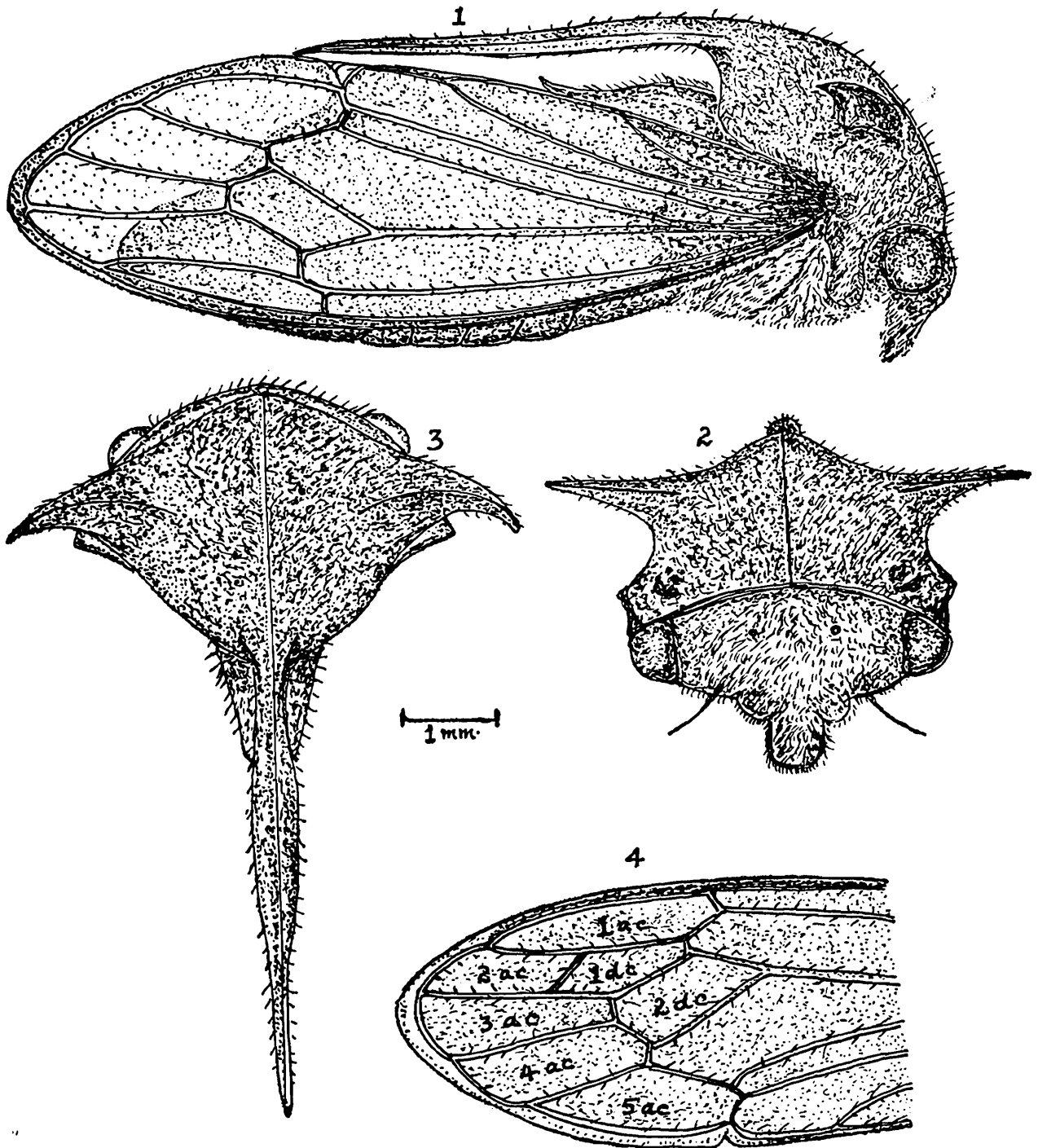
Figs. (1-3) *Leptocentrus splendens* n. sp., ♀ .

1. Lateral view.
2. Frontal view.
3. Dorsal view of pronotum.



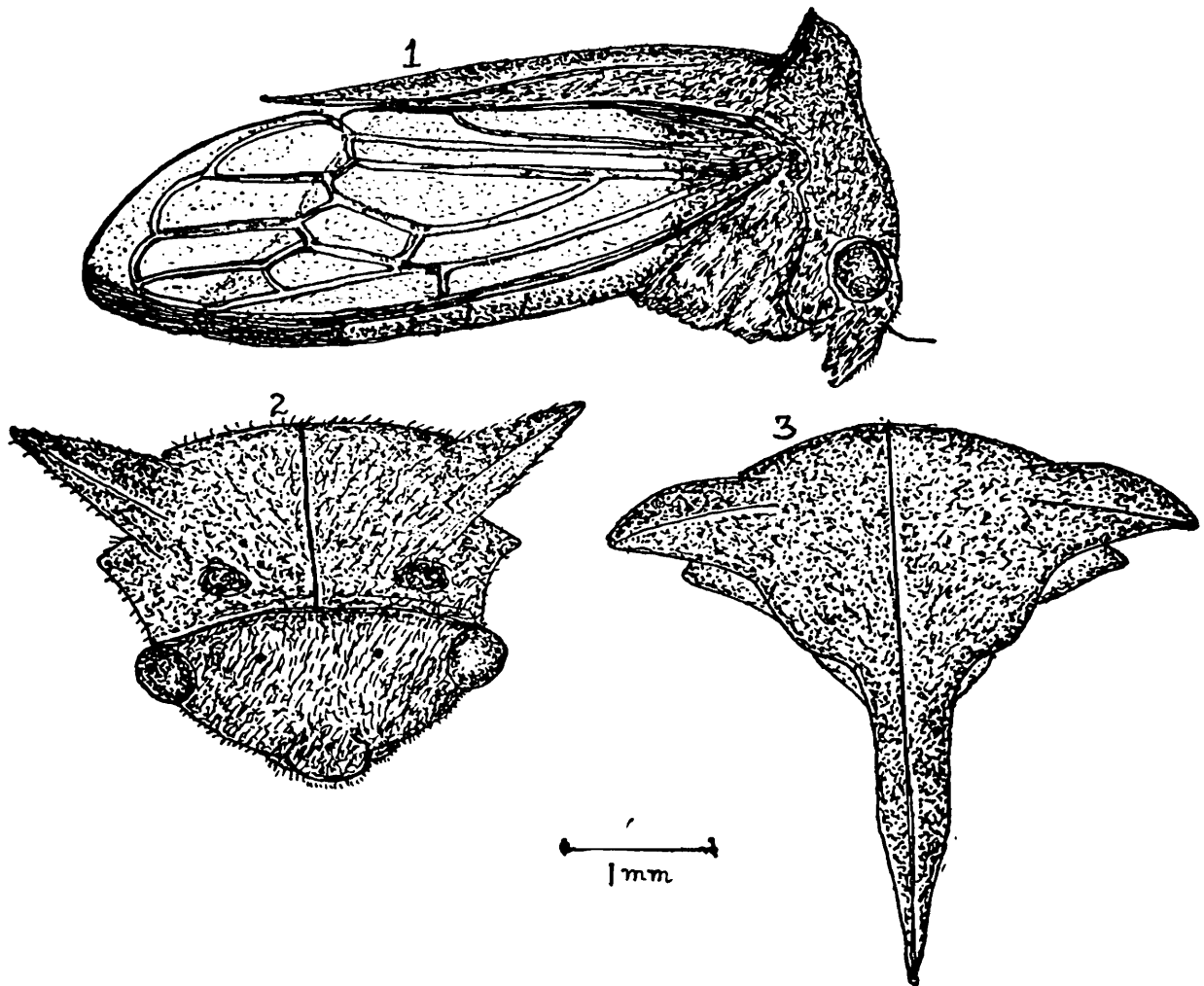
Figs. (1-5) *Leptocentrus beluri* n. sp.

- 1. ♀ Lateral view.
- 2. ♀ head.
- 3. ♀ Frontal view, left half.
- 3a. ♂ Frontal view, right half.
- 4. ♀ Dorsal view of pronotum, left half.
- 4a. ♂ Dorsal view of pronotum, right half.
- 5. ♂ Lateral view.



