

A review of the Australian Tachyine beetles of the subgenera *Tachyura* Motschoulsky and *Sphaerotachys* Müller, with special regard to the tropical fauna

(Insecta, Coleoptera, Carabidae, Bembidiinae)*

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Abstract

The Australian species of the subgenera *Tachyura* Motschoulsky and *Sphaerotachys* Müller of the genus *Elaphropus* Motschoulsky are reviewed and compared in a key. The species are redescribed, pictured, and their distribution is mapped. All species, formerly included in genus *Tachys* Stephens, are transferred to *Elaphropus*. Following species are newly described: *Elaphropus subopacus* spec. nov., *E. leptothorax* spec. nov., *E. ordensis* spec. nov., *E. brittoni* spec. nov., *E. pseudoconvexus* spec. nov., *E. didymus* spec. nov., *E. convexicollis* spec. nov., and *E. denticollis* spec. nov. The ranges of several species are considerably extended through Northern Territory and northwestern Australia.

A phylogenetical analysis of the Australian species is attempted using a number of character states and trends. Subgenus *Tachyura* is in Australia divided in 8 species-groups of very different evolutionary status. Actually, the *amplipennis*-group includes some of the most primitive *Tachyura* on the whole, *convexus*-group and *spenceri*-group include most derivative species.

From phylogenetical analysis and from recent distribution thoughts on the faunal history of *Tachyura* and *Sphaerotachys* in Australia are derived. Three main evolutionary events are recognized within *Tachyura*, very approximately dated to the last glaciation period, to about mid-Pleistocene, and to Pliocene or earlier. Pliocene differentiation of species-groups is reflected by the vast range of several species from nearly all species-groups. During early to mid-Pleistocene some northern dry country barriers prevented further range spreading of some species, and in late Pleistocene northern refugia promoted evolution of new species with limited ranges. Hence, the wet tropical part of Northern Territory and of northwestern Australia today harbours a similar species diversity as northeastern Queensland.

Introduction

The Tachyine fauna of Australia is rather well documented due to the excellent work done by SLOANE (1896, 1903, 1921) who critically reviewed the various older species described especially by Macleay and Blackburn. With regard to the subgenera *Tachyura* and *Sphaerotachys* few has been added since Sloane's time to the knowledge of taxonomy and distribution of these species. Only a single additional species, *Tachys convexulus*, was described by DARLINGTON (1963).

Most species of subgenus *Tachyura* and the single Australian species of *Sphaerotachys* are recorded from tropical Queensland, very few species occur apparently in southeastern Australia and just some species are cited from Northern Territory and from northwestern Australia. This is perhaps due to the inaccessibility of the Northwest, hence the fauna of this part of Australia is still very unsatisfactorily known.

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During a travel through northern and northwestern Australia, carried out by the author in 1984, several species still unrecorded from this area, as well as several new species were discovered. The ranges of several species were considerably extended, and it became also evident that the fauna of northern and northwestern Australia is by no means less diverse than the fauna of tropical Queensland. During determination of the whole unidentified material of the subgenera *Tachyura* and *Sphaerotachys* from the Australian National Insect Collection still some additional new species were discovered. Thus a general review of all species is justified, the more, as some older descriptions are by no means detailed or even practicable. Since several species are common and well known, typical material was inspected only in some critical cases. Altogether, the review is based on the examination of more than 10 500 specimens, most from the northern parts of Queensland, Northern Territory, and Western Australia.

Workers in different regions of the world do not agree, how the large genus *Tachys* should be divided into reasonable subunits. Whereas most European scientists preserved the old genus *Tachys* and used the old subgenera based on the Palearctic Tachyine fauna, people working on tropical *Tachys* (e. g. ANDREWES 1925, DARLINGTON 1962) preferred the use of species-groups rather than of subgenera. In the most recent paper on Tachyine beetles (ERWIN 1974) the genus *Tachys* is divided into several new genera (formerly subgenera), and *Tachyura* and *Sphaerotachys* are classed within the new genus *Elaphropus*. This opinion is followed here as the most recent classification. However, justification of this classification would be only possible by a revision of the world fauna. For settling the synonymy of the subgenera here used for the Australian fauna with Darlington's work on the fauna of New Guinea, subgenus *Tachyura* can be equalized with the *politus*-group, and *Sphaerotachys* with the *fumicatus*-group of DARLINGTON (1962). Both groups, or subgenera, respectively, are closely related, and the most striking difference is the strongly converging frontal furrows in *Sphaerotachys*.

As DARLINGTON (1962) stated, the Australian Tachyine fauna is not closely related to anyone other fauna, not even to the fauna of neighbouring New Guinea. This is especially true in the subgenus *Tachyura*, where apparently only two Australian species occur outside of Australia.

Certainly, subgenus *Tachyura*, or *politus*-group contains rather related species. However, *Tachyura* perhaps does not constitute a monophyletic unit, it is rather a paraphyletic assembly. But this question is only soluble by a revision of the world fauna. This opinion is supported by the presence of some well defined subunits within Australian *Tachyura*, which could be well given an own name each. That subdivision reflects strong differences of evolutionary states within *Tachyura*. In this review these units are classed in 8 species-groups.

