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NOTES ON DISTRIBUTION AND DESCRIPTIONS OF NEW SPECIES.

(Orders: Odonata, Plecoptera, Orthoptera, Trichoptera and Coleoptera).

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Contents.

Summary.

The range of distribution is greatly increased in two dragonfly species, one of them, *Austropetalia patricia* being recorded for the first time from Victoria. Larva of *Thaumatoperla alpina* is described, figured and compared with larva of *Th. flaveola,* described previously. A new species of *Cylindracheta* is described from Queensland, thus extending the range of the genus to that State. *Archaeophylax canarus* is but the second species of the family Limnephilidae to be recorded from Australia. Two new species of Tenebrionid beetles are described; one of which, *Tribolium apiculum* was discovered in a nest of a native bee, and is but the fourth indigenous species of that well known cosmopolitan genus. Larva of a common click-beetle *Hapatesus hirtus,* which has caused considerable damage to potato crops in Victoria, is described.

Order ODONATA.

(Fig. 1).

Interesting data on distribution of two dragonfly species have been accumulated during the past few years, and extends the known range considerably. One of them, *Austropetalia patricia (Till)*, is recorded in Victoria for the first time.

Family HEMIPHLEBIIDAE.

Hemiphebia mirabilis Selys (1877).

Specimens of this rare and interesting species have been collected and recorded in literature only occasionally. The distribution was believed to be restricted to one known locality —the Goulburn River near Alexandra, Victoria. Though the locality for the type specimen was given as Port Denison, Queensland, it is certain that the type has been mislabelled. In the Victorian locality specimens are found flying between reeds in calm backwater pools which occasionally, in flood time, are connected with the nearby river; the type locality has dry tropical conditions with coastal mangrove swamps and with no fresh water in the area for long periods. Frazer (1957, p. 51) in his "Reclassification of the order Odonata" refers to the Victorian locality only: "*H. mirabilis* Selys, confined, so far as is at present known, to a single habitat on the Goulburn River, near Alexandra, Victoria, Australia." Tillyard visited this locality on 22nd and 23rd December, 1906, and again on 6th and 7th November, 1927. During this second visit Tillyard and his colleagues collected larvae of *H. mirabilis*.

Since Tillyard's last visit no more captures have been recorded in literature. In November, 1954 Mr. R. Dobson, a well-known dragonfly collector from New South Wales (now of Jersey Isl.) asked the entomological staff of the National Museum of Victoria to join in the search for the exact locality described by Tillyard (1928). With three or four of Tillyard's photographs of the locality in hand, Mr. Dobson, accompanied by Mr. Burns and the author, searched the country along the Goulburn River near Alexandra on 6th December, 1954. It was expected that the backwater pools would have changed considerably during the 27 years since Tillyard's visit, but it was a great surprise that after a day's search, in the late afternoon the locality was located almost unchanged; even an old dead gumtree in the distance was still standing, and with only one of its dry limbs lost! It took only five more minutes to capture the first specimen.

Some time later, while arranging specimens collected by the author earlier that year, the species was recognized from another locality—Tarrawarra, near Healesville, Victoria (2♀ 5th January, 1954). To ascertain the presence of *H. mirabilis* in this locality, another visit was made on 15th December, 1958 when again more specimens were collected and others seen resting on reeds. Further specimens were collected at this locality by

Dr. B. P. Moore on 2nd February, 1959. This new locality is situated on Yarra River flats which are subject to flooding each year and which retain their swampy nature for some months. Towards the end of summer the area dries out, the only water remaining being in the nearby river.

Another two specimens of *H. mirabilis* were found amongst the late Mr. Renton's material, now in the National Museum. Both specimens are labelled " Seville, Victoria, 26th December, 1917." This locality is situated some miles upstream from Tarrawarra, but has similar characteristics.