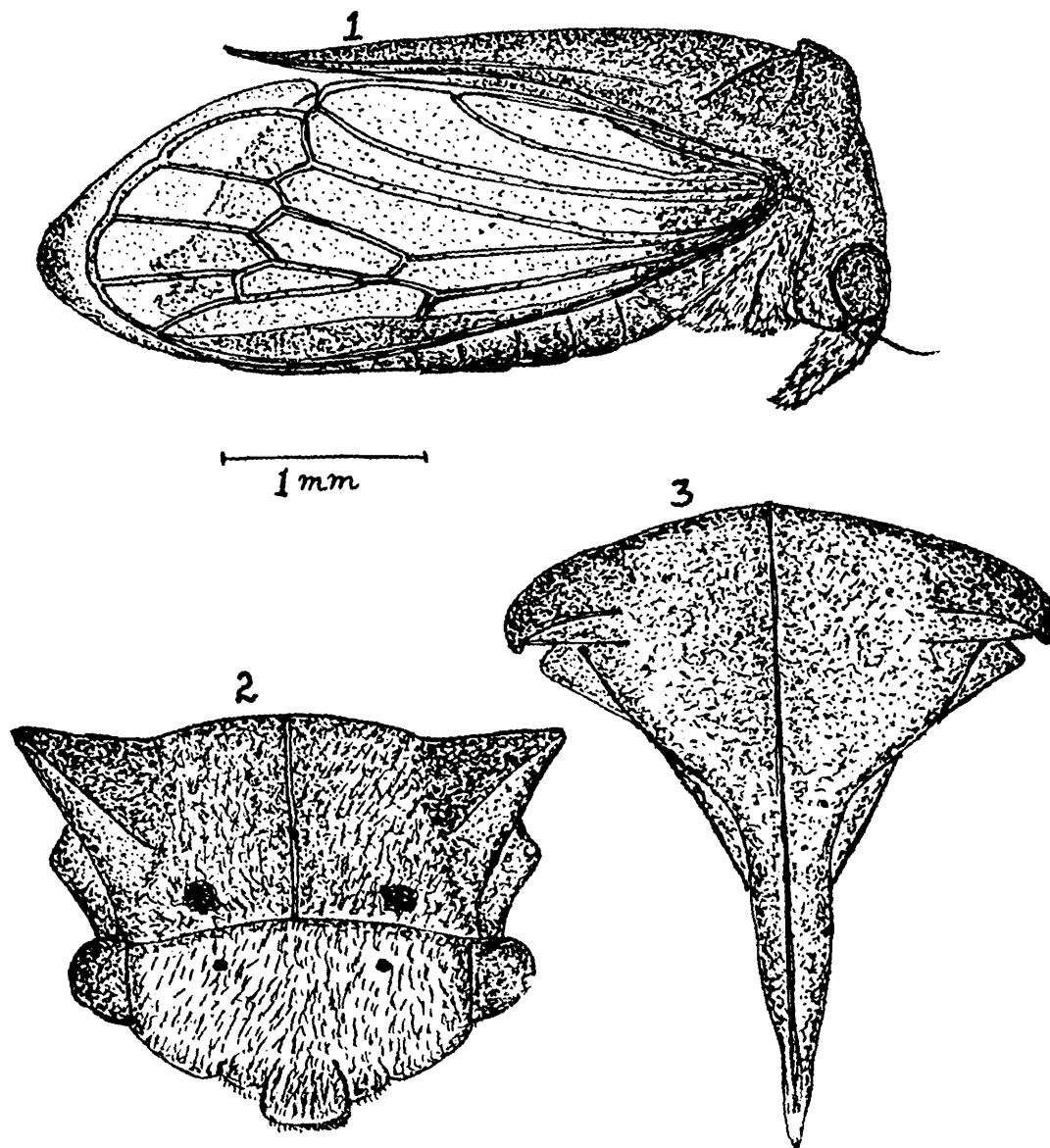
Figs. (1-4) *Leptocentrus luteus* n. sp., ♀.

1. Lateral view.
2. Frontal view.
3. Dorsal view of pronotum.
4. Tegmina, distal half.



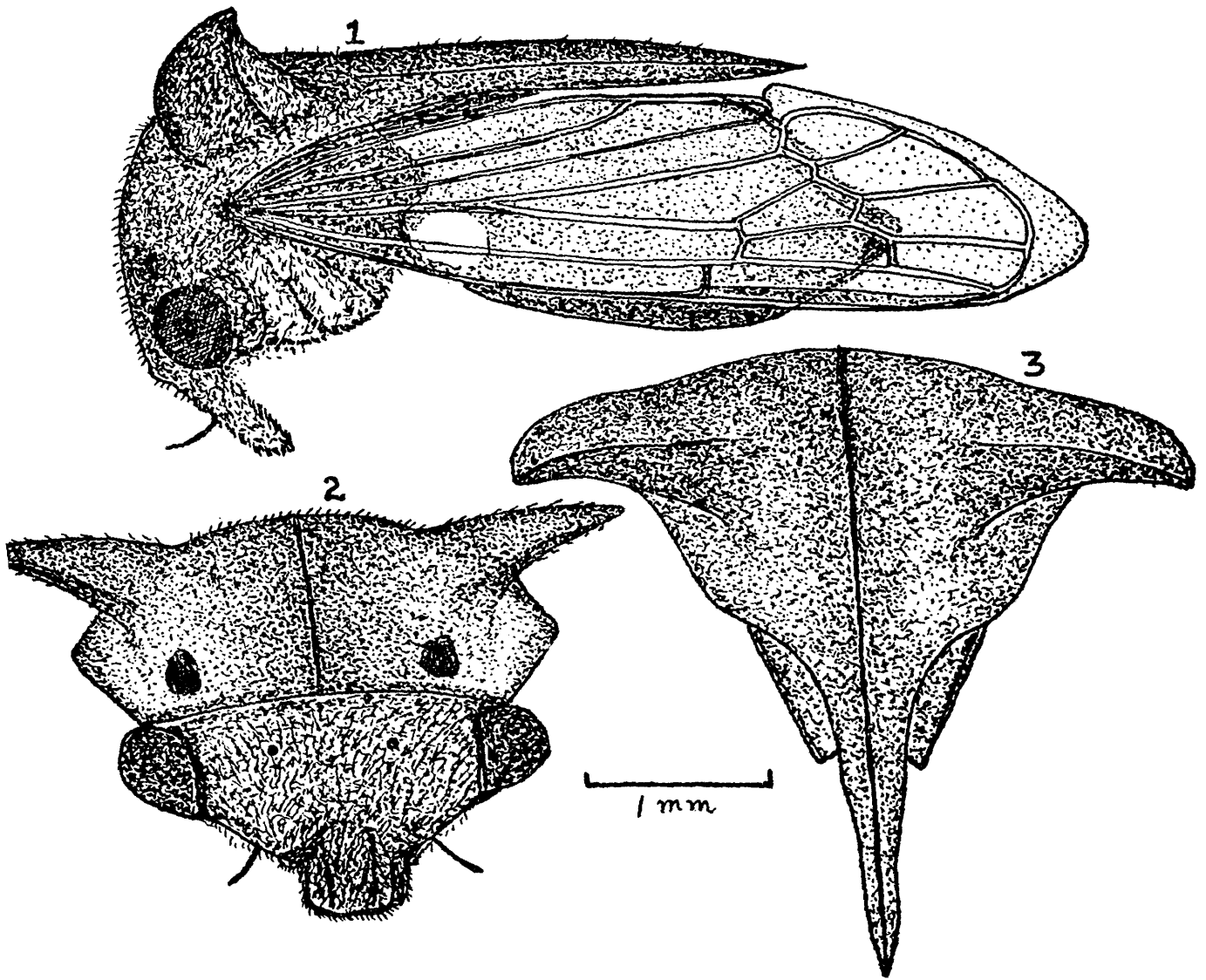
Figs. (1-3) *Tricentrus minomorii* n. sp., ♀ .

1. Lateral view.
2. Frontal view.
3. Dorsal view of pronotum.



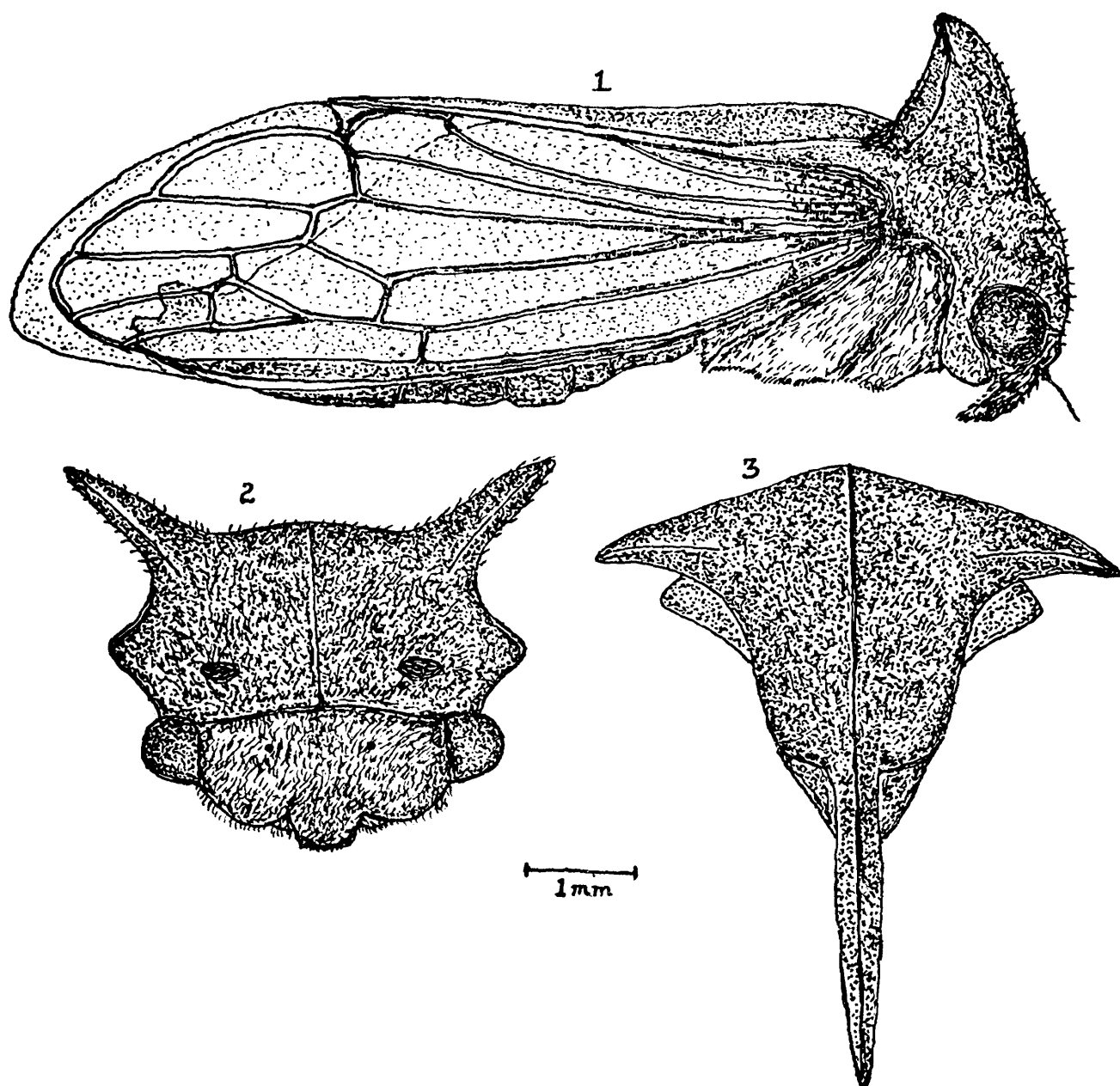
Figs. (1-3) *Tricentrus longicornis* n. sp., ♀