Acknowledgements

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A large amount of the material considered was collected during two travels, carried out by the author in 1981/82 (Queensland) and 1984 (northern and northwestern Australia). This second trip was supported by a travel grant from the Deutsche Forschungsgemeinschaft (DFG). At this place, I want to thank once more the authorities of the DFG.

Abbreviations of collections used in text

AMS	– Australian Museum, Sydney
ANIC	– Australian National Insect Collection, Canberra
BMH	– Bernice P. Bishop Museum, Honolulu
BMNH	– British Museum Natural History, London
CBM	– Collection M. Baehr, München

DEI	– Deutsches Entomologisches Institut, Eberswalde
FMT	– Museum G. Frey, Tutzing
MMS	– Macleay Museum, Sydney
MNHN	– Museum National de l'Histoire Naturelle, Paris
NMV	– National Museum of Victoria, Melbourne
SAM	– South Australian Museum, Adelaide
ZSM	– Zoologische Staatssammlung, München

Methods

Measurements

Measurements were made under a stereo-microscope using an ocular micrometer. Length of specimens has been measured from tip of labrum to apex of elytra.

Distribution maps

Distribution maps are based on label data of examined specimens, in some species also on reliable literature records. Label data of older specimens are sometimes impossible to localize. These data and also pure state records are not indicated in the maps. In several cases, e. g. in western Arnhem Land, one point on the maps may include several adjacent localities. In some species the southern boundary of range may not be correctly defined, as most material studied is from tropical Australia.

Characters

Most *Tachyura* species are morphologically characteristic enough to enable differentiation without considering ♂ genitalia and without use of sophisticated measurements. Most valuable characters are: Number and length of elytral striae; form of shoulder angle; elytral pattern and colour; presence or absence of microsculpture; shape of pronotum, especially structure of posterior angles and of basal transverse impression; relative length of antennal segments; and general body shape.

♂ aedeagus is structurally rather similar, although there are some differences in form, shape of apex, and number and position of setae on parameres (especially left paramere). These characters are more valuable in differentiation of closely related species than for distinguishing of species-groups.

Classification

For discussion of status and of limitation of subgenera see introduction. I follow with some hesitation the procedure of ERWIN (1974) who allotted generic rank to *Elaphropus* Motschoulsky, while *Tachyura* Motschoulsky and *Sphaerotachys* Müller are recognized subgenera of *Elaphropus*.

Key to all Australian species of Tachyura and Sphaerotachys

- 1. Number of striae complete, 7th stria not shortened, colour light brown 2.
- Number of striae incomplete or 7th stria shortened anteriorly and posteriorly, colour dark or light reddish 4.
- 2. Striae not doubled, each elytron with 8 striae. Microsculpture of pronotum fine. Larger species: 3–3.55 mm 3.
- Striae doubled, each elytron with 17 narrow ridges. Microsculpture of pronotum very conspicuous, transverse. Smaller species: 2.65–3.25 mm *E. nervosus* (Sloane)
- 3. Prothorax wide, ratio width/length over 1.45. Posterior angles laterally projecting, less than 90°, base behind transverse impression with some longitudinal wrinkles *E. amplipennis* (Macleay)
- Prothorax narrower, ratio width/length under 1.4. Posterior angles not laterally projecting, over 90°. Base behind transverse impression without longitudinal wrinkles *E. victoriensis* (Blackburn)

4. Clypeus with conspicuous, straight, convergent furrows, elytra bistrate, bimaculate, maculae vaguely defined. Length: 2–2.2 mm *E. curticolis* (Sloane)
- Clypeus without conspicuous convergent furrows 5.
5. 5th stria meeting basal border 6.
- 5th stria not meeting basal border 7.
6. 7-striate, dark brown, rather convex. Smaller, length: 2.3–2.65 mm *E. banksi* (Sloane)
- 6-striate, only traces of 7th stria visible, black, rather elongate. Larger, length: 2.95–3.25 mm
. *E. buprestoides* (Sloane)
7. 6-striate 8.
- With 5 or less striae 10.
8. Bimaculate, dark brown, iridescent, with distinct microsculpture. Length: 2.4–2.65 mm
. *E. subopacus* spec. nov.
- Unimaculate, black 9.
9. With fine microsculpture. Base of pronotum rather wide, as wide as apex. Length: 2.1–2.6 mm
. *E. bipustulatus* (Macleay)
- Without microsculpture, surface glossy. Base of pronotum less wide, narrower than apex. Length:
2.4–3.1 mm *E. bembidiiformis* (Jordan)
10. 5-striate 11.
- At most 3-striate, 3rd stria obsolete 14.
11. Unimaculate, with fine microsculpture. Length: 2.7–3.1 mm *E. solidus* (Sloane)
- Bimaculate, without microsculpture, surface glossy 12.
12. Elongate, pronotum rather narrow, c. as wide as head including eyes. Anterior macula elongate, nearly
attaining base. Elytral striae originating at same level. Length: 2.95–3.2 mm . . *E. leptothorax* spec. nov.
- Wider, pronotum wide, much wider than head including eyes. Anterior macula not attaining base.
Elytral striae successively removed from base 13.
13. Pronotum wider, laterally more convex, shortly sinuate in front of posterior angles. Elytra shorter and
wider, laterally distinctly convex, apex regularly rounded. Antennae apically not infusate. Larger,
length: 2.65–2.85 mm *E. ordensis* spec. nov.
- Pronotum narrower, laterally less convex, sinuosity in front of posterior angles more elongate. Elytra
longer, less wide, sides gradually narrowed, apex wedge-shaped. Antennae perceptibly infusate to apex.
Smaller, length: 2.5–2.65 mm *E. striolatus* (Macleay)
14. Posterior angles of pronotum normal, neither dentiform, nor removed from base, nor completely
rounded off 15.
- Posterior angles of pronotum dentiform, or removed from base, or completely rounded off 17.
15. Unimaculate, macula very large, ground colour black. Length: 2.75–2.95 mm
. *E. ovensensis* (Blackburn)
- Bimaculate, ground colour reddish or brown 16.
16. Larger, length: 2.25–2.45 mm. Ground colour reddish to light brown, anterior macula large, ill defined .
. *E. flavicornis* (Sloane)
- Smaller, length: 2–2.25 mm. Ground colour dark brown, anterior macula small, well defined
. *E. brittoni* spec. nov.
17. Posterior angles of pronotum rounded off. Length: 2.4–2.8 mm *E. iaspideus* (Sloane)
- Posterior angles of pronotum not rounded off, more or less dentiform 18.
18. Elongate. No prebasal transverse impression present 19.
- Convex. Prebasal transverse impression present 20.

