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The Genus *Epimixia* Kirkaldy (Hemiptera: Tingidae)

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KIRKALDY (1908) created the Genus *Epimixia* to hold *E. alitophrosyne* n.sp., from New South Wales, Australia. In the same publication this author also described another new tingid from Australia as *Teleonemia vulturna*, which was two decades later properly transferred by Hacker (1927) to *Epimixia*.

For more than half a century the Genus *Epimixia* was classified in the Subfamily Agrammatinae Douglas and Scott (*olim* Serenthiinae Stål). In a recent study of the tingid genera of the world, Drake and Ruhoff (1960) transferred *Epimixia* from the agrammatines to the tingines. Then, based upon anatomical studies, Drake and Davis (1960) suppressed the Agrammatinae as inseparable from and a synonym of Tinginae.

The genus *Epimixia* is known only from the Australian Region. The present paper recognizes 5 species and 2 subspecies in the genus. For the loan of types and numerous other specimens, the authors are indebted as follows: Dr. Max Beier, Naturhistorisches Museum, Vienna, Austria; Dr. J. W. Evans, The Australian Museum, Sydney, Australia; Dr. John W. Beardsley, Experiment Station, Hawaiian Sugar Planters' Association, Honolulu, Hawaii; and Dr. E. Kjellander, Naturhistoriska Riksmuseet, Stockholm, Sweden. For the illustrations, we desire to express here our most sincere appreciations to the talented artist Patricia J. Hogue, of Alexandria, Virginia.

Genus EPIMIXIA Kirkaldy

Epimixia Kirkaldy, 1908, Proc. Linn. Soc., New South Wales, vol. 32, p. 790.
Horváth, 1925, Arkiv Zool., vol. 17, p. 15.
Drake and Ruhoff, 1960, Proc. United States Nat. Mus., vol. 112, p. 55.

Head very short, feebly extended in front of eyes, sharply declivent, inserted into prothorax up to hind margin of eyes, armed with occipital and frontal pairs of tubercles or spines, median process or spine, wanting; eyes moderately large; bucculae long, areolate, ends meeting ferous processes short, rounded in front, concave within. Labium extending on to mesosternum; mesosternal laminae of rostral sulcus very wide, areolate, extending forward so that their anterior ends meet with those of buccal laminae between fore coxae; laminae on metamesad in front of labium, prolonged backwards so as to extend between fore coxae; antennisternum less elevated, much more widely separated from each other, entirely open at base; prosternal laminae absent. Antennae long, slender, segment I short, slightly longer and a little

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stouter than II; III very long, slender, two or more times as long as IV; IV slightly swollen, subfusiform.

Pronotum moderately to very strongly gibbose, closely punctate, tricarinate; collum slightly raised, areolate, truncate in front, often feebly narrowly raised and extended backwards between calli so as to form a tiny hood; calli small, impressed, impunctate, each with a deep, transverse, sinuate furrow; paranotum narrow, often ridge-like and without cells opposite humeri, usually a little wider opposite calli, there with or without cells, completely uniseriate in some species. Ostiole and ostiolar canal of metathoracic scent glands present on each metapleuron, sulcus nearly upright with sides elevated. Hypocostal lamina long, uniseriate. Elytra extending considerably beyond apex of abdomen, surfaces of discoidal and sutural areas somewhat flattened, subcostal area rather sharply deflexed, often concealing lateral sides of abdomen; costal area horizontal, composed of one row of tiny to moderately large areolae; discoidal area extending backyards beyond middle of elytron, boundary veins separating discoidal from subcostal and sutural areas varying from scarcely to sharply defined. Metathoracic wings nearly as long as elytra.

Legs moderately long, femora slightly incrassate; tibiae (all legs) slightly bowed (concave beneath), with a moderately large patch of short, closely-set whitish, setal-like hairs at apex of inferior surface. Body beneath usually slightly depressed.

TYPE SPECIES. *Epimixia alitophrosyne* Kirkaldy (Fig. 1, ♂).