1. Lateral view.
2. Frontal view.
3. Dorsal view of pronotum.



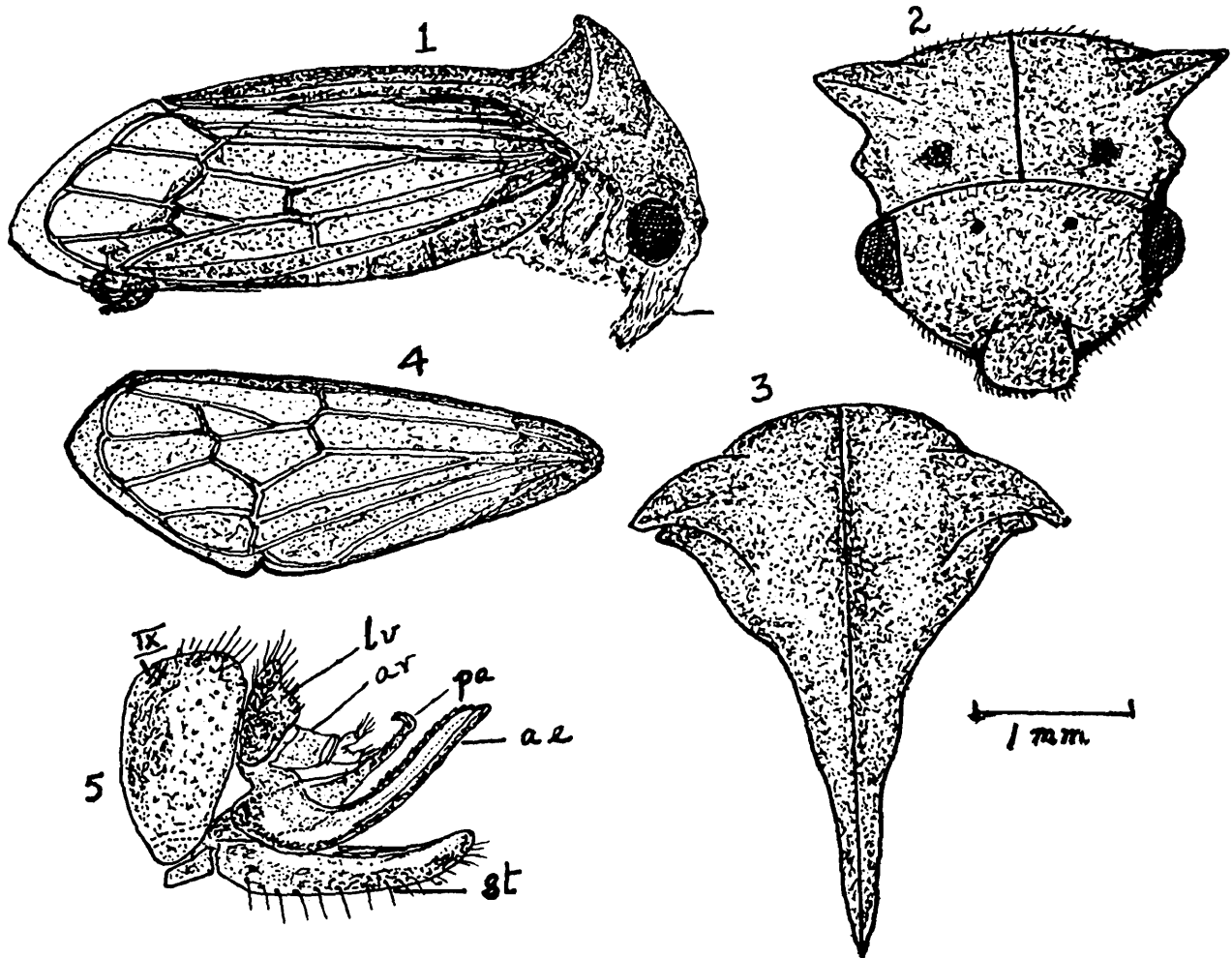
Figs. (1-3) *Tricentrus cinereus* n. sp., ♀

1. Lateral view.
2. Frontal view.
3. Dorsal view of pronotum.



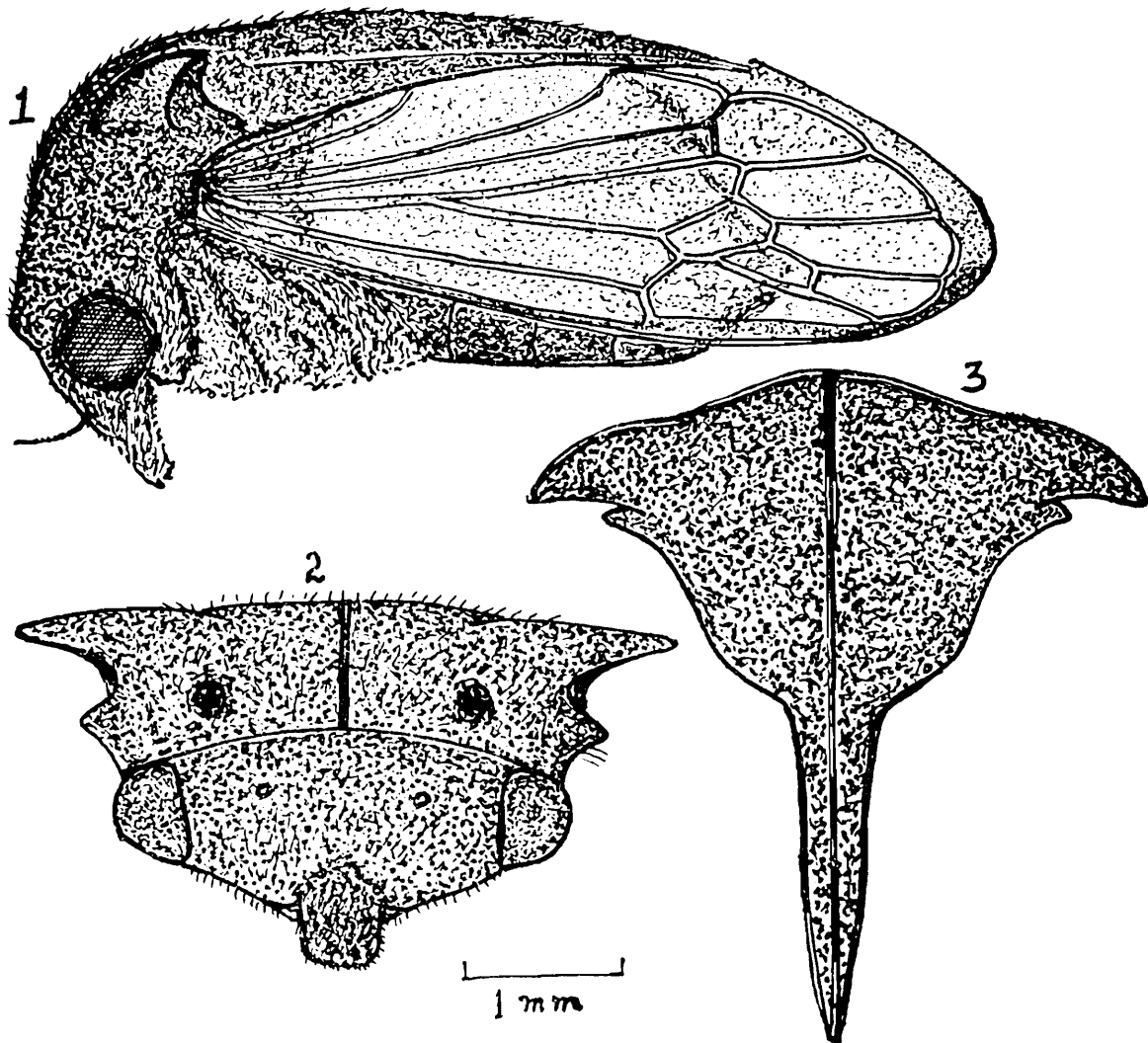
Figs. (1-3) *Tricentrus compressus* n. sp., ♀