19. Larger, length: 2.5–2.75 mm. Ground colour reddish, anterior macula large, rather ill defined. Elytra more elongate, considerably sinuate behind shoulders *E. spenceri* (Sloane)
- Smaller, length: 2.2 mm. Ground colour piceous, anterior macula small, well defined. Elytra wider, more convex, less sinuate behind shoulders *E. denticollis* spec. nov.
20. Unistriate 21.
- 3-striate, 3rd stria very short, rather inconspicuous. Length: 2.1–2.2 mm *E. pseudoconvexulus* spec. nov.
21. Larger, length: 2.25–2.7 mm. Transverse basal impression of pronotum with 5 large foveae 22.
- Smaller, length: 2–2.25 mm. Transverse prebasal impression of pronotum finely punctate *E. convexulus* (Darlington)
22. Pronotum wide, regularly convex, not sinuate in front of posterior angles. Colour reddish to brown, maculae very indistinct, ill defined, anterior macula large. Aedeagus with elongate apex, apex of left paramere wide, asymmetrically convex, setae inserted near lower edge. Length: 2.3–2.6 mm *E. convexicollis* spec. nov.
- Pronotum less wide, less regularly convex, with more or less distinct sinuosity in front of posterior angles. Colour dark piceous, surface very glossy, maculae on elytra very distinct, anterior macula smaller. Aedeagus with or without elongate apex, apex of left paramere narrow or wide, then asymmetrically convex 23.
23. Slightly larger, length: 2.4–2.7 mm. Maculae larger, posterior macula reaching to lateral border and medially to between 2nd and 1st stria. Pronotum slightly narrower, distinctly sinuate or straight in front of posterior angles. Aedeagus without elongate apex, apex of left paramere narrow, not convex, setae not inserted near lower edge *E. convexus* (Macleay)
- Slightly smaller, length: 2.25–2.5 mm. Maculae smaller, posterior macula normally not attaining lateral border, medially to between 3rd and 2nd stria. Pronotum slightly wider, sides more regularly convex, just slightly sinuate in front of posterior angles. Aedeagus with elongate apex, apex of left paramere wide, asymmetrically convex, setae inserted near lower edge *E. didymus* spec. nov.

The species

In the redescriptions of the known species only characters of major significance are concerned.

Subgenus *Tachyura* Motschoulsky, 1862

Diagnosis (for Australian species)

Convex beetles with full number of elytral striae to only 1 stria, in one species striae are duplicated. Striae well impressed, intervals rather convex. 9th interval convex, 8th stria deeply impressed. Elytra with 2 setiferous punctures on disc and a puncture within recurrent stria. Punctures on disc at or near 3rd stria. Recurrent apical stria free, sometimes in connection with a dorsal stria, then difficult to detect. Labrum without conspicuous ocellae. Frontal furrows short, not conspicuously convergent.

amplipennis-group

Diagnosis

Primitive group, characterized by fully striate elytra, basal border with distinct angle and in contact with 5th stria, recurrent stria in contact with 7th stria, and pronotum with elongate submarginal basal carina.

Elaphropus amplipennis (Macleay, 1871), new combination
(Figs 1, 3, 26, 47)

Macleay, 1869–73 (1871), p. 119 (*Bembidion*)

SLOANE 1903, p. 577; 1921, p. 200 (*Tachys*)

CSIKI 1929, p. 168 (*Tachys*)

Types (not seen): Syntypes in ANIC and AMS.

Type locality: Gayndah, southeastern Queensland.

Diagnosis

A large, reddish species with elytral striae not duplicated, and with wide pronotum with some longitudinal wrinkles at base.