This genus can be distinguished at once from all the other genera of the Tinginae by the apical patch of whitish setal-like hairs (Fig. 1a) on the inferior side of all tibiae, the broadly constricted and slightly bent bases of the femora, and the posteriorly prolonged buccal laminae, and the anteriorly produced laminae of metasternum of the rostral channels. In some species with strongly swollen pronotal disc, such as *E. vittata* Horváth and *E. veteris* Drake, the lateral carinae are very low, concolorous with the surface on the pronotal disc, and thus at times they are not very clearly discernible. The areas of the corium are frequently poorly or only feebly differentiated in some species. The brachypterous form and host plants are unknown.

KEY TO SPECIES OF GENUS Epimixia

1.	Pronotum moderately convex; paranota narrow, nearly uniformly expanded, each composed of one row of small areolae; dorsal surface mostly blackish or blackish fuscous with carinae, collar, paranota, costal areas, and boundary veins of corium pale (Fig. 4)	*E. vulturna* (Kirkaldy)
	Pronotum very strongly gibbose; paranota very narrow, usually ridge-like and without areolae adjacent to humeral angles, a little wider and often with tiny areolae opposite calli; dorsal surface largely reddish brown, carinae, collar, paranota, and costal areas pale (Fig. 1)	2
2.	Costal areas fairly wide, each composed of one row of moderately large areolae; lateral carinae clearly visible on pronotal disc (Fig. 1)	3
	Costal areas much narrower, each composed of one row of minute or tiny aerolae; lateral carinae often poorly developed on the disc, concolorous with pronotal surface from middle of disc anteriorly, thus rather difficult to discern	5
3.	Length of fore femur twice transocular width of head (Fig. 1)	*E. alitophrosyne* Kirkaldy
	Length of fore femur not more than one and a-half times transocular width of head	4
4.	Legs entirely black	*E. nigripes* Horváth
	Legs reddish brown, with only tarsi, apices of tibiae, and bases of femora black	*E. nigripes dysmica,* new sub-sp.
5.	Moderately large, not less than 3.30 mm or more in length, legs and antennae entirely black (Fig. 2)	*E. veteris* Drake
	Smaller, not more than 3.00 mm long; legs largely reddish brown, only bases of femora, tips of tibiae, and tarsi blackish	6

6. Length 3.00 mm; pronotum strongly convex; occipital pair of spines appressed, extending forward to front margins of eyes (Fig. 3) .... *E. vittata* Horváth
Smaller, length 2.50 mm; pronotum less gibbose; processes very short, tubercular .... *E. nigriceps* (Signoret)

Epimixia alitophrosyne Kirkaldy (Fig. 1 *a* and *b*)

Epimixia alitophrosyne Kirkaldy, 1908, Proc. Linnean Soc., New South Wales, vol. 32, p. 780.

Large, reddish brown with cephalic tubercles, backward projection of pronotum, paranota and costal areas of elytra pale testaceous; head, calli, body beneath, constricted base of femora, and tarsi black; antennae mostly blackish. Length 4.00–4.50 mm, width (elytra) 1.38 mm.

Head with cephalic tubercles very short; bucculae wide, mostly triseriate. Antenna long, slender, sparsely clothed with short, pale, setal-like pubescence, measurement of segments: I, 0.30 mm; II, 0.21 mm; III, 1.25 mm; IV, 0.55 mm. Legs long, rather slender, finely tuberculate. Anterior femur 1.20 mm long, tibiae 0.75 mm long. Middle legs with femur 1.12 mm long, tibia 0.75 mm long. Hind femur 1.00 mm long, tibia 0.75 mm long.

Pronotum strongly convex, carinae prominent, the lateral pair distinctly convex within in front of middle of pronotal disc; paranotum narrow, cariniform. Elytra with costal area composed of one row of moderately large areolae; subcostal area wide, deflexed almost vertically downward concealing sides of abdomen, mostly seven or eight areolae wide; discoidal area not very clearly defined, extending backwards beyond middle of abdomen.