1. Lateral view.
2. Frontal view.
3. Dorsal view of pronotum.



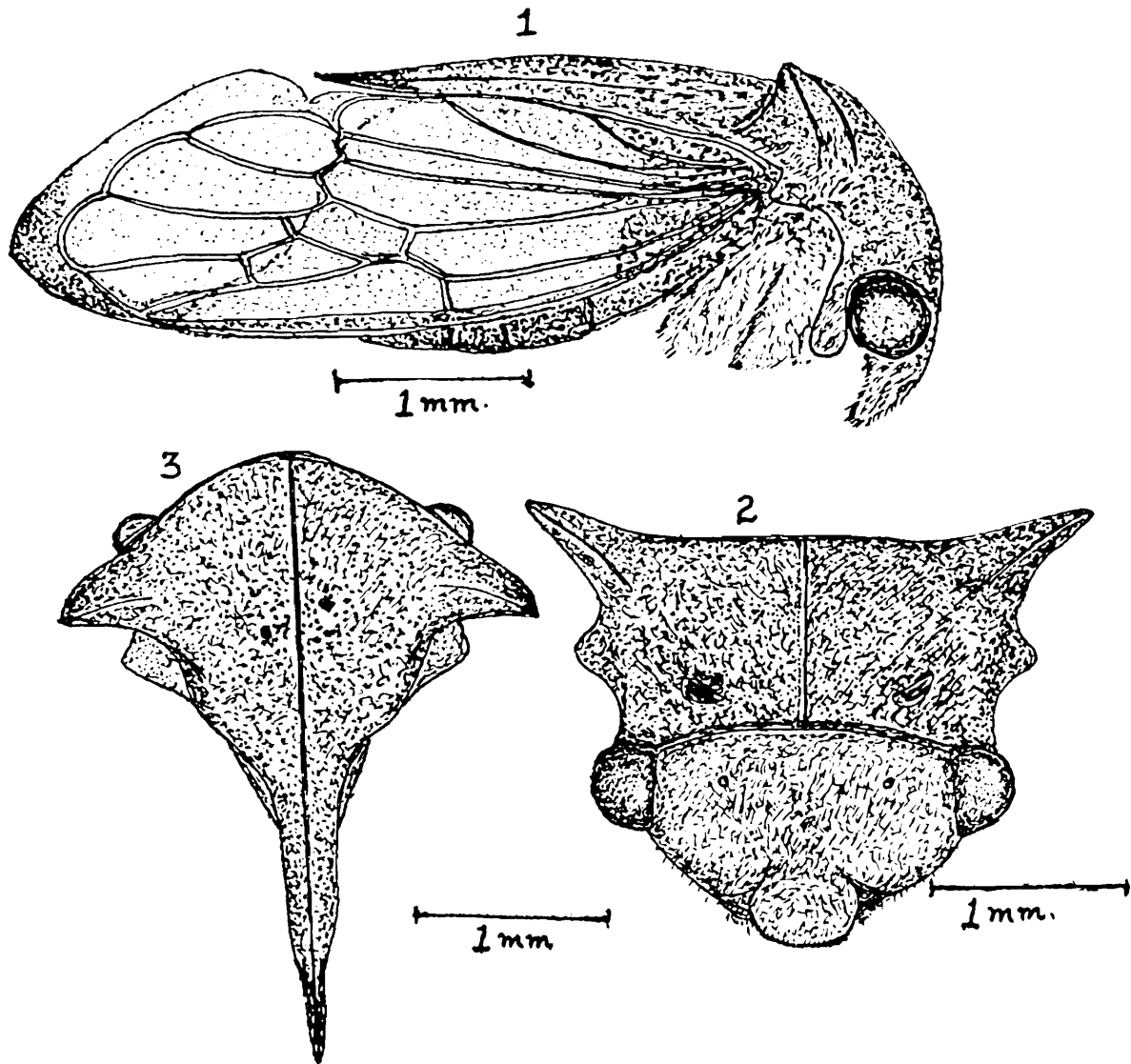
Figs. (1-5) *Tricentrus unicolor* n. sp.

- 1. ♂ Lateral view.
- 2. ♂ Frontal view.
- 3. ♂ Dorsal view of pronotum.
- 4. Tegmina.
- 5. ♂ Genitalia.



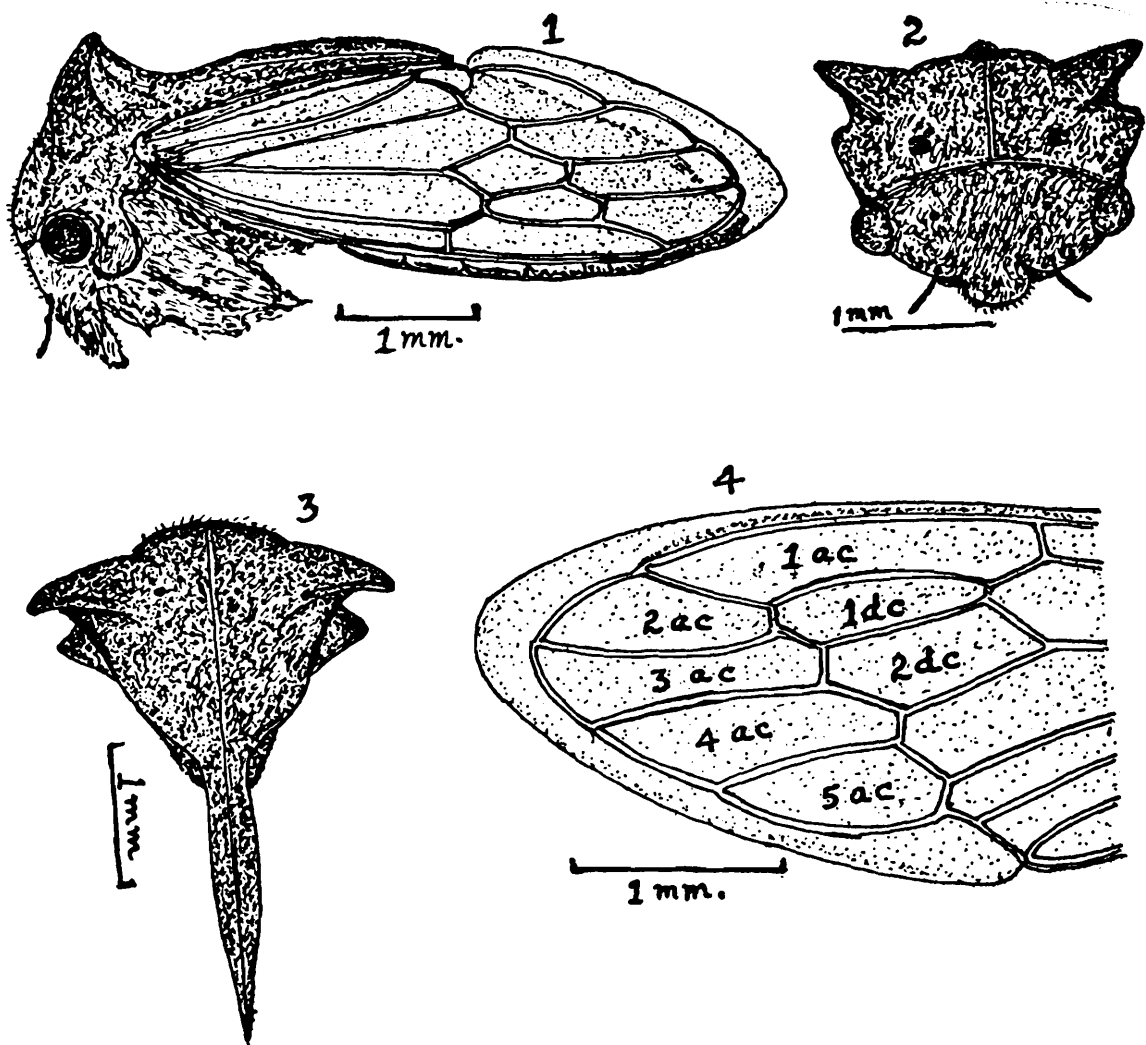
Figs. (1-3) *Tricentrus atrus* n. sp., ♂.

1. Lateral view.
2. Frontal view.
3. Dorsal view of pronotum.



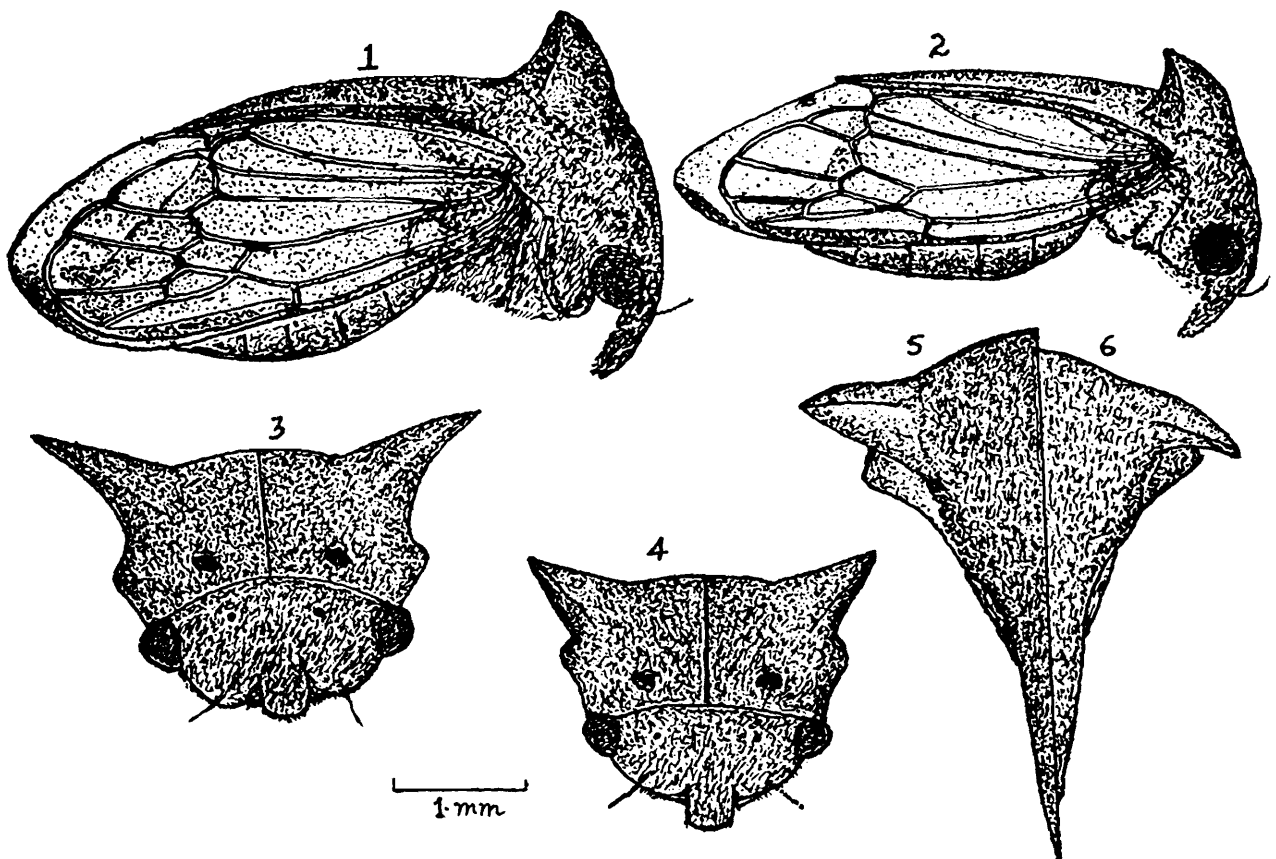
Figs. (1-3) *Tricentrus minusculus* n. sp., ♂ .