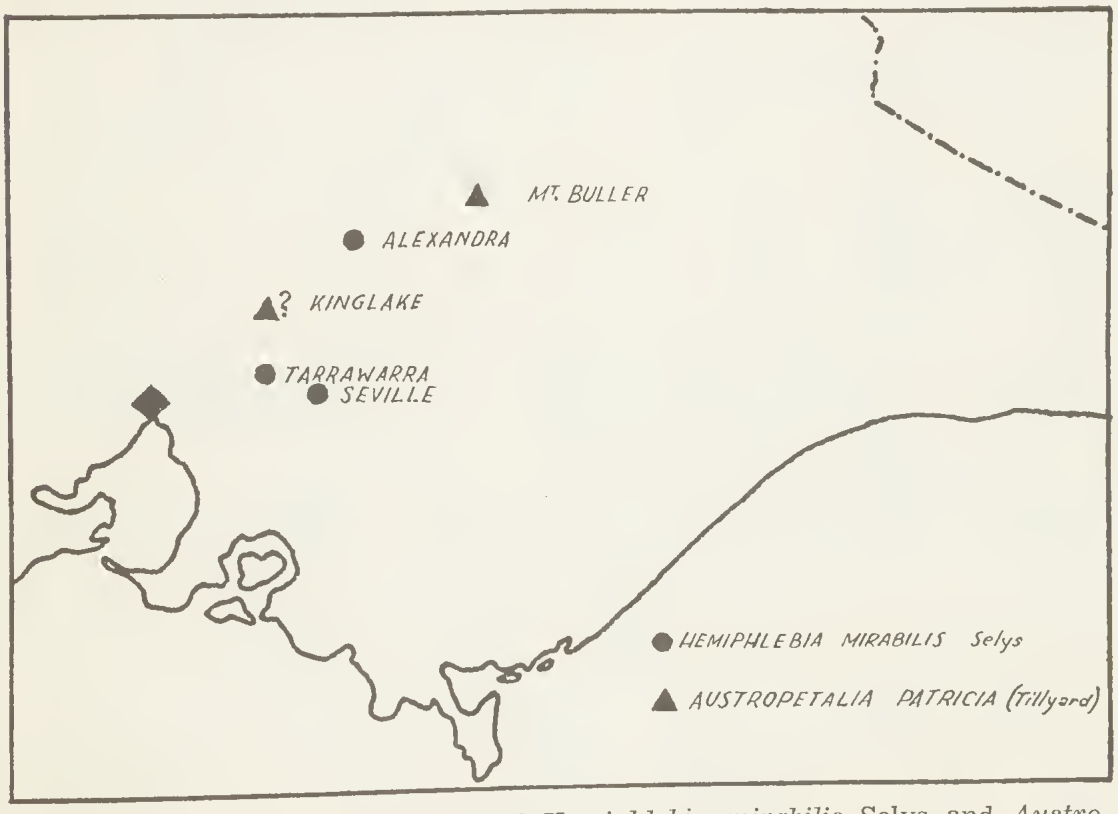

Fig. 1. Map showing distribution of *Hemiphlebia mirabilis* Selys and *Austropetalia patricia* (Tillyard) in Victoria.

Summarizing the above discussion, we can be quite certain that the type specimen has been mislabelled, and that it has never been collected at Bowen, Queensland. The species is not as rare as believed, but it does require certain conditions for its domain. All three Victorian localities, where *H. mirabilis* has been collected, although separated by the Great Dividing Range, are located on wide river flats, subject to periodic flooding and possessing, at least for part of the year, large or small backwater pools with a rich and varied vegetation.

Family AESHNIDAE.

Austropetalia patricia (Tillyard), (1909).

This species was previously known from several localities in New South Wales but had not been recorded further south. The first but rather uncertain indication of its occurrence in Victoria was a specimen found by the author caught in a car radiator grille. Prior to the discovery, the car had been used solely around suburban Melbourne with an exception of a single day's outing in the Kinglake–Toolangi district about 45 miles N.E. of Melbourne. It seems likely therefore, that the species would occur somewhere in that area, and the time was limited to a period of about 3 weeks in late October or early November, 1954. That particular specimen, a female, was in reasonably good condition and is now in the National Museum collection.

Some years later two specimens were brought to the National Museum for identification from the Mt. Buller area in Central Victoria. These two specimens, ♀, 6th November, 1957, and ♂, 20th November, 1957, were collected by Mr. I. F. Edwards along a rapid flowing stream near Timbertop School property at the foot of Mt. Buller; they are now in the National Museum collection. Other specimens in the Geelong Grammar School Timbertop collection, were collected at the early part of November of the two successive years 1957 and 1958.

The species is obviously breeding in the area and thus extends the known area of distribution for several hundred miles south. It is also the first record of the species from Victoria.

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Order PLECOPTERA.

Family EUSTHENIDAE.

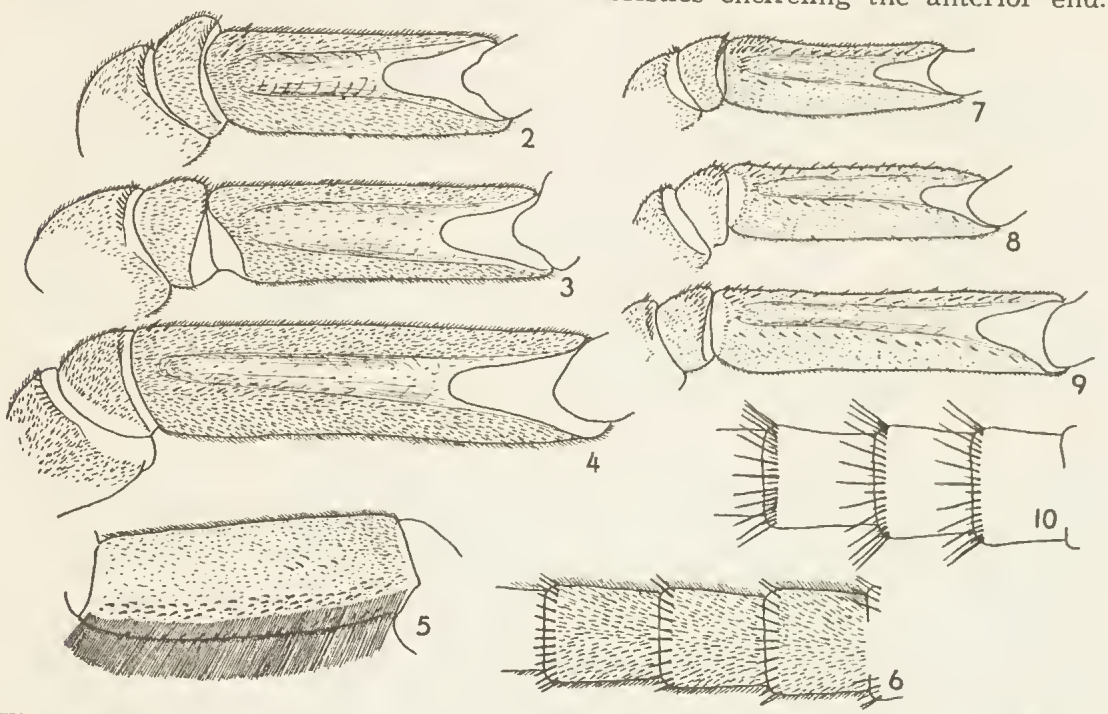
Thaumatoperla alpina Burns and Neboiss (1957).