HOLOTYPE (macropterous male), Sydney, New South Wales, Australia (Fig. 1, *a* and *b*) in the Entomological collection of Experiment Station, Hawaiian Sugar Planters' Association, Honolulu, Hawaii. Another specimen is also at hand from Perth, Western Australia, Australia (Hacker collection). Female unknown.

The very long femora of anterior legs set off this species from all other members of the genus. It is most closely related to *nigripes* Horváth discussed below.

Epimixia nigripes Horváth (new status)

Epimixia alitophrosyne var. *nigripes* Horváth, 1925, Arkiv Zool., vol. 17A, No. 24, p. 16.

Large, reddish brown, with paranota, carinae, and costal areas whitish testaceous; head, calli, and body beneath black; buccal and sternal laminae of rostral sulcus brownish testaceous; legs entirely black; antennae mostly blackish, first two segments dark or blackish brown. Length, 3.65–4.00 mm; width (elytra) 1.10 mm.

Head very short, occipital and frontal tubercles small. Antennae rather sparsely clothed with short, pale, setal hairs, segmental measurements: I, 0.23 mm; II, 0.15 mm; III, 0.81 mm; IV, 0.38 mm. Labium extending almost to base of mesosternum; buccal laminae three areolae deep in widest part, the laminae of mesosternum widest at apex, then tapering posteriorly. Anterior femur 0.75 mm long, the tibia 0.45 mm.

Pronotum strongly convex, tricarinate, the lateral carinae convex wthin in front of middle of pronotal disc; paranota ridge-like opposite humeral angles, then anteriorly broader, whitish, with one row of tiny areolae. Last genital segment of female terminating in a pair of large tubercles (one on each side). Elytra strongly deflexed, covering sides of pronotum; costal area and division of corium practically as in *alitophrosyne*.

HOLOTYPE (male) and ALLOTYPE (female). Evelyne, Queensland, Australia, in Naturhistoriska Riksmuseet, Stockholm.

PARATYPE. One male, same data as type (wrongly labelled "female" by Horváth).

Horváth (1925) described *nigripes* as a new variety of the species wrongly identified and redescribed as *E. alitophrosyne* Kirkaldy. According to the Règles, we are elevating the variety *nigripes* (form with black legs) to specific level and then are giving a new name to the form with reddish brown legs (bases of femora, tips of tibiae, and tarsi black). The bibliography of the two forms are cited under their respective names. The true *E. alitophrosyne* Kirkaldy (Fig. 1, *Holotype*) can be separated at once from *nigripes* and its new variety by the much longer anterior femora (95:60). *E. nigripes* Horváth has entirely black legs; sub-sp. *dysmica* has reddish brown legs with bases of femora (constricted part), tips of tibiae, and tarsi black.

Epimixia nigripes dysmica, new sub-sp.

Epimixia alitophrosyne: Horváth, 1925, Arkiv Zool., vol. 17A, No. 24, p. 16.
Hacker, 1927, Mem. Queensland Mus., vol. 9, p. 20, pl. 10, fig. 16.

This new subspecies is very similar in general aspect to the typical form. It can be separated at once from *nigripes* by the reddish brown legs with tarsi, tips of tibiae, and constricted bases of femora black. In all specimens so far studied, this color difference between the two forms appears to be constant.

HOLOTYPE (male) and ALLOTYPE (female). Colosseum, Queensland, Australia, in Naturhistoriska Riksmuseet, Stockholm.

PARATYPES. One specimen, same data as type and one example, Yerranderle, Colong District, New South Wales, xi. 1927, A. Musgrave. As stated above, the colour of the legs separates this sub-species from the typical form. The anterior femora are the same size as in *nigripes*. Horváth wrongly identified and redescribed *dysmica*, n. sub-sp. as *alitophrosyne*.

Epimixia veteris Drake (Fig. 2)

Epimixia veteris Drake, 1944, Proc. Ent. Soc. Washington, vol. 46, p. 71.

Head black, frontal and occipital pairs of dorsal spines whitish testaceous. Antennae and legs entirely black, body beneath also black. Pronotum reddish brown, shiny, with paranota and posterior process mostly testaceous. Elytra reddish brown, slightly shiny, with costal area pale testaceous, discoidal and sutural areas often with a broad, longitudinal stripe in each. Length, 3.65 mm; width (elytra) 1.10 mm.