1. Lateral view.
2. Frontal view.
3. Dorsal view of pronotum.



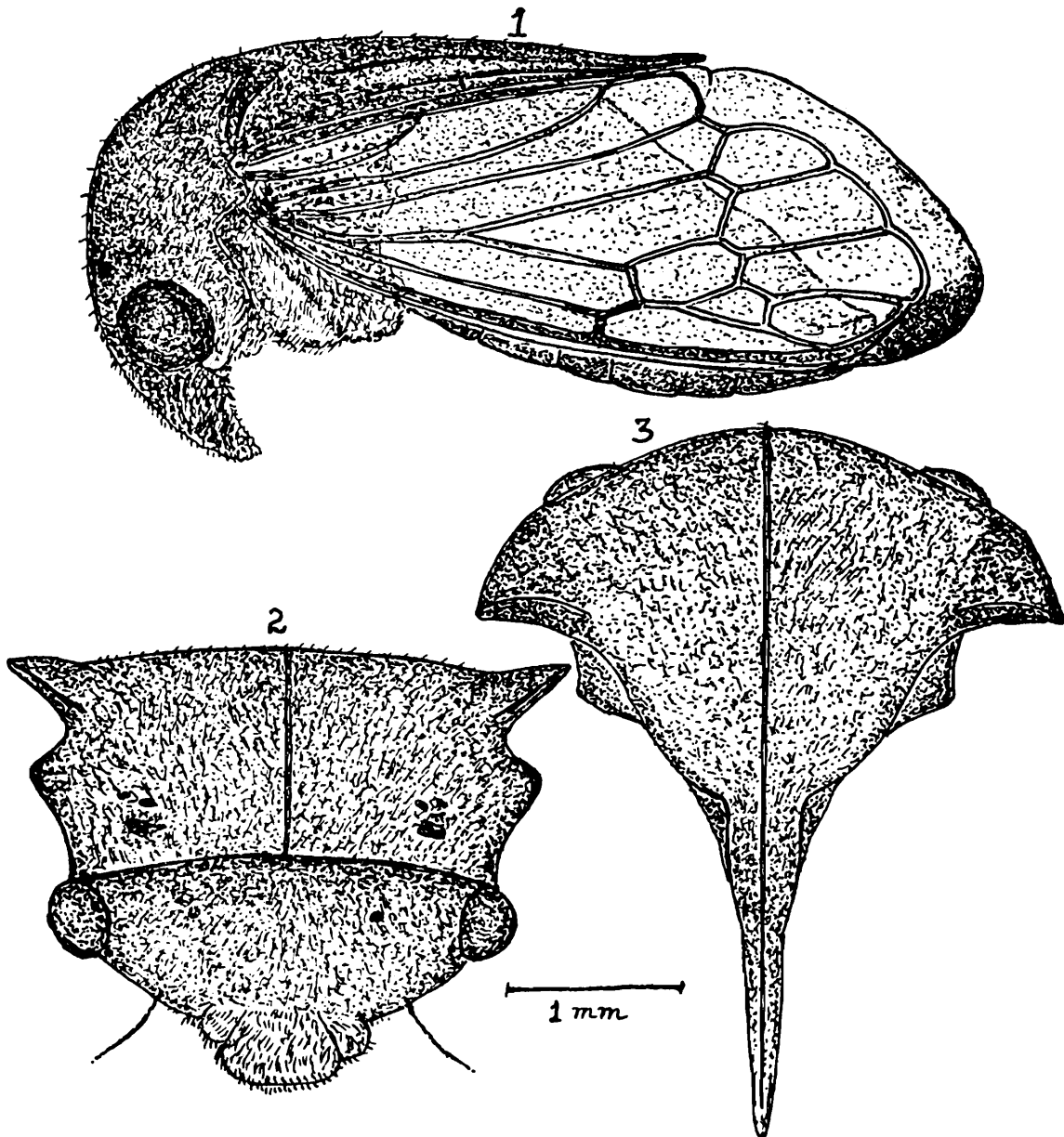
Figs. (1-4) *Tricentrus elegans* n. sp.

1. ♂ Lateral view.
2. ♂ Frontal view.
3. ♂ Dorsal view of pronotum.
4. Tegmina, distal half.



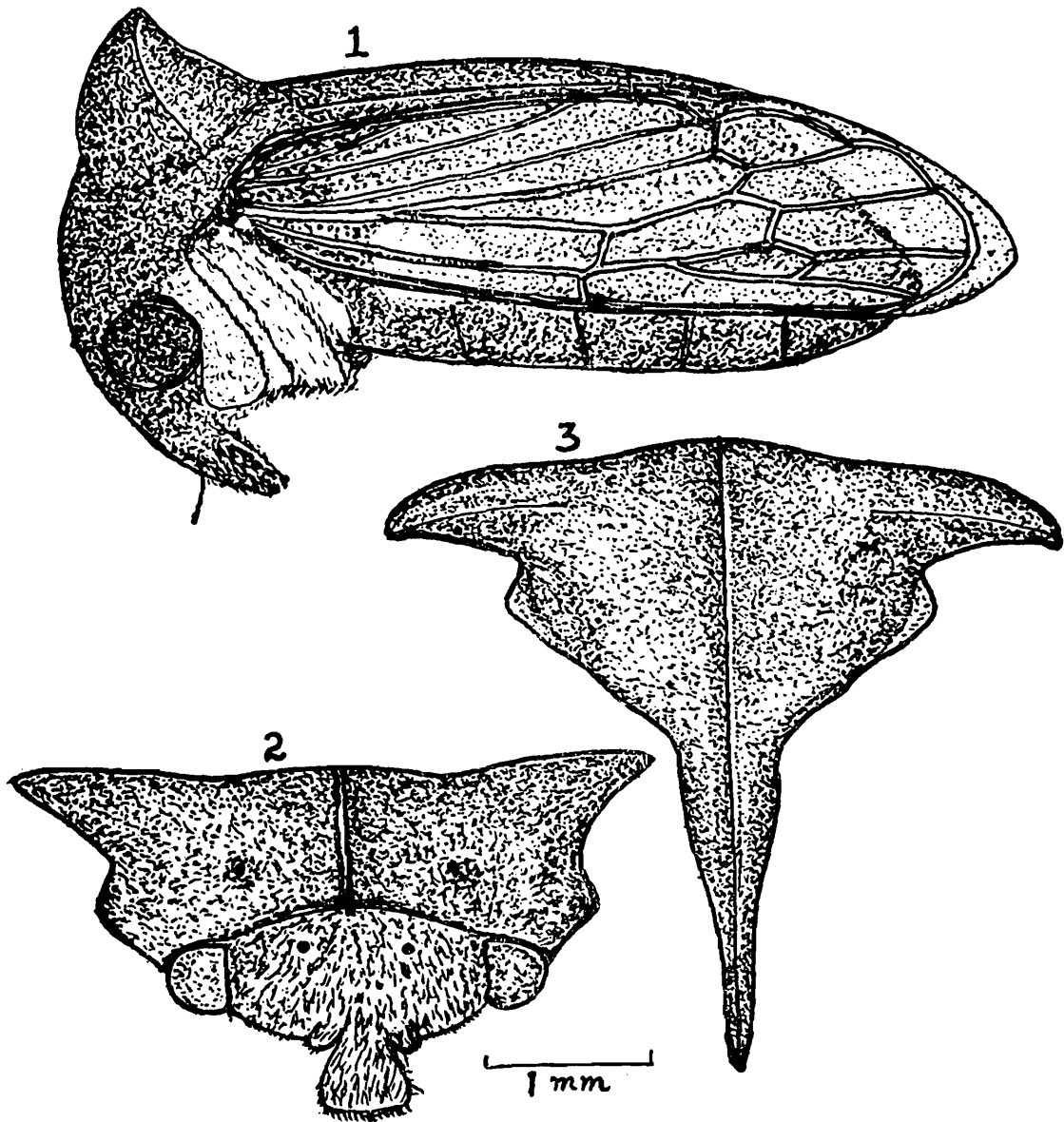
Figs. (1-6) *Tricentrus dubius* n. sp.