Description of the nymph.

(Figures 2-10).

Colour dorsally: head olive, pronotum reddish brown with darker central patch, meso-and metathorax brown to olive brown; ventrally: head olive, thoracic segments light ochraceous buff with tinge of olive around the base of legs, abdomen deep olive buff, last segments olive brown to blackish; antennae yellow brown, cerci brownish.

Head slightly narrower than prothorax, widest at posterior third. A row of short stiff bristles just behind the eyes. Antennae up to 15 mm. long, consisting of approximately 100 segments, first segment large, second segment smaller, the following three or four segments very short, succeeding ones gradually increasing in length and becoming narrower towards the apex; each segment with a single row of small stiff bristles encircling the anterior end.



Figs. 2 - 6. *Thaumatoperla alpina* B. and N. nymph: 2, anterior femur ventrally; 3, median femur ventrally; 4, posterior femur ventrally; 5, anterior femur dorsally showing row of long hairs; 6, portion of cercus showing dense pubescence and the encircling row of spines around the distal margin.

Figs. 7-10. *Thaumatoperla flaveola* B. and N. nymph: 7, anterior femur ventrally; 8, median femur ventrally; 9, posterior femur ventrally; 10, portion of cercus.

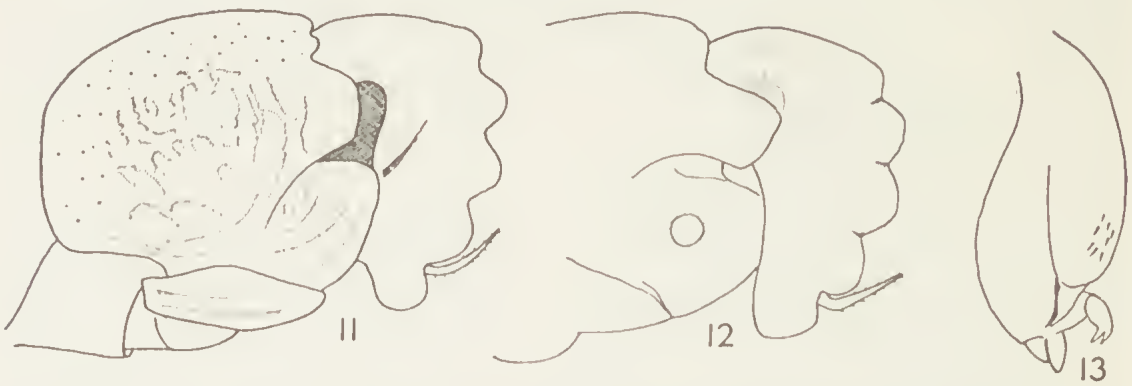
Labrum, labium, maxilla, maxillary palpae and mandibles are not sufficiently distinct from *Thaumatoperla flaveola* to warrant their use as distinguishing characters for separating the two species.

Pronotum show the typical colour pattern found in adults, but colours are not so bright. Short stiff bristles along lateral margins, but median section of anterior margin and the entire posterior margin without such bristles.

Legs densely covered with short pubescence, femorae ventrally without distinct spines (Figs. 2-4); femorae and tibiae dorsally with a row of fine, long whitish hairs.

Abdomen somewhat cylindrical, depressed dorso-ventrally, dorsally covered with variable size stout spines, ventrally with very sparse decumbent hairs and an occasional spine on all except the last three segments. First six segments each with a pair of pinkish to bluish lateral gills. Ninth segment the longest. Cerci up to 23 mm. long, with variable number of segments, reaching over 50, densely covered with short pubescence (absent in *Th. flaveola*); proximal segments very short becoming longer and narrower distally. Each segment bears an encircling row of short spines around the distal margin (Fig. 6), much shorter than in *Thaumatoperla flaveola* (Fig. 10.)

short and rounded; tarsus single segmented, long, pointed at apex. Median legs with femora and tibial short, short and broad, the latter with a pair of strong spines at the apex, and a distinct ridge on the outer surface which forms



Figs. 11-13. *Cylindracheta ustulata*, sp. nov.: 11, outer view of anterior leg; 12, inner view of anterior leg; 13, median tibia.

two blunt points near the apex; tarsi stout, two segmented, terminating in a pair of short claws. Posterior legs more slenderly built than the median pair, tibia with four strong spines at the apex, ridge on the outer surface short and ending in a blunt point apically; tarsi single segmented, short and pointed, without claws.

Length 36 mm.; prothorax — length 6·5 mm., width 5·8 mm.; cerci 1·6 mm.

Holotype ♀: Ayr. Nth. Qld. May, 1957, R. Gotts. (National Museum of Victoria collection). ♂ unknown.

This species is very close to the New Guinea species *C. longeva* Tind., but is separated by the smaller overall size, distinctly rounded lobes of the anterior tibia, and less angular inner apical projection of the anterior femur.

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Order TRICHOPTERA.

Family LIMNEPHILIDAE.