Head very short, spines short, appressed, hind pair scarcely reaching to middle of eyes. Antennae long, sparsely clothed with very short, pale pubescence, segmental measurements: I, 0.33 mm; II, 0.15 mm; III, 1.25 mm; IV, 0.40 mm. Bucculae wide, mostly three areolae deep, closed in front, extending backwards between fore coxae. Mesosternal laminae of labial sulcus broad, straight, two areolae deep in front, tapering posteriorly to one row; metasternal laminae much lower than those on metasternum, uniseriate, very widely separated from each other, entirely opened behind. Labium extending beyond middle of mesosternum.

Pronotum strongly convex, tricarinate; lateral carinae feebly raised and slightly convex within in front of middle of disc, with pronotal disc concolorous, thus difficult to see; all of the carinae more elevated on posterior process; paranotum narrow, with minute cells in front of humeri, wider and with slightly larger cells opposite calli. Scent glands with prominent ostiolar sulcus on each metapleuron. Hypocostal laminae uniareolate, the areolae moderately large.

Elytra divided into the usual areas; costal area very narrow, composed of one row of tiny cells; subcostal area fairly wide, sloping almost vertically downwards, four areolae deep in widest part (areolae difficult to count); discoidal area acutely angulate at both ends, extending posteriorly beyond middle of elytra. Legs moderately long, femora slightly swollen. Anterior femur 0.88 mm long, the tibia 0.55 mm.

HOLOTYPE. Male from Samsonville, Queensland, Australia, is figured (Fig. 2). In addition to the paratypes and other specimens from Queensland, we have specimens from South Australia (Adelaide), Western Australia (Yanceps, south of Perth, xi-xii, 1912).

This species is slightly larger than *E. vittata* and *E. nigriceps* but is easily separated from them by the entirely black appendages.

Epimixia vittata Horváth (Fig. 3)

Epimixia vittata Horváth, 1925, Arkiv Zool., vol. 17A, No. 24, p. 16.

Small. Head black, with dorsal spines whitish; bucculae testaceous; antennae blackish. Legs reddish brown, tarsi and tips of tibiae black. Body beneath black, laminae of rostral channel whitish testaceous. Pronotum reddish brown, collar, paranota, and posterior process of pronotum somewhat testaceous. Elytra brownish testaceous, inner part of discoidal area and a median longitudinal stripe in sutural area fuscous. Length, 3.25–3.40 mm, width (elytra) 0.95 mm.

Head very short, occipital spines fairly long, appressed, reaching forward to front margins of eyes; frontal pair of processes small, tubercular, widely separated from each other. Bucculae wide, four areolae deep at base, tapering anteriorly to three cells. Antennal measurements: segment I, 0.25 mm; II, 0.15 mm; III, 0.90 mm; IV, missing.