Description

Measurements: Length: 3–3.55 mm; width: 1.3–1.55 mm; ratio width/length of pronotum: 1.47–1.52; ratio length/width of elytra: 1.38–1.43.

Colour: Reddish to light brown, elytra at shoulders and laterally at apex slightly lighter. Mouthparts, antennae, and legs yellow.

Head: Eyes very large, nearly attaining apex of pronotum. Surface with fine isodiametric microsculpture. Antennae surpassing base of pronotum by c. 2 segments. Median segments c. 1.75× as long as wide.

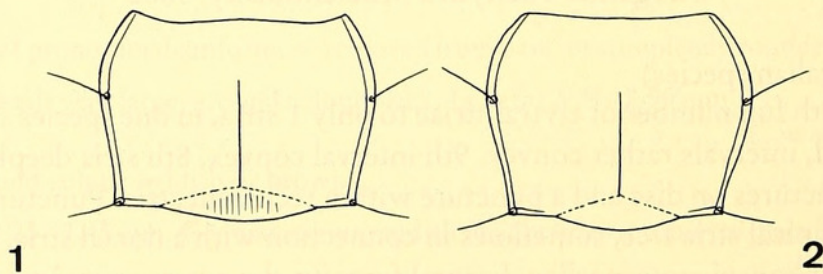
Pronotum: Wide, apex nearly straight, anterior angles slightly produced, acute. Sides slightly sinuate in front of posterior angles. Angles c. 90°. Base slightly wider than apex, only median lobe slightly produced. Prebasal transverse impression deep, interrupted in middle, laterally with c. 8 small punctures. Lateral carina straight, nearly $\frac{1}{3}$ of length of pronotum. Surface with very fine isodiametric microsculpture. Base behind transverse impression with short longitudinal wrinkles.

Elytra: Fully striate, intervals convex. Elytra widest in 1st quarter, then rather straight. Basal border with distinct angle and in contact with 5th stria. Recurrent stria in contact with 7th stria, other striae reaching very near to base and to apex.

Aedeagus (Fig. 26): Short, apically very wide, apex rounded. Internal sac complexly coiled. Both parameres 3-setose.

Variation: A very homogenous species throughout of its range, but the few specimens seen from Queensland rather large.

Distribution (Fig. 47): Queensland from Gayndah to about Cooktown; northwestern Australia as far south as Gascoyne River near Carnarvon.



Figs 1, 2. Pronotum. 1. *Elaphropus amplipennis* (Macleay); 2. *E. victoriensis* (Blackburn).

Material examined (c. 100): Queensland: 35 km w. Mackay (CBM). Western Australia: Ord River, 105 km N. of Hall's Creek (ANIC, CBM, ZSM); Mary River, 115 km WSW. of Hall's Creek (CBM); 108 km WSW. of Hall's Creek (CBM); Ashburton River, near Nanutarra Roadhouse (CBM); Gascoyne River, 15 km N. of Carnarvon (CBM).