There has been only one species, *Archaeophylax ochreus* Mosely, of the family Limnephilidae known from Australia, with a distribution reaching from Tasmania in the south to Mt.

The description has been prepared from mature nymphs, which had reached the length up to 38 mm. At the same time also a number of smaller nymphs were collected (length 15-20 mm.), these were more uniformly coloured. Nymphs are usually found under stones in rapid parts of the stream and are very active.

Material was collected in a small stream on Mt. Mackay, Vic., 26th January, 1960, and are deposited in the National Museum collection.

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Order ORTHOPTERA.

Family CYLINDRACHETIDAE.

The discovery of a new species of Cylindracheta in North Queensland extends the known distribution of the genus to the north-eastern part of Australia. According to Tindale (1928) the genus is distributed over the whole of the arid parts of Australia (*C. psammophila* Tind.—W.A.; *C. arenivaga* Tind.—S.A., N.T.; *C. kochi* Sauss.—Nth. Austr.), in New Guinea (*C. longeva* Tind.) and Melville Island (*C. campbelli* Gray).

CYLINDRACHETA USTULATA, sp. nov.

(Figures 11-13).

The species is known from a unique female specimen.

Stout, cylindrical, chestnut-brown, abdomen slightly lighter in colour than the head and thoracic segments; medium and posterior tibiae yellowish brown. Head large, depressed anteriorly; antennae short, seven-segmented; third segment the smallest, apical segment concave; eyes oval, fenestrae conspicuous. Prothorax almost cylindrical, anterior margin moderately and evenly concave; antero-lateral spine well developed, mesothorax short, compressed posteriorly; metathorax compressed laterally to form a short and narrow dorsal ridge. Abdominal segments wider than long, anterior two compressed laterally, third segment somewhat conical, terminal segment with distinct transverse suture. Eight sternite only slightly longer than wide; cerci bluntly pointed, widest at base, about twice as long as the basal width. Anterior legs with femora stout, inner apical projection somewhat angular; the chitinous ridges of external surface broad, indistinct, not elevated; tibia stout with the five projecting lobes

Kosciusko area of New South Wales (Mosely and Kimmins, 1953; Neboiss, 1958). It has been limited always to mountainous districts of these states. The new species described hereunder, is also associated with a mountain region.

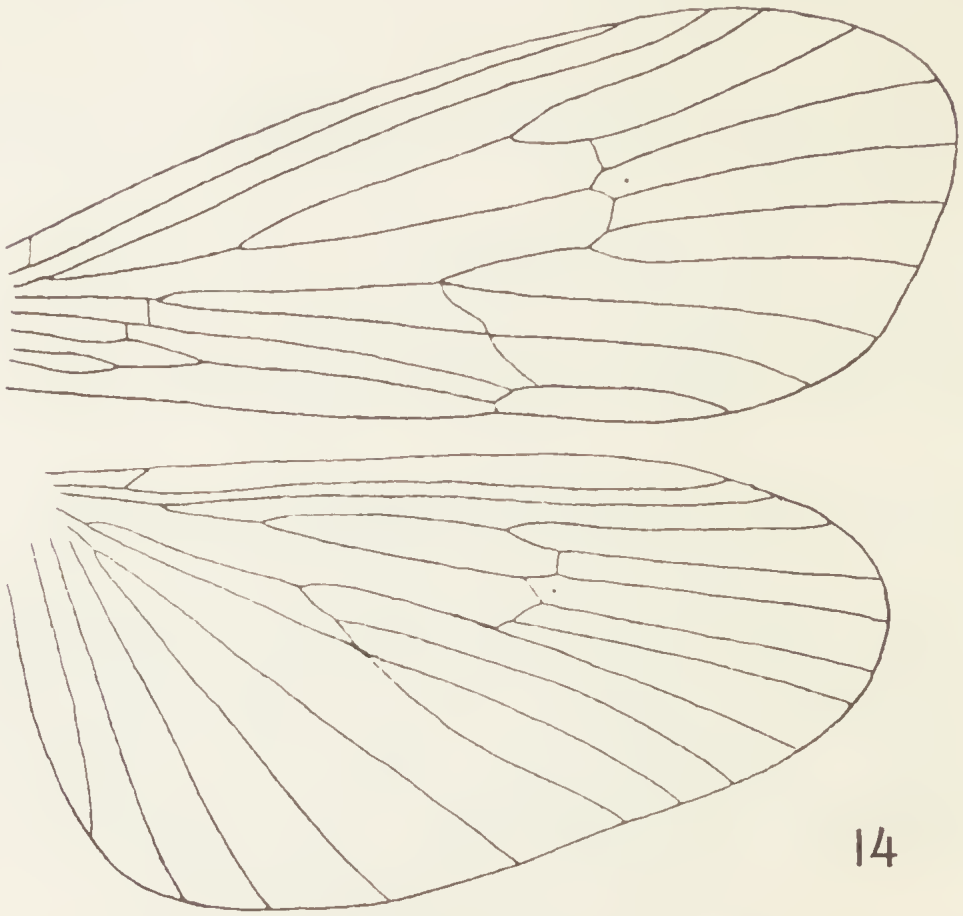


Fig. 14. *Archaeophylax canarus,* sp. nov.: wing venation.

Archaeophylax canarus, sp. nov.

(Figures 14-18).