1. ♀ Lateral view.
2. ♂ Lateral view.
3. ♀ Frontal view.
4. ♂ Frontal view.
5. ♀ Dorsal view of pronotum, left half.
6. ♂ Dorsal view of pronotum, right half.



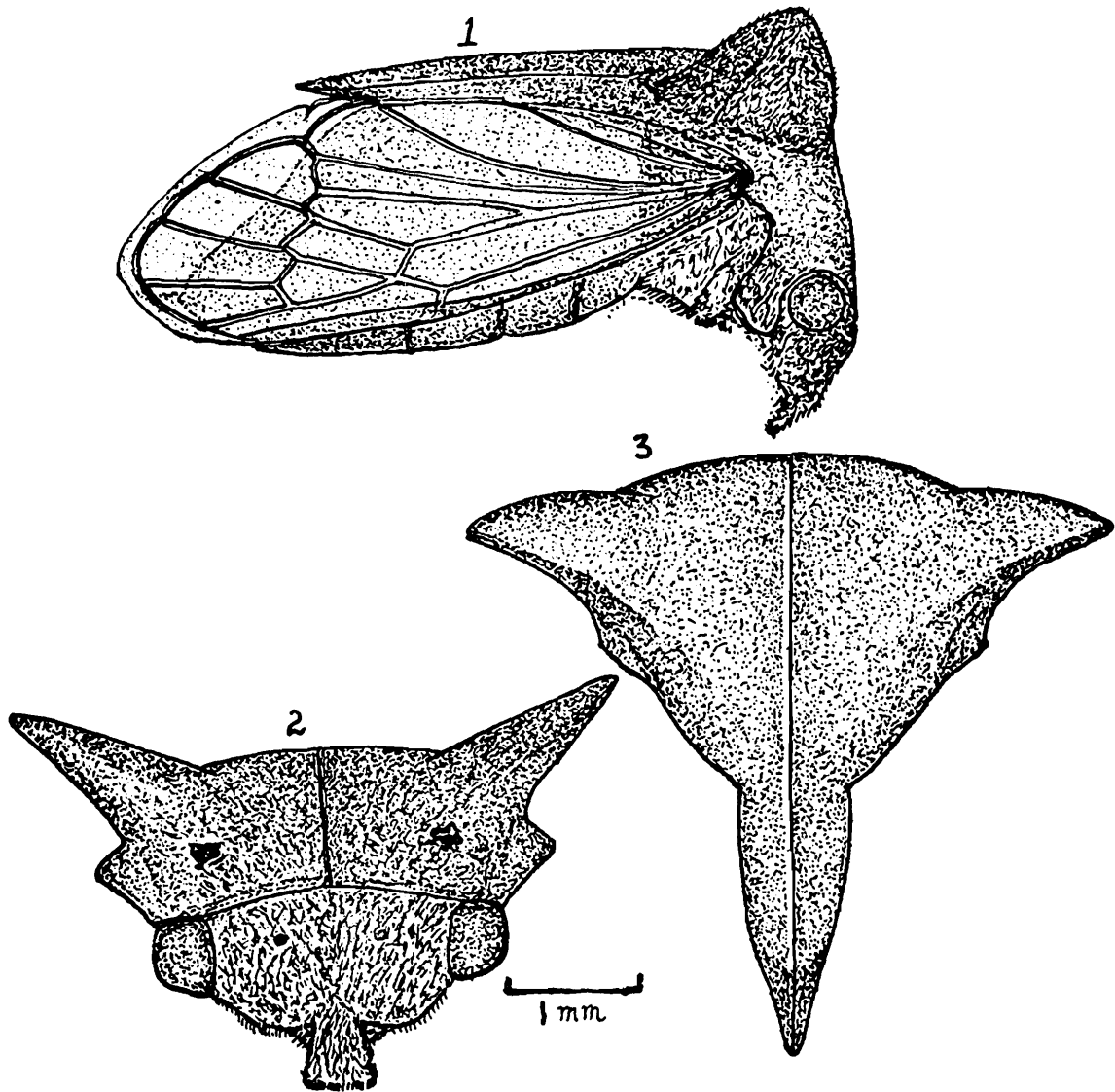
Figs. (1-3) *Tricentrus recurvicornis* n. sp., ♂ .

1. Lateral view.
2. Frontal view.
3. Dorsal view of pronotum.



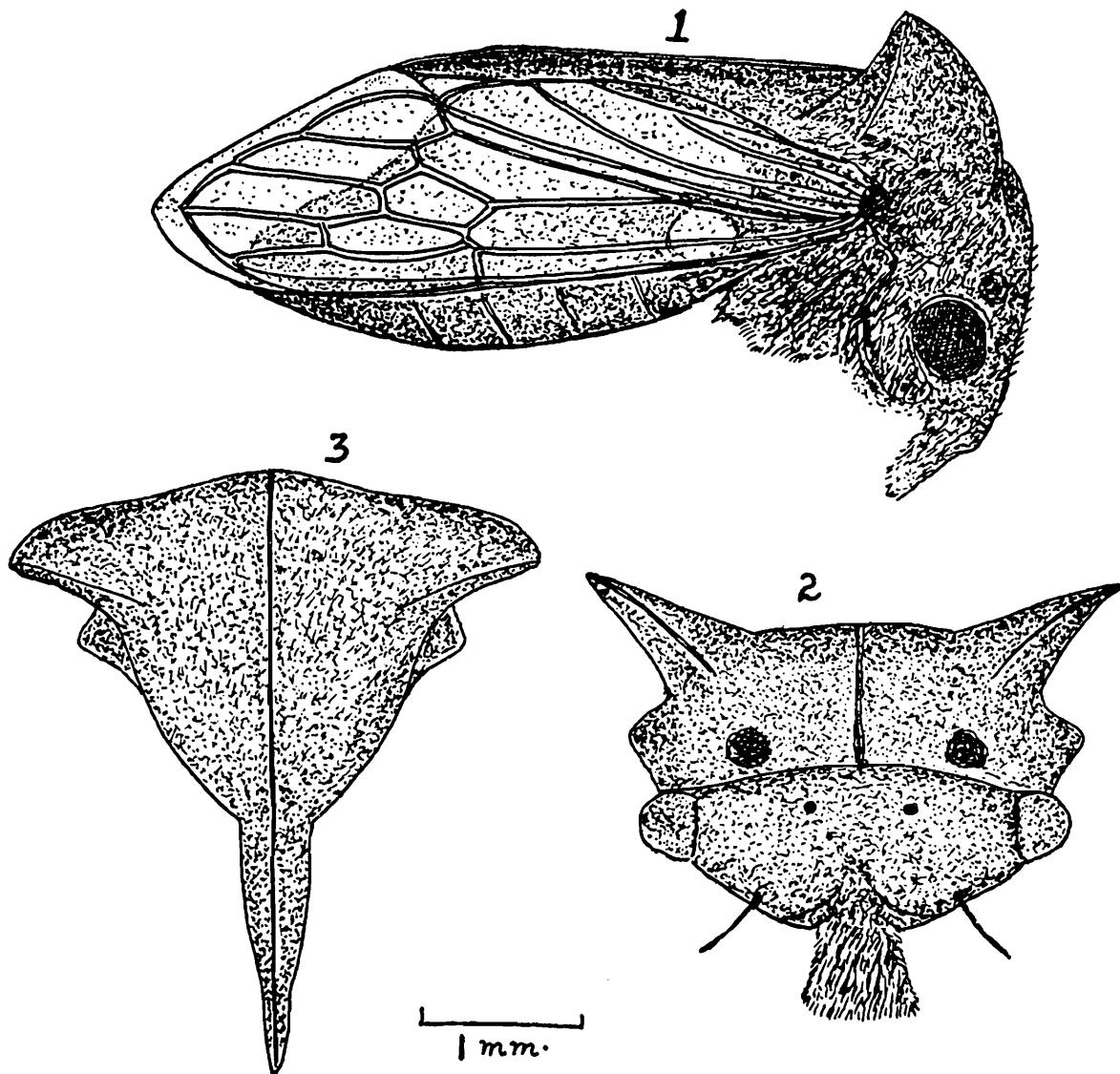
Figs. (1-3) *Tricentrus cornutus* n. sp., ♀