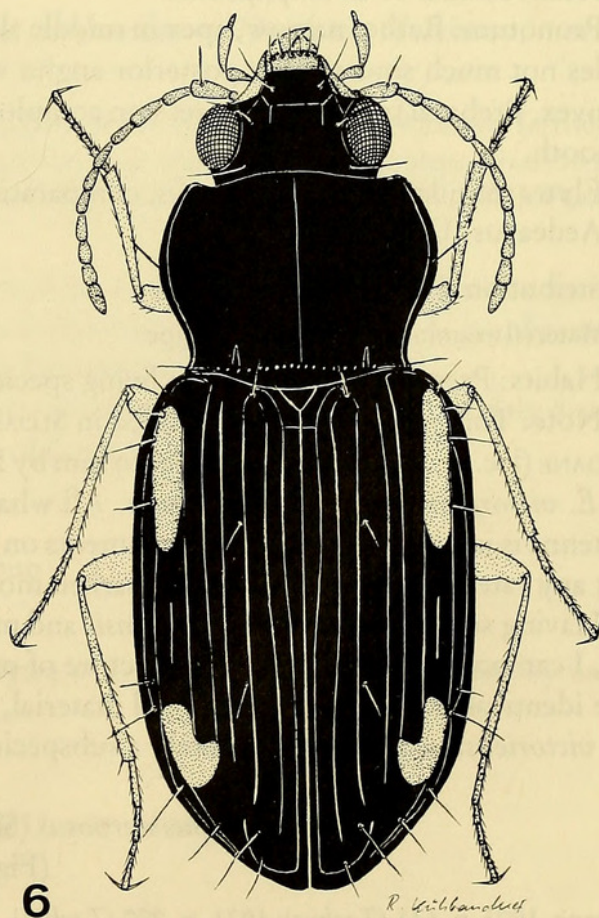
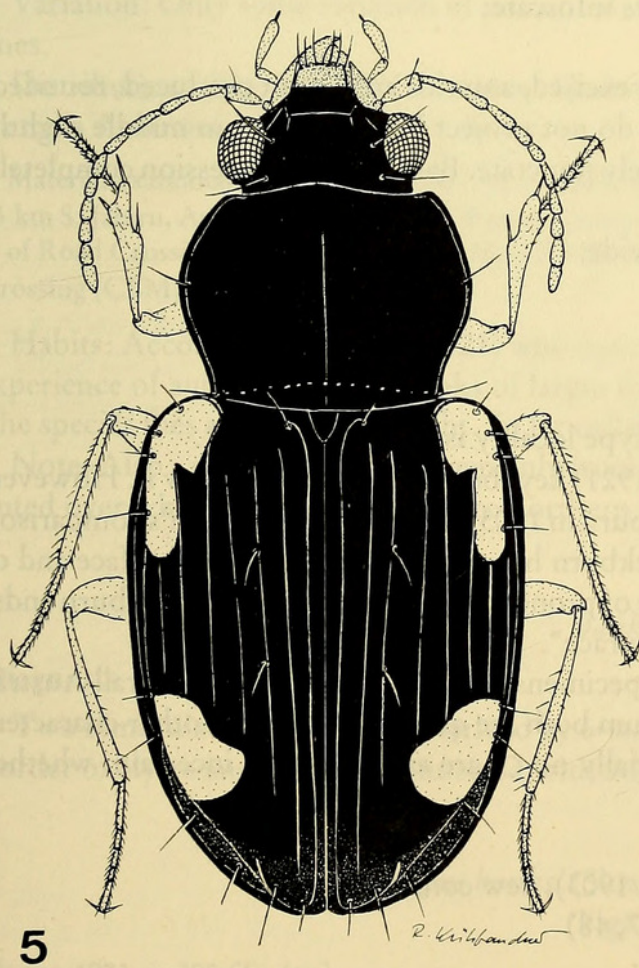
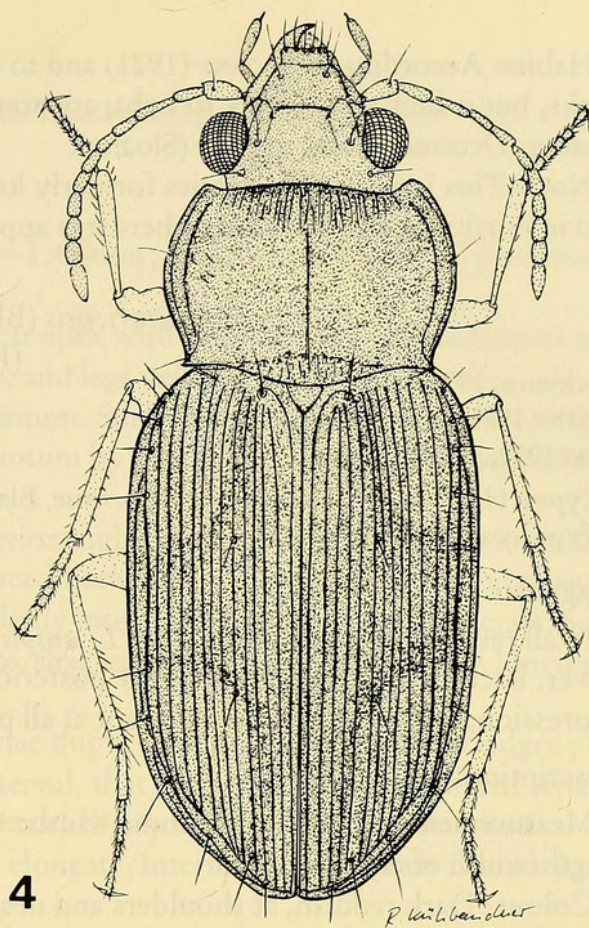
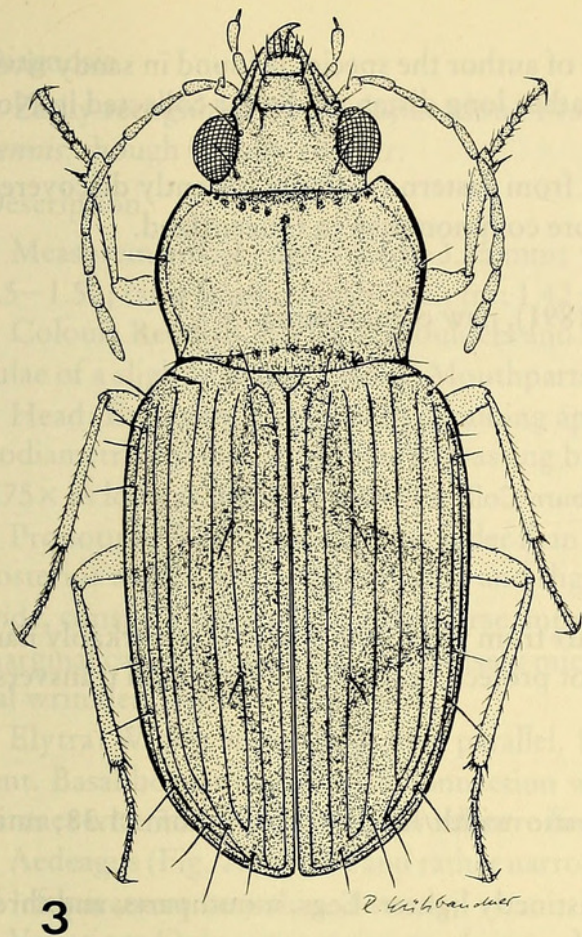


Fig. 3–6: *Elaphropus*.