Head, thorax and abdomen dark ochraceus, legs, antennae and anterior wings paler; the latter with very pale yellowish spots along costal margin; posterior wings very pale, slightly darker at apex. Spurs 1:2:2. Ocelli very prominent; the median one located anteriorly of the base of antennae; the two posterior ones just behind the base of antennae and close to the dorsal margin of eyes. No distinct warts on dorsal surface of head.

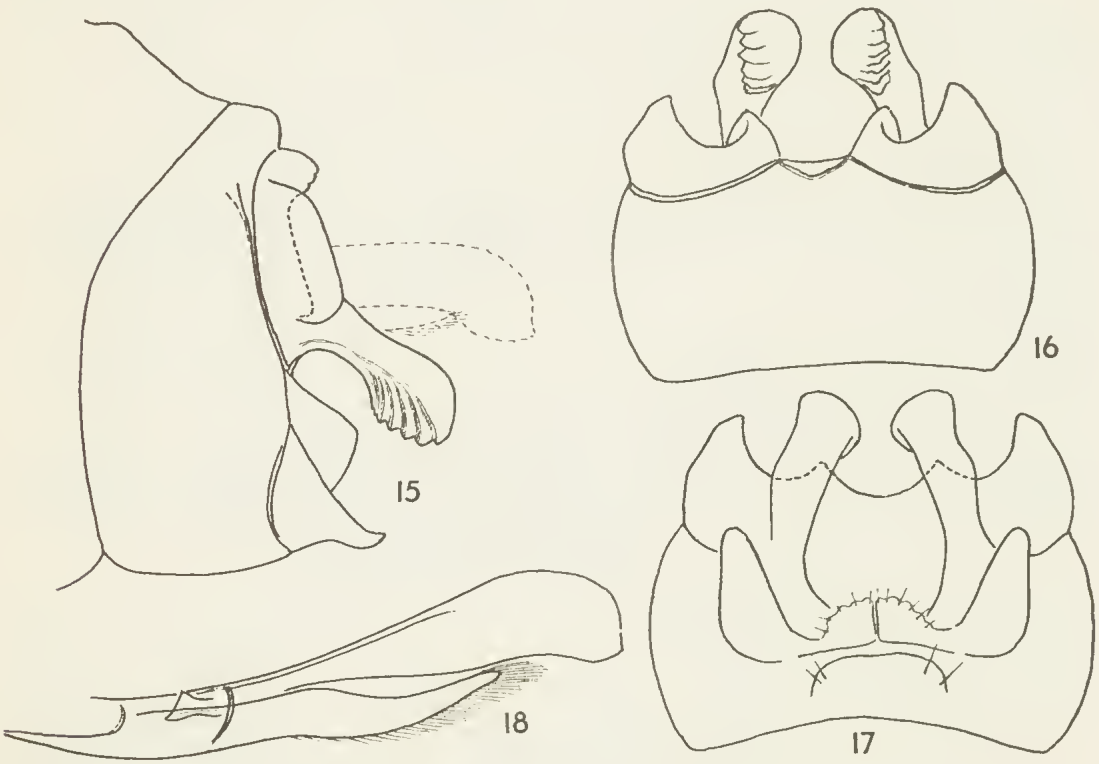
Genitalia, ♂—Dorsal plate very short, broad, with margin crenulate, covered with short hairs. Superior appendages short, flattened laterally, almost rectangular when viewed from side, long hairs along external margin. Upper penis cover formed by two separate processes, directed downward and inward; apex bulbous, ventrally with acute serrate ridge. Penis long, gradually

widening towards apex; sheats slightly curved, pointed at apex, ventrally with row of stout hairs. Inferior appendages short, triangular, curving inwards, covered with short hairs.

♀ unknown.

Length of the anterior wing: 12 mm.

Type material: Holotype ♂, Victorian Alps (prob. Mt. Buller area) (National Museum collection).



Figs. 15-18. *Archaeophylax canarus,* sp. nov.: 15, ♂ genitalia lateral; 16, ventral; 17, dorsal; 18, penis lateral.

Differs from the other Australian species by its smaller size, spotted costal area of the anterior wing, and very distinct genitalia.

The name is derived from an aboriginal name " canara " meaning " small ".

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Order COLEOPTERA.

Family TENEBRIONIDAE.

Blepegenes cicatricosa, sp. nov.

(Plate 1).

Elongate, black species with slightly bronze tinge, head and prothorax with waxy lustre, elytra with odd intervals seminitid; antennae, palpi and tarsi black.

Head distinctly protruding forward, narrowed at the base, frontal margin concave; antennae orbits raised; labrum rectangular, anterior margin concave; eyes narrow, oblique; antennae filiform, reaching just beyond posterior angles of the prothorax, slightly longer in males.

Prothorax wider than long, somewhat flattened, lateral margins rounded, only indistinctly subangulate; occasionally with slight depressions on either side of median line; anterior and posterior angles rounded.

Scutellum smooth, triangular. Elytra elongate, oval, only slightly flattened dorsally, evenly rounded at apex; odd intervals slightly convex, lateral ones even more than the median ones; even intervals planate, less nitid. Ventral surface smooth.

Tarsi and posterior section of tibiae reddish golden pilose beneath; anterior tarsi in male dilated.

Length 19-24 mm; width 7-8·5 mm.

Type material: Holotype ♂ and allotype ♀ (National Museum of Victoria collection); 3 ♂ 3 ♀ paratypes (E. T. Smith collection) all collected at Lowther, Blue Mountains, N.S.W., November, 1958, E. T. Smith.