1. Lateral view.
2. Frontal view.
3. Dorsal view of pronotum.



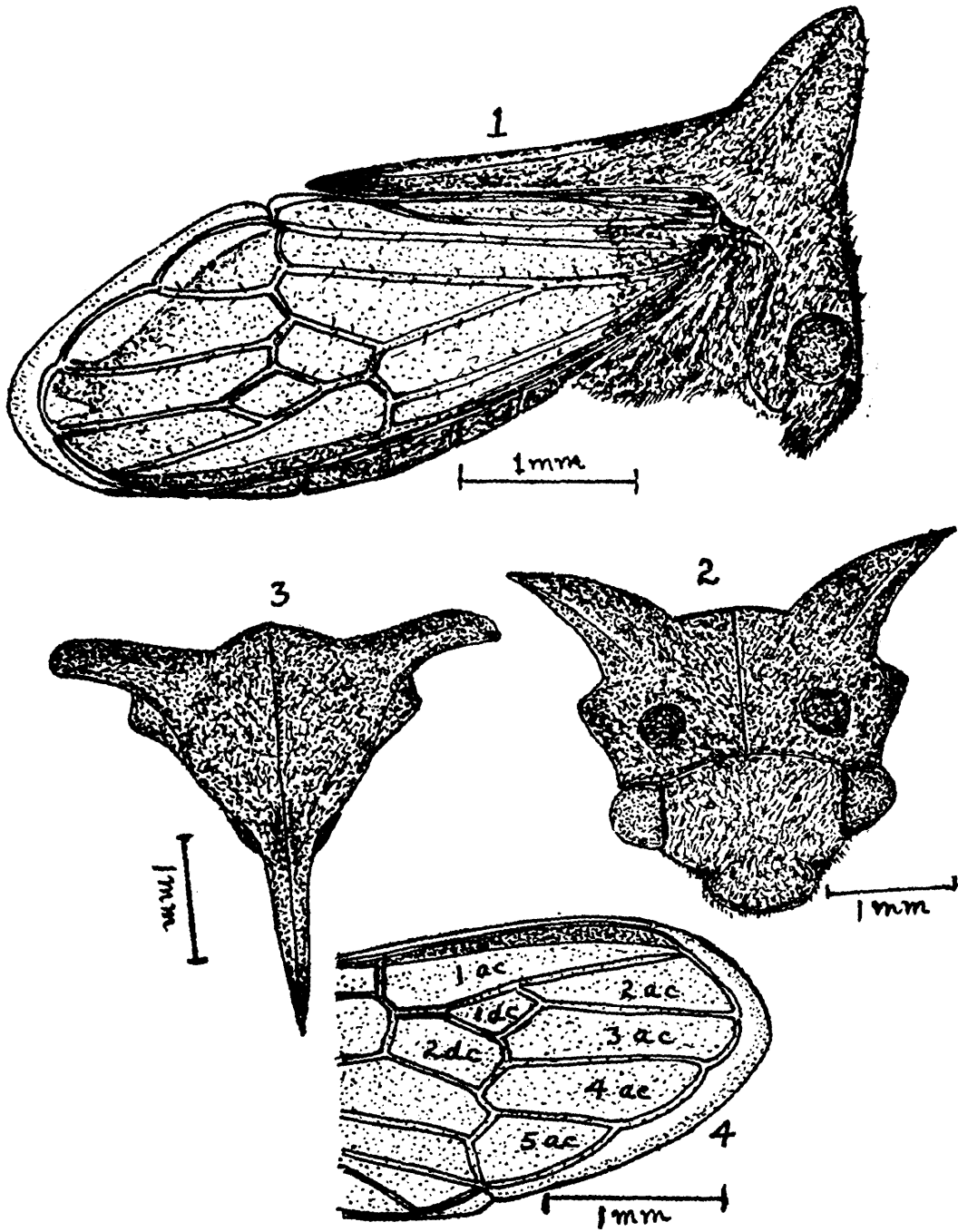
Figs. (1-3) *Tricentrus platycornis* n. sp., ♀

1. Lateral view.
2. Frontal view.
3. Dorsal view of pronotum.



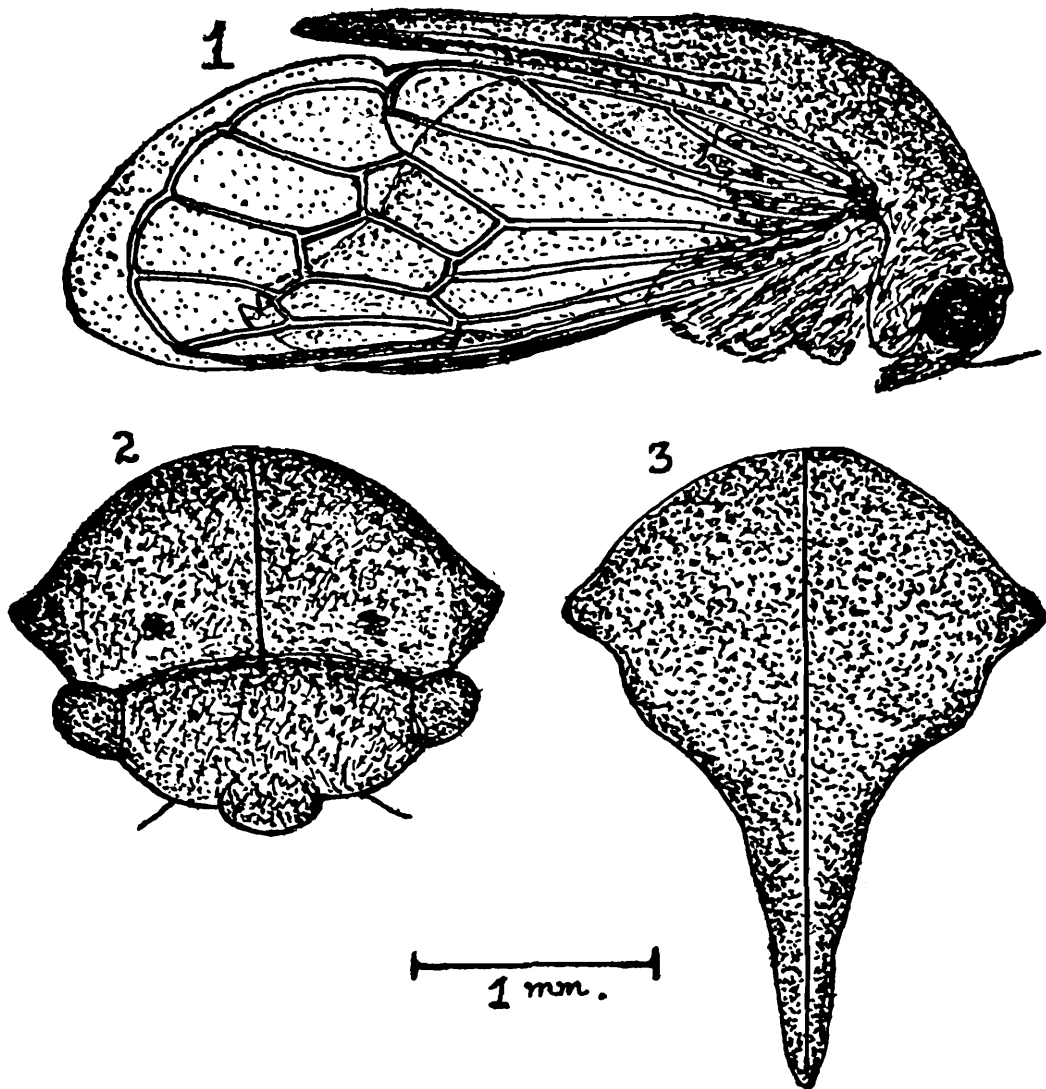
Figs. (1-3) *Tricentrus longiceps* n. sp., ♀ .

1. Lateral view.
2. Frontal view.
3. Dorsal view of pronotum.



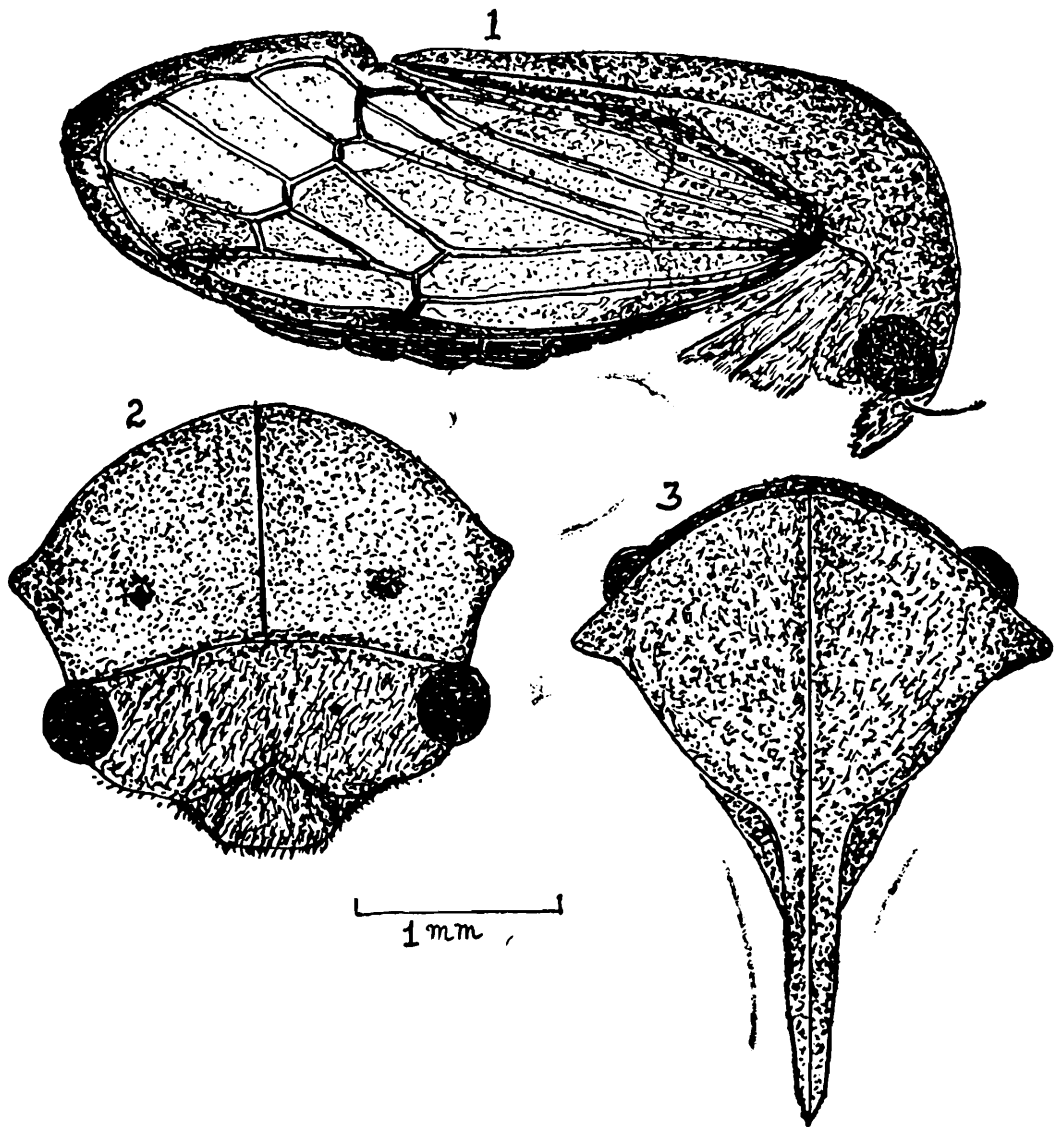
Figs. (1-4) *Tricentrus varicornis* n. sp., ♀ .