3. *E. amplipennis* (Macleay), length: 3.3 mm; 4. *E. nervosus* (Sloane), length: 2.9 mm; 5. *E. banksi* (Sloane), length: 2.45 mm; 6. *E. buprestoides* (Sloane), length: 3.2 mm.

Habits: According to SLOANE (1921) and to experience of author the species is found in sandy river banks, but it flies also readily to light, apparently over rather long distances. So far collected in November, December, and in June (Sloane).

Note: This is one of the species formerly known only from eastern Australia, recently discovered also in northwestern Australia, where it is apparently more common than in Queensland.

Elaphropus victoriensis (Blackburn, 1891), new combination

(Figs 2, 47)

Blackburn, 1891, p. 785 (*Bembidion*)

SLOANE 1921, p. 200 (*Tachys*)

CSIKI 1929, p. 202 (*Tachys*)

Types: Holotype: ♀, „*Bembidion victoriense*, Blackb., Blackburn Coll. 1910–236“ (BMNH).

Type locality: „Victorian Alps“.

Diagnosis

In all respects extremely similar to *E. amplipennis*, apart from pronotum which is remarkably narrower, laterally more convex, has the posterior angles not projecting, no wrinkles behind transverse impression, and the anterior angles not at all produced.

Description

Measurements: Length: 3.55 mm; width: 1.55 mm; ratio width/length of pronotum: 1.38; ratio length/width of elytra: 1.45.

Colour: Dark reddish, at shoulders and near apex indistinctly lighter. Legs, mouthparts, and three basal segments of antennae yellow, terminal segments infusate.

Head: Similar to *E. amplipennis*.

Pronotum: Rather narrow, apex in middle slightly excised, anterior angles not produced, rounded. Sides not much sinuate near posterior angles which do not project laterally. Base in middle slightly convex. Prebasal transverse impression complete, finely punctate. Base behind impression completely smooth.

Elytra: Similar to *E. amplipennis*, comparatively wide.

Aedeagus: Unknown.

Distribution (Fig. 47): Victoria.

Material examined (1): Only holotype.

Habits: Presumably a mountain living species, as type locality is „Victorian Alps“.

Note: This species was not included in SLOANE's (1921) key, because he did not know it. However, SLOANE (l. c. p. 200) cites a letter sent to him by Blackburn in 1903, containing Blackburn's comparison of *E. victoriensis* with *E. amplipennis*. All what Blackburn has to say about colour of surface and of antenna is insignificant. Only his comments on shape of pronotum are of some value. Blackburn ends: "at any rate *T. victoriensis* is a well marked mountain race".

Having seen the type of *E. victoriensis* and many specimens of *E. amplipennis* from overall Australia, I can not say much more. In structure of pronotum both are quite different, but other characters are identical. As far as no additional material, especially no ♂ are available, it is uncertain, whether *E. victoriensis* is a species or merely a subspecies.

Elaphropus nervosus (Sloane, 1903), new combination

(Figs 4, 27, 48)

Sloane, 1903, p. 641 (*Tachys*); 1921, p. 200 (*Tachys*)

CSIKI 1929, p. 189 (*Tachys*)

Types (not seen): Holotype in Sloane Coll. (ANIC).

Type locality: Townsville, Queensland.

Diagnosis

Easily recognized by the duplication of 1st–8th striae. In other respects rather similar to *E. amplipennis*, though slightly smaller.

Description

Measurements: Length: 2.65–3.25 mm; width: 1.2–1.45 mm; ratio width/length of pronotum: 1.5–1.52; ratio length/width of elytra: 1.42–1.46.

Colour: Reddish. Elytra at shoulders and laterally near apex with large, though very indistinct maculae of a slightly lighter colour. Mouthparts, antennae, and legs yellow.

Head: Eyes very large, nearly attaining apex of pronotum. Surface densely microreticulate with c. isodiametric meshes. Antennae surpassing base of pronotum by c. 1.5 segments. Median segments c. $1.75\times$ as long as wide.

Pronotum: Wide, base slightly wider than apex. Anterior angles acute, produced. Sides sinuate near posterior angles, angles rather acute and slightly produced backwards, less than 90° . Lateral channel wide, conspicuous. Prebasal transverse impression medially interrupted, indistinctly punctate. Submarginal carina straight. Surface densely microreticulate, shagreened, at apex and base with longitudinal wrinkles, laterally coriaceous.

Elytra: Widest at 1st third, then parallel. 1st–8th striae duplicated, hence c. 17 narrow ridges present. Basal border angulate, in connection with 5th interval, that is the 9th ridge. Recurrent stria in contact with 7th interval. Microsculpture fine, isodiametric. Elytra far less dull than pronotum.

Aedeagus (Fig. 27): Short and rather narrow, apically elongate. Internal sac complexly folded. Apex of left paramere very thin, 2-setose.

Variation: Only some variation of size noted; Queensland specimens tend to be larger than western ones.

Distribution (Fig. 48): Northeastern Queensland, northernmost Northern Territory, north-western Australia south to Fitzroy River.