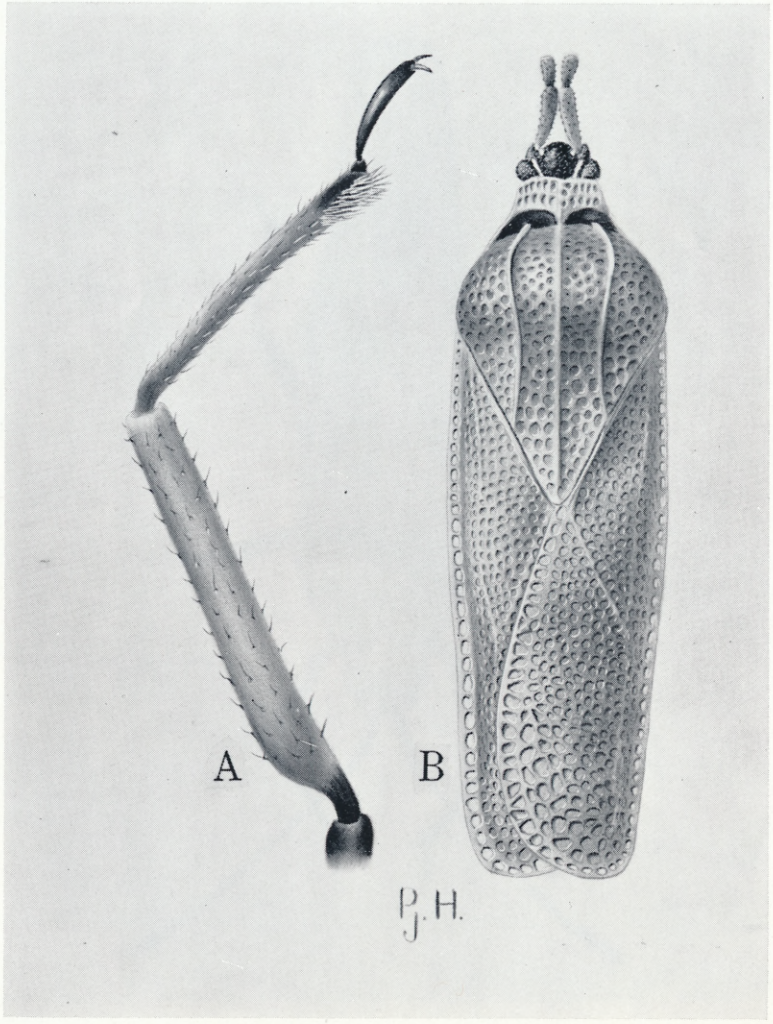

FIG. 1.—*Epimixia alitophrosyne* Kirkaldy; (a) fore femur; (b) dorsal aspect of ♂ type.

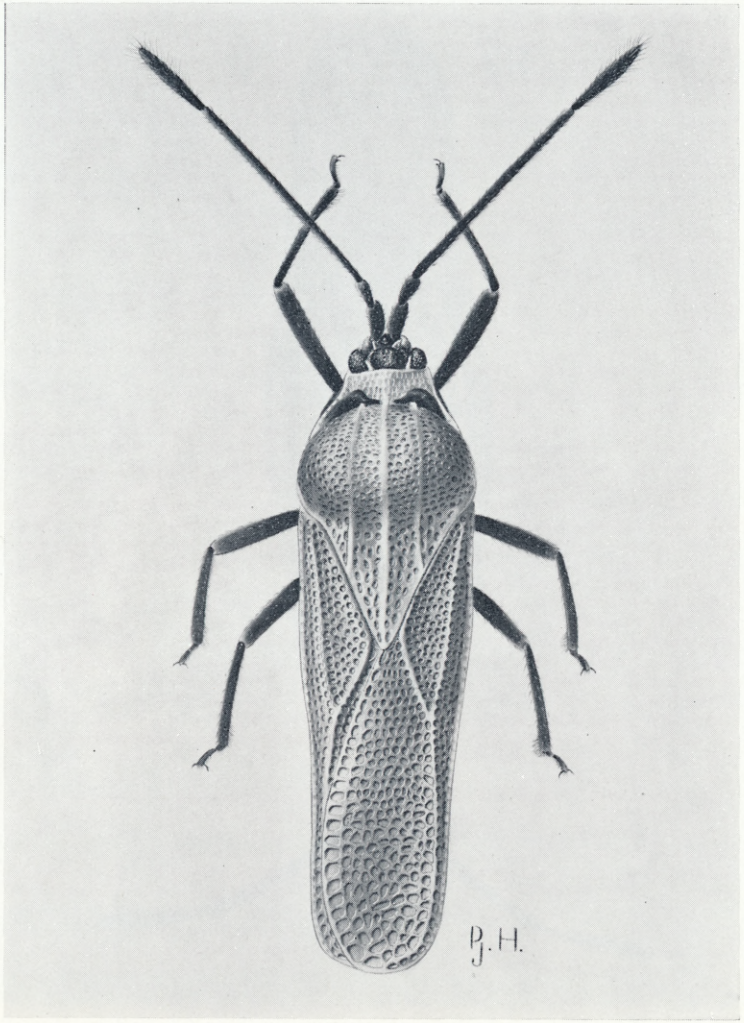

FIG. 2.—*Epimixia veternis* Drake.