Key to species of the genus *Blepegenes*

1. Sides of pronotum not spinose 2
   Sides of pronotum spinose 4
2. Elytra rounded at apex .. .. *cicatricosa*, sp. nov.
   Elytra terminates in a single spine at apex 3
3. All elytral intervals costate*) .. .. *nitidus* Blackburn.
   Elytral intervals costate only at sides .. .. *equestris* Pascoe.
4. Head with spines between base of antennae and eyes .. .. *aruspex* Pascoe
   Head without spines .. .. *lachrymosa* Carter.

Genus TRIBOLIUM Macleay.

A total of five species of the genus *Tribolium* have been recorded from Australia. Two of these are introductions (*confusum* and *castaneum*), but the remaining three (*myrmecophilum*, *antennatum* and *waterhousei*) are of Australian origin. To this latter group a new species (*apiculum*) is now added.

*) It should be noted that *nitidus* Blackburn is very difficult to separate from *equestris Pascoe*. The only distinguishing character given by Blackburn (1891) is that "*B. equestris* Pascoe, is a larger insect with the elytrae interstices costate only at sides". The unique type of *nitidus* is in the National Museum of Victoria collection, but as the abdomen has been damaged, the genitalia is not available for study. More material of *nitidus* is needed before satisfactory conclusions can be reached for separating the two species (*nitidus* and *equestris*).

Hinton (1948) produced an excellent key for separating *Tribolium* species of the world, and therefore only an abbreviated summary of characteristics is given here to facilitate identification of Australian species and to indicate the position of the new species described hereunder.

(*Numbers of couplets as in Hinton's Key*).

1. Pronotum with apex unmargined 6
6. Pronotum with base completely and distinctly margined .. 8
—. Pronotum with middle two thirds of base not margined .. .. (*myrmecophilum* Lea, *antennatum* Hinton).
8. Head with margins above eyes not elevated. Antennae club of three or five segments.. 17
—. Head with margins above eyes elevated to form a distinct ridge .. .. (includes *confusum* Jack Du Val).
17. Antenna with a sharply differentiated 3–segmented club 20
20. Head, pronotum, and elytra with numerous punctures not less than half as coarse as facets of eyes 21
21. Eyes separated beneath head by once or very little more than once the transverse diameter of the ventral part of an eye.. .. 23
23. Surface between punctures of head and pronotum dull or seminitid, with reticulate microsculpture. Elytra with one or more of intervals four to eight strongly carinate from base to apex .. 23A
—. Surface between punctures of head and pronotum smooth and strongly shining, without a visible microsculpture (at x 75). Elytra not or at most only indistinctly carinate .. .. (includes *waterhousei* Hinton.)
23A. (New section) Pronotum without large depressions on either side of median line .. .. *castaneum* Herbst.
—. Pronotum with large irregular depressions on either side of median line .. .. *apiculum,* sp. nov.

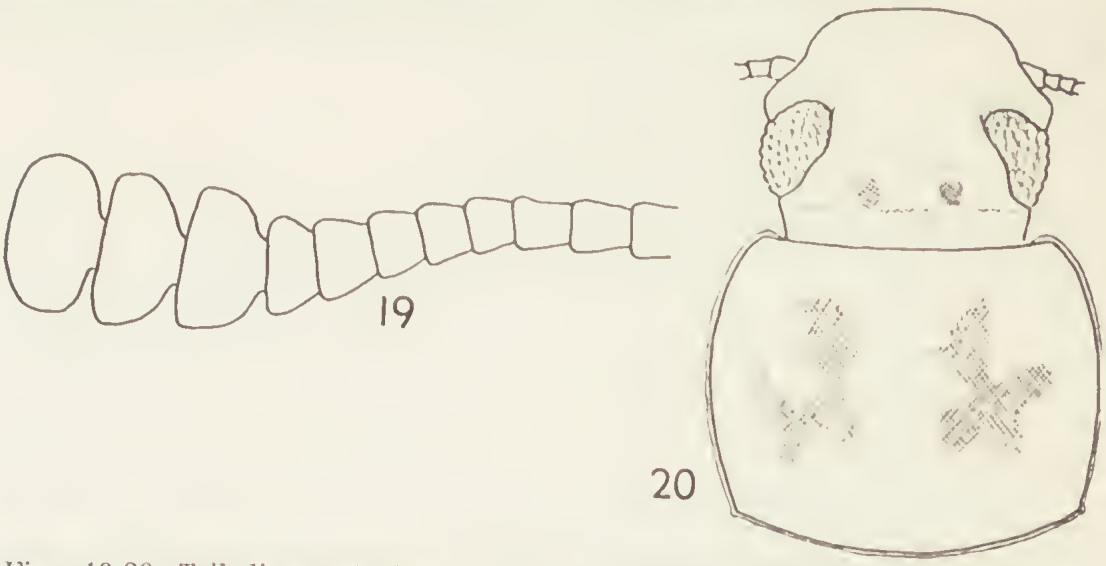
Tribolium apiculum, sp. nov.
(Figures 19-20).

Uniformly reddish brown species, body sub-parallel-sided, moderately convex with elytra somewhat depressed. Surface between punctures on the head and pronotum seminitid with fine but distinct microsculpture.