Material examined (70): Queensland: Mc Leod River, 18 km W. of Mt. Carbine (CBM). Northern Territory: 13 km S. Jabiru, Arnhem Land (CBM). Western Australia: Ord River near Ivanhoe (CBM); Denham River, 18 km S. of Road Crossing to Hall's Creek (CBM); Ord River, 105 km N. of Hall's Creek (ANIC, CBM, ZSM); Fitzroy Crossing (CBM).

Habits: According to SLOANE (1921) who described well the rapid movement of this species, and to experience of author, in sandy banks of larger rivers, sometimes in community with *E. amplipennis*. The species flies also readily to light. So far collected in November, January, and July.

Note: Also a species thus far known only from northeastern Queensland, but actually widely distributed over whole tropical Australia to northern fringe of Great Sandy Desert.

banksi-group

Diagnosis

Two bimaculate species, characterized by 6-striate elytra with at least a rest of 7th stria, and by basal border of elytra angulate and connected with 5th stria.

Elaphropus banksi (Sloane, 1921), new combination
(Figs 5, 28, 49)

Sloane, 1921, p. 200 (*Tachys*)

CSIKI 1929, p. 169 (*Tachys*)

Types (not seen): Syntypes in Sloane Coll. (ANIC).

Type locality: Normanby River at Kings Plains Cattle Stn., northeastern Queensland.

Diagnosis

A small, convex species, distinguished by compact body form, well developed 7th elytral stria, rather brownish colour, and anterior macula attaining elytral base.

Description

Measurements: Length: 2.3–2.65 mm; width: 1.05–1.2 mm; ratio width/length of pronotum: 1.39–1.42; ratio length/width of elytra: 1.42–1.44.

Colour: Head and pronotum dark piceous, with slight greenish tinge, elytra slightly lighter, two large maculae yellow. Anterior macula elongate, attaining base, medially attaining 5th stria. Posterior macula attaining 4th stria. Mouthparts, antennae, and legs dark yellow, last abdominal segments light brown to yellow.

Head: Convex, eyes large, removed from apex of pronotum. Microsculpture dense, conspicuous, isodiametric. Neck rather wide. Antennae short, attaining base of pronotum, median segments nearly as wide as long.

Pronotum: Convex, rather wide, apical angles produced, rounded off. Sides sinuate, posterior angles acute, c. 90°. Base nearly straight, median lobe slightly produced. Base slightly wider than apex. Prebasal transverse impression deep, not interrupted, finely punctate. Surface with dense, conspicuous, isodiametric microsculpture.

Elytra: Short, convex, sides in middle nearly parallel. Striae deeply impressed, intervals convex. Apart from 1st and 5th, striae not attaining base, 7th short, though distinct. Border at base arcuate, though not distinctly angulate, contiguous with 5th stria. Surface conspicuously microreticulate with rather irregular, slightly transverse meshes.

Aedeagus (Fig. 28): Narrow, tapering to apex, apex rounded, rather compact. Inner sac strongly folded. Both parameres 3-setose.

Variation: Only some variation of size noted.

Distribution (Fig. 49): Widely distributed in northeastern Queensland, northernmost Northern Territory, and northwestern Australia to northern fringe of Great Sandy Desert.

Material examined (ca. 400): Queensland: Kings Plains (ANIC); Mc Leod River, 18 km W. of Mt. Carbine (CBM); Rollingstone (ANIC); Hopevale Mission (ANIC). Northern Territory: 48 km SSW. of Borooloola (ANIC); Cape Crawford (ANIC); Nourlangie Creek, Mt. Cahill, Koongarra, Cooper Creek, Baroalba Creek, all western Arnhem Land (ANIC); Mudginbarry (ANIC, CBM); 13 km S. of Jabiru (CBM); Tindal (ANIC); Fogg Dam (CBM); Humpto Doo (CBM); West Alligator River (CBM); Mary River (CBM); Howard Springs (ANIC); Darwin (ANIC); Adelaide River (ANIC); 17 km E. of Willeroo (CBM). Western Australia: Drysdale River (ANIC); Carsons Escarpment (ANIC); Windjana Gorge (CBM); Ord River near Ivanhoe (CBM); 135 km N. of Hall's Creek (CBM).

Habits: At the margins of rivers, creeks, and pools. Flies also readily to light. So far collected in October to December, and in April and August.

Note: This common species, widely distributed over whole tropical Australia, was formerly known only from north Queensland. At most localities it occurs together with *E. bipustulatus* (Macleay).

Elaphropus buprestoides (Sloane, 1896) new combination

(Figs 6, 29, 50)

Sloane, 1896, p. 361 (*Tachys*); 1921, p. 197 (*Tachys*)

CSIKI 1929, p. 173 (*Tachys*)

Types (not seen): Syntypes in ANIC and SAM.

Type locality: Kings Sound, northwestern Australia.

Diagnosis

A large, elongate species, distinguished from *E. banksi* by larger size, obliterated 7th stria, and anterior macula not reaching base.

Description

Measurements: Length: 2.95–3.25 mm; width: 1.25–1.4 mm; ratio width/length of pronotum: 1.34–1.37; ratio length/width of elytra: 1.5–1.53.