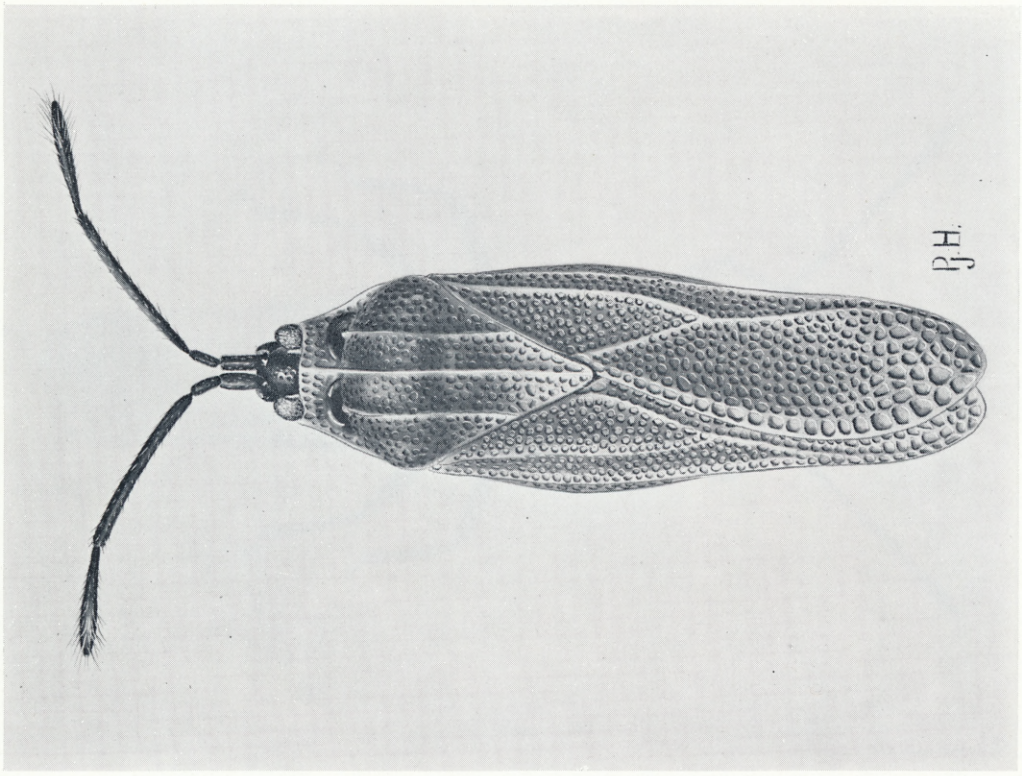

FIG. 4.—*Epimixia vulturna* (Kirkaldy).