Head dorsally with moderately deep, round to elongate punctures, which are usually separated by about one or slightly less than one of their own diameters; a pair of depressions on the level with posterior margin of eyes; ventral surface smooth, very shiny. The narrowest part of eye as broad as six facets; eyes ventrally separated by less than the transverse (greatest) diameter of ventral part of an eye. Antenna with abruptly formed 3-segmented club; segments three to eight gradually widening (Fig. 19.)

Pronotum broader than long, posterior margin completely and distinctly carinate; lateral margin rather evenly rounded, anterior angles not produced forward beyond middle of anterior margin, latter not carinate; punctures mostly round, usually separated by approximately one to two of their own diameters; irregular shaped depdessions on either side of median line.

Elytra with first two or three intervals indistinctly, following ones distinctly carinate, striae with irregular row of dense punctures.



Figs. 19-20. *Tribolium apiculum*, sp. nov.: 19, antenna; 20, head and pronotum, shaded areas indicating depressions.

Females are separable from males by absence of the pit and associated brush of hairs on ventral side of anterior femur.

The carinate posterior margin of pronotum, distinctly 3-segmented antennal club, and presence of sub-basal ventral pit and associated brush of hairs on anterior femur in the male, indicates that this species belong to *castaneum* species-group, whereas general facia with its denser punctuation and somewhat rough surface greatly resembles *T. myrmecophilum* Lea.

This species was discovered by Dr. C. D. Michener in a nest of native bee *Trigona carbonaria* Smith. Length 4·9—5·0 mm.; width 1·7 mm.

Type material: Holotype ♂ and allotype ♀, Yarraman, Queensland. 16th February, 1959. C. D. Michener (National Museum of Victoria collection.)

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Family *ELATERIDAE*.

Hapatesus hirtus Candèze, (1863).

Description of larva.

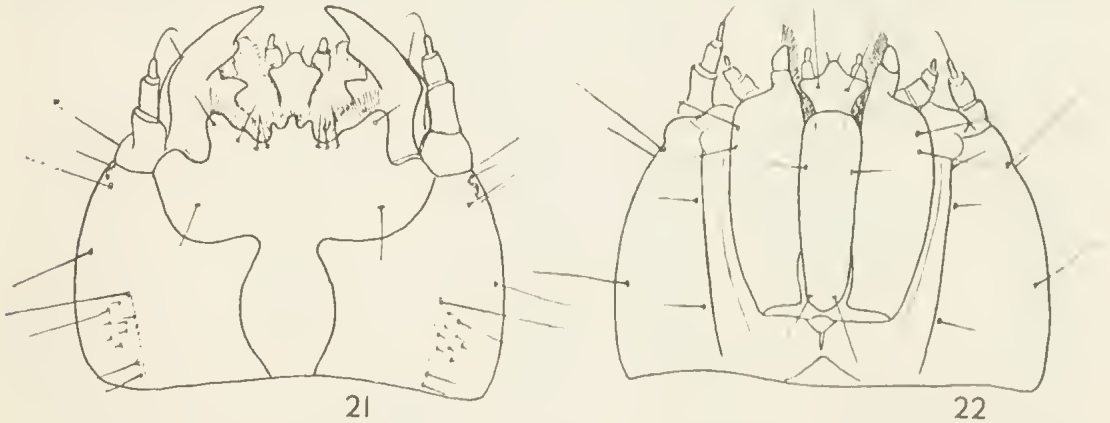
(Figures 21-26).

Larvae of this and some other not yet identified species are causing damage to potato crops in Gembrook area, Victoria. They were collected and bred by Mr. R. A. Van Baer of the Victorian Department of Agriculture and forwarded to the author for identification.

First reference to the larvae of *H. hirtus* was made by Baron von Müller (1891) in connection with damage done to the blue gum (*Eucalyptus globulus*). He refers to two wood boring beetles attacking these trees, but Froggatt (1923) queried the correctness of one being an elaterid. It is now certain that the larva of *H. hirtus* is not wood boring, as its presence in potatoes is typical of ground living larvae that feed upon various roots. Lea (1908) expressed the opinion that the larvae feed upon roots of beach plants on King Island, but since then it has been established (Neboiss, 1957) that his note refers to another species of the genus.

This is the first time that this species has been bred from larvae to adult stage, and it is therefore possible to describe larval characters. The natural food is still unknown, but it can be assumed that they would normally feed on roots of various plant species.

A number of specimens was available for examination, but their relative maturity is unknown. Body sub-cylindrical slightly depressed dorso-ventrally, the head and thoracic segments more so than the abdominal segments. Dorsal surface yellowish with pale narrow median line, thoracic segments and head gradually darkening, 9th segment yellowish brown; mandibles, nasale and apices of prongs almost black; ventral surface slightly paler than dorsum.