1. Lateral view.
2. Frontal view.
3. Dorsal view of pronotum.
4. Tegmina, distal half.



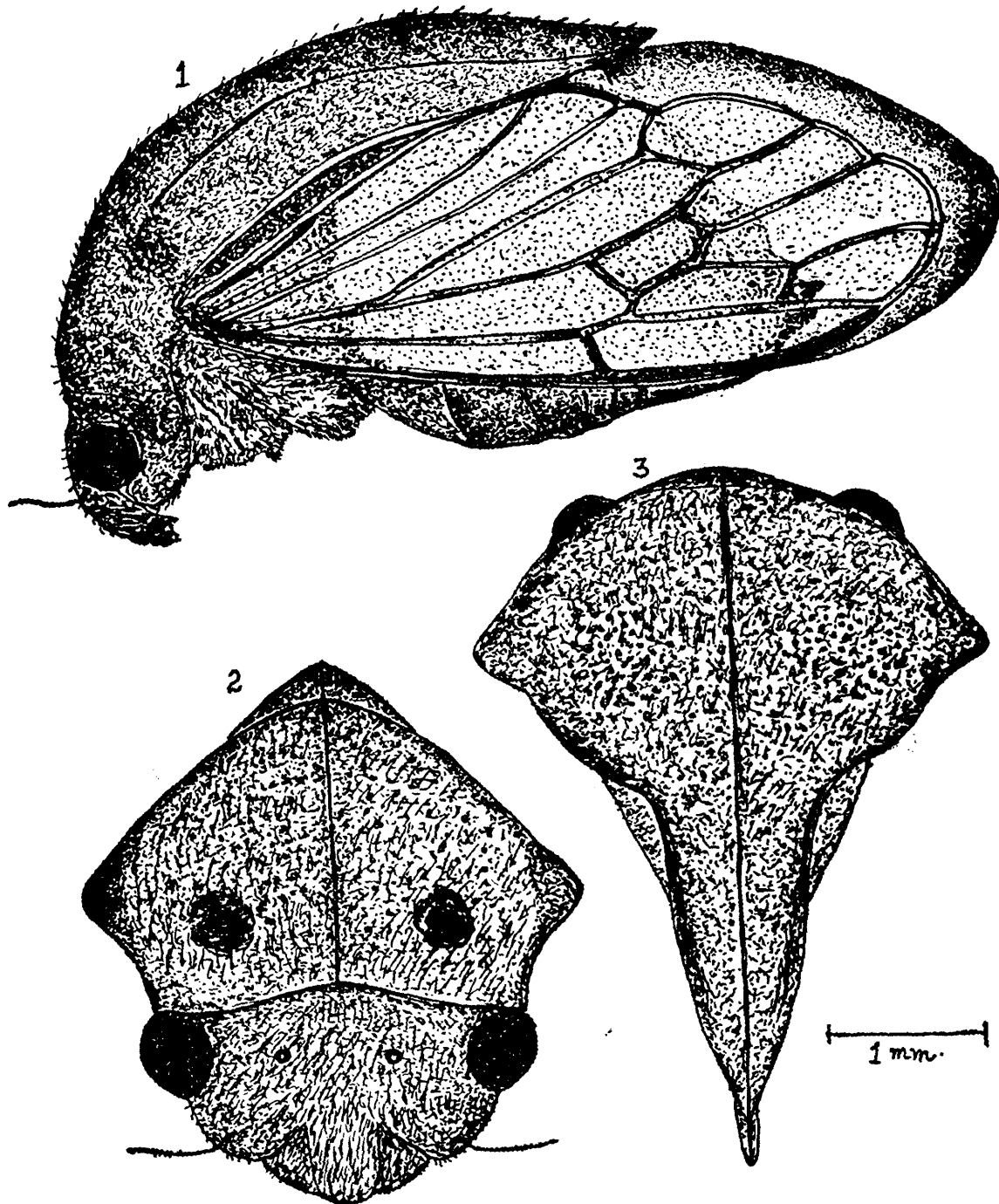
Figs. (1-3) *Gargara discoidalis* n.sp., ♀

1. Lateral view.
2. Frontal view.
3. Dorsal view of pronotum.



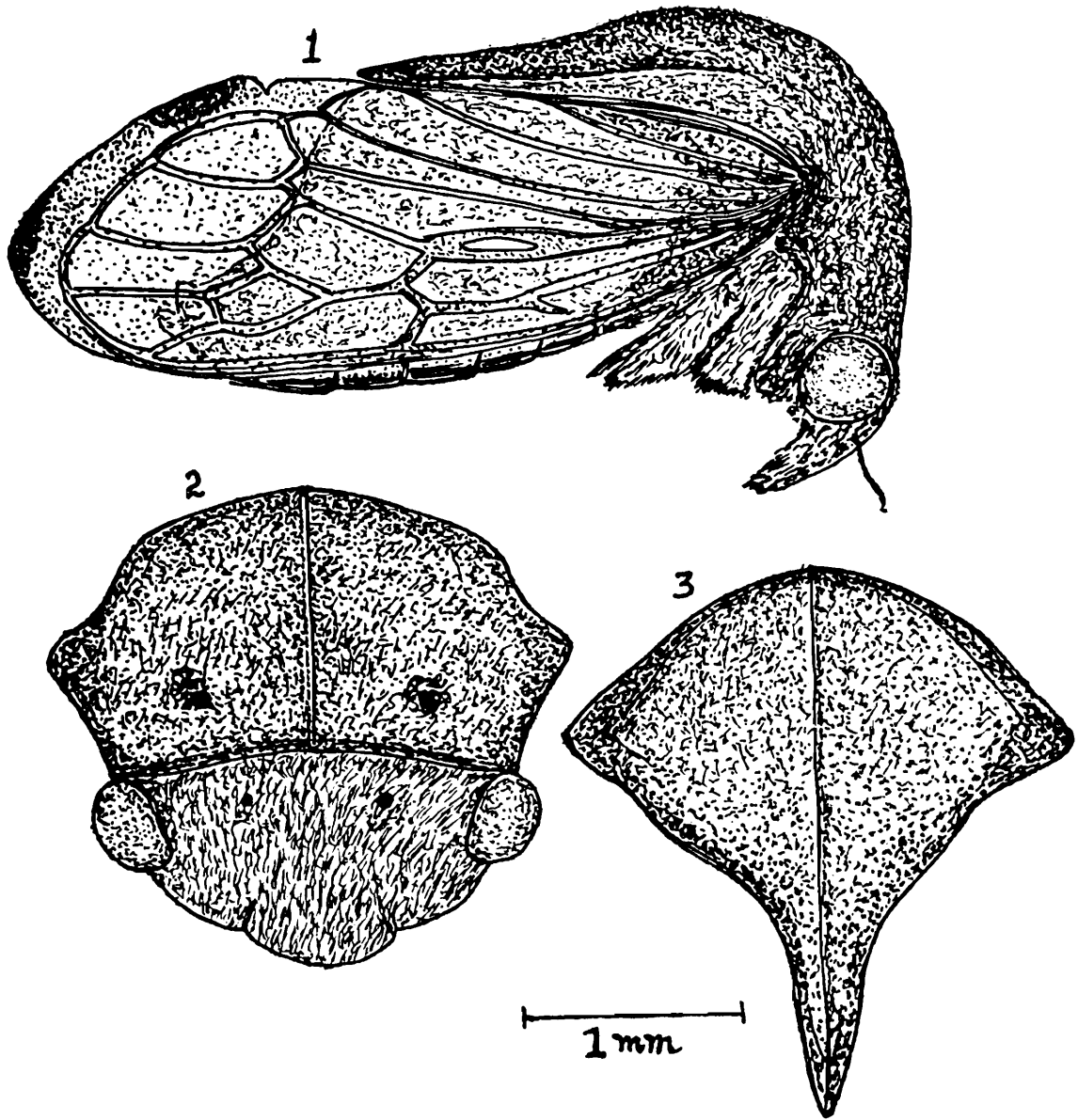
Figs. (1-3) *Gargara nigrolimbata* n. sp., ♂ .

1. Lateral view.
2. Frontal view.
3. Dorsal view of pronotum.



Figs. (1-3) *Gargara brevis* n. sp., ♀

- 1. Lateral view.
- 2. Frontal view.
- 3. Dorsal view of pronotum.



Figs. (1-3) *Gargarina carinata* n. sp., ♂

1. Lateral view.
2. Frontal view.
3. Dorsal view of pronotum.