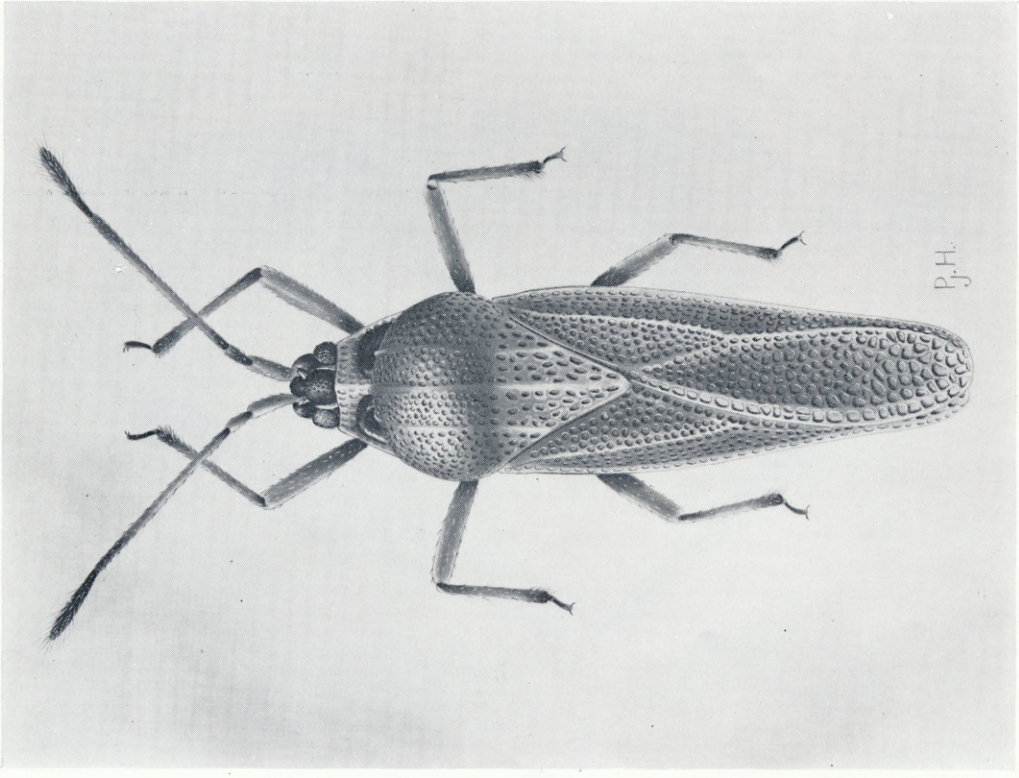

FIG 3.—*Epimixia vittata* Horváth.

Pronotum strongly convex, closely punctate, tricarinate; carinae very low and scarcely discernible on pronotal disc, lateral pair there slightly convex within, the carinae more elevated and parallel on posterior pronotal process; paranota very narrow, cariniform with areolae scarcely distinct opposite humeri, slightly wider and composed of a row of small cells opposite calli. Metathoracic scent glands with ostiole and ostiolar canal on each metapleuron, the sulcus with raised sides, upright, slightly tilted backward.

Elytra divided into the usual areas; costal area very narrow, composed of one row of tiny cells; subcostal area nearly upright, three to four areolae deep; discoidal area acutely angulate at base and apex, six areolae deep in widest part. Hypocostal laminae long, uniareolate. Legs rather short, femora slightly incrassate. Length of fore femur 0.68 mm, the tibia 0.40 mm.

HOLOTYPE (female). Colosseum, Queensland, Australia, in Naturhistoriska Riksmuseet, Stockholm, Sweden. We have specimens from Queensland (Samsonvale, 28/4/1928) and New South Wales (Hawksburg District, 27/8/1956). The characters employed in the key separate this species from its congeners. A specimen from Samsonvale is illustrated.

Epimixia nigriceps (Signoret)

Agramma nigriceps Signoret, 1881, Bull. Séances. Ann. Soc. Ent. France. ser. 6. vol. 1. p. L.

Serenthia nigriceps: Lethierry and Severin, 1896, Cat. Gén. Hém. Hét., vol. 3, p. 5.

Epimixia nigriceps: Drake and Ruhoff, 1960, Proc. U.S. Nat. Mus., Vol. 112, p. 55.

Small, reddish brown, sides of pronotum beyond lateral carinae blackish, discoidal area and inner part of sutural areas fuscous, the collar, costal areas, paranota, and boundary veins of discoidal areas pale testaceous; legs reddish brown with tips of tibiae and tarsi blackish; antennae reddish brown, first two and most of fourth segment black. Body beneath black, with sternal laminae of rostral sulcus whitish testaceous. Length, 2.60 mm, width (elytra) 0.75 mm.

Head with occipital and frontal pairs of small, pale tubercles; bucculae wide, triareolate in widest part, closest in front. Labium extending a little beyond middle of mesosternum; laminae of rostral sulcus on metasternum wide, tapering posteriorly; laminae on metasternal sulcus low, uniseriate, nearly straight, widely separated from each other, entirely open behind. Antennae long, slender, sparsely beset with pale, setal hairs, measurements of segments: I, 0.30 mm; II, 0.25 mm; III, 0.78 mm; IV, 0.30 mm. Orifice and canal of metathoracic scent glands present on each metapleuron, the small channel distinct, upright, with sides elevated.