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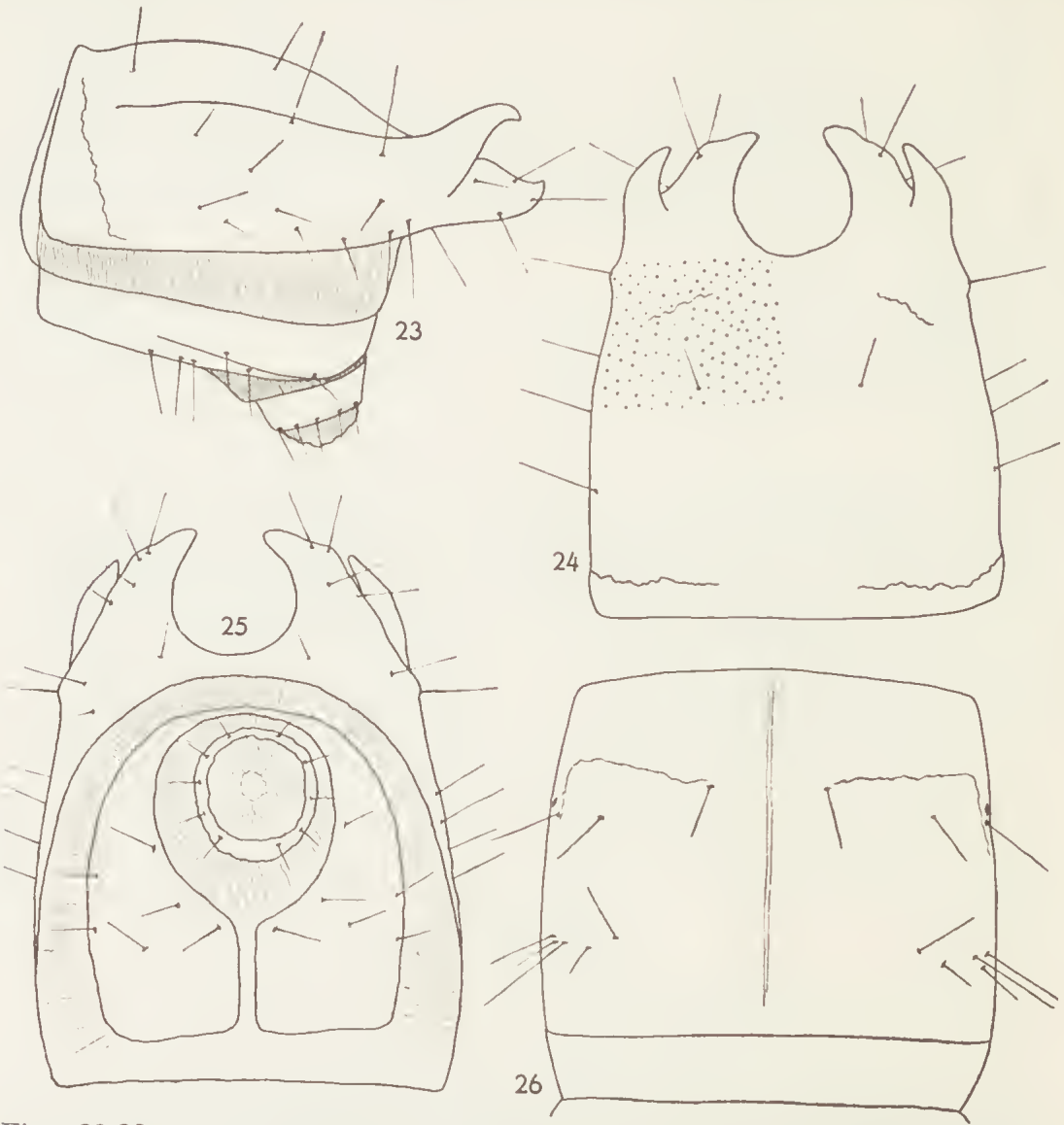
Figs. 21-22. *Hapatesus hirtus* Cand. larval head: 21, dorsal; 22, ventral.

Frontoclypeal region with posterior part extending back as far as foramen magnum. Nasale broad, terminating apically in three forward projecting denticles, two nasosulcal setae on each side of nasale. Paranasal lobes rounded apically, produced beyond nasale, each with a small single seta.

Epicranial plates very sparsely and finely punctate. Dorsal sulci rather indistinct, with one long anterior seta followed by a group of small setae. Ventral sulci with three setae. Eye spot indistinct. Mandibles slender, broad at base, suddenly narrowing at apical third, retinaculum well developed. Ventral mouth parts sub-parallel, stipes large sub-rectangular with two setae near antero-lateral angles. Maxillary palpae with segments sub-cylindrical narrowing towards apex. Postmentum with one pair of setae caudally and another pair approximately one-third from anterior end. Prementum somewhat cruciform with a pair of short setae at apex and another pair of longer ones just caudad of base of labial palpae.

Prothorax about three-quarter length of meso- and metathorax together; gradually narrowing anteriorly, wider than long. Two groups of setae one on either side of tergite; about five setae in anterior group but only three setae in posterior group.



Figs. 23-26. *Hapatesus hirtus* Cand. larva: 23, terminal segments lateral; 24, terminal segment dorsal, showing density of pits; 25, terminal segments ventral; 26, 7th segment dorsal.

Meso- and metathorax with only one seta near longitudinal branch of impression but with three setae near posterior margin. Abdominal tergites usually with three anterior and three to five posterior setae.

Legs short, sub-equal in length, covered with rows of short spines.

Ninth abdominal segment longer than wide. Dorsal surface somewhat flattened, covered with small round pits; caudal notch round; urogomphi separate, robust, bifid, with inner prongs directed inwardly, longer and stouter than outer prongs; the latter projecting upward and inward. Tenth abdominal segment surrounded by ten short rather prominent setae.

Length up to 23 mm. (fully distended 27·5 mm); width 2·5 mm.

Terminology is that used by Glen (1950).

Material examined: Fourty specimens Gembrook, Vic. June, 1959 and April, 1960. R. A. van Baer. (Specimens in Plant Research Laboratories and National Museum of Victoria collections.)

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