Pronotum strongly convex, tricarinate, closely punctate; lateral carinae slightly concave within in front of middle of pronotal disc; paranota very narrow, without areolae opposite humeri, wider and areolate opposite calli. Elytra scarcely as wide as pronotum across humeri; costal area very narrow, with one row of tiny areolae; subcostal area nearly vertical, mostly triseriate; discoidal area acutely angulate at base and apex, five areolae deep near the middle. Metathoracic wings slightly shorter than elytra. Legs rather short, with femora slightly incrassate and indistinctly granulate. Anterior femora with row of short setal hairs on inferior face, 0.55 mm long, the tibia 0.35 mm long.

HOLOTYPE. New Caledonia, in Naturhistorisches Museum, Vienna, Austria. Not recorded from elsewhere.

E. nigriceps is the smallest member of the genus. It can be separated from *vittata* Horváth by its smaller size, less globose pronotal disc, less elevated and slightly more prominent lateral carinae. The paranota is also narrower opposite the humeral angles. Since *nigriceps* possesses all of the generic structures, it was transferred to this genus.

Epimixia vulturna (Kirkcaldy) (Fig. 4)

Teleonemia vulturna Kirkaldy, 1908, Proc. Linnean Soc., New South Wales, vol. 32, No. 4, p. 781.

Hacker, 1927, Mem. Queensland Mus., vol. 9, No. 1, p. 22.

Epimixia vulturna: Drake, 1944, Proc. Ent. Soc. Washington, vol. 46, No. 3, p. 67.

Epimixia tenuatis Drake, 1944, Proc. Ent. Soc. Washington, vol. 46, No. 3, p. 71. (New synonymy.)

Epimixia evansi Drake, 1944, Proc. Ent. Soc. Washington, vol. 46, No. 3, p. 72. (New synonymy.)

Color rather variable, blackish or blackish fuscous, with paranota, collar, pronotal carinae, costal and most of discoidal and sutural areas pale, testaceous to stramineous, smooth, slightly

shiny, head, body beneath and appendages black, somewhat shiny. Length, 2.90–3.35 mm, width (elytra) 0.90–1.00 mm.

Head very short, cephalic spines short, appressed. Antennae long, slender, sparsely furnished with short, pale, setal hairs, segmental measurements: I, 0.18 mm; II, 0.13 mm; III, 0.80 mm; IV, 0.38 mm. Bucculae wide, areolate, closed in front, posteriorly extending backwards between fore coxae. Labium brown, reaching to base of mesosternum; mesosternal laminae of rostral sulcus wide, biseriate in front, tapering posteriorly, to uniseriate; metasternal lamina much more widely separated from each other, composed of one row of small areolae. Metathoracic scent gland with ostiole and ostiolar channel on each metapleuron, the sulcus with sides raised, nearly upright, slightly arculately tilted backwards. Hypocostal laminae uniseriate.

Pronotum moderately convex, closely punctate, tricarinate, all carinae raised, plainly visible and more elevated on posterior process of pronotum; collum raised, with two rows of encircling areolae, slightly produced backwards under median carinae so as to form a tiny hood; paranota narrow, long, composed of one row of small areolae, areolae slightly wider opposite calli. Elytra much longer than abdomen, not wider than width of pronotum across humeri, divided into the usual areas; costal area very narrow, composed of one row of tiny areolae; subcostal area mostly triseriate, nearly upright, five areolae deep in widest part. Hind wings longer than abdomen, smoky brown.

HOLOTYPE. Macropterous female, Kuranda, Queensland, Australia, in Hawaiian Sugar Planters' Association, Honolulu, Hawaii.

Other specimens, males and females, are at hand from Queensland (Samsonvale, North Pines, Cairns District, and National Park), New South Wales (Hawkesburg, and Canterbury), South Australia (Adelaide) and Tasmania. The males tend to be slightly smaller than the females, and they vary about as much in coloration.

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