Colour: Black, nitid. Elytra with two yellow maculae, anterior elongate, not attaining base, medially reaching to 6th stria. Posterior macula crescent-shaped, attaining 4th stria. Mouthparts, legs, and basal part of antenna yellow, terminal segments infusate. Last abdominal segments dark brown.

Head: Eyes large, elongate, though not much protruding laterally, nearly attaining apex of pronotum. Surface distinctly microreticulate. Antennae short, attaining base of pronotum, median segments c. as long as wide.

Pronotum: Rather convex, base slightly wider than apex. Apex sinuate, anterior angles produced. Sides regularly, but not strongly curved, sinuate near posterior angles. Base medially rather produced. Lateral channel deep, becoming very narrow to apex. prebasal transverse impression very conspicuous, not interrupted, densely punctate. Microsculpture fine, isodiametric, conspicuous.

Elytra: Elongate, parallel. Striae deeply impressed, intervals strongly convex. 1st to 6th striae nearly complete, but only 1st and 5th attaining base. 7th very short, sometimes distinct, sometimes superficial. 3rd to 7th striae successively shortened to apex. Basal border angulate, in connection with 5th stria. Microsculpture conspicuous, consisting of nearly isodiametric meshes.

Aedeagus (Fig. 29): Elongate, narrow, arcuate in front of apex. Apex rounded. Both parameres 3-setose.

Variation: Some variation noted in development of 7th stria, which is in some specimens nearly obliterated.

Distribution (fig. 50): Northeastern Queensland, northern parts of Northern Territory, and Western Australia south to at least to Carnarvon.

Material examined (130): Queensland: Mc Leod River, 18 km W. of Mt. Carbine (CBM). Northern Territory: 45 km SW. of Borooloola (ANIC); 80 km SW. of Borooloola (ANIC); West Alligator River (CBM); 17 km NE. of Willeroo (CBM). Western Australia: Ord River near Ivanhoe (CBM); Ord River, 105 km N. of Hall's Creek (CBM); Mary River, 115 km WSW. of Hall's Creek (CBM); Fitzroy Crossing (CBM); 75 km SE. of Derby (CBM); Windjana Gorge (CBM); 26 km E. of Napier Downs (CBM); 20 km N. of Carnarvon (CBM).

Habits: In sand of rivers and pools, flies readily to light. Material before me was collected in April, May, and from November to January.

Note: The species was originally described from Kings Sound, northwestern Australia. However, it is widespread in the whole tropical part of Australia.

bipustulatus-group

Diagnosis

A group of three species, characterized by the presence of at least 5 striae, distinct microsculpture on the whole surface, and basal border of elytra not in contact with 5th stria.

Elaphropus bipustulatus (Macleay, 1871), new combination (Figs 7, 30, 51)

Macleay, 1869–73 (1871), p. 116 (*Bembidion*)

SLOANE 1921, p. 201 (*Tachys*)

CSIKI 1929, p. 170 (*Tachys*)

Tachys froggatti Sloane, 1896, p. 357, 362

Types (not seen): Syntypes in ANIC, AMS, and SAM.

Type locality: Gayndah, southeastern Queensland.

Note: There was some confusion about this species, as SLOANE (1896) newly described it as *Tachys froggatti* and confounded it with another species, formerly wrongly identified by him as *Tachys bipustulatus* Macleay, but later (SLOANE 1921) correctly newly described as *Tachys solidus* Sloane.

Diagnosis

Easily distinguished within group by 6-striate and unimaculate elytra.

Description

Measurements: Length: 2.1–2.6 mm; width: 0.95–1.15 mm; ratio width/length of pronotum: 1.5–1.55; ratio length/width of elytra: 1.41–1.46.

Colour: Black, a small transverse preapical spot yellow, attaining 4th elytral stria. Mouthparts, legs, and anterior half of antennae yellow, terminal segments and penultimate segment of maxillary palpus infusate. Lower surface piceous.

Head: Frontal furrows short, eyes large, removed from apex of pronotum. Microsculpture distinct, isodiametric. Antennae rather short, attaining base of pronotum, median segments slightly longer than wide.

Pronotum: Wide, moderately convex, base considerably wider than apex. Anterior angles rounded, slightly produced, sides not much curved, slightly sinuate near right posterior angles. Base medially slightly produced. Lateral channel narrow. Prebasal transverse impression distinct, not interrupted, finely punctate. Posterior angles with a very short carina. Surface finely, isodiametrically microreticulate.

Elytra: Fairly convex, in middle nearly parallel. 6-striate, only 1st stria attaining base, 5th and 6th shortened at base, 2nd to 6th successively shortened at apex. Striae moderately impressed, intervals slightly convex. Basal border strongly incurved, slightly angulate. Microsculpture not very conspicuous, rather irregular and slightly transverse.

Aedeagus (Fig. 30): Rather high, dorsally angulate near apex. Apex wide, rounded. Left paramere 2-setose.

Variation: Considerable variation of size noted, small specimens tend to be more convex with more rounded elytra.

Distribution (Fig. 51): Whole Queensland, perhaps also northern New South Wales, northern and central Northern Territory, Western Australia south to at least Hamersley Range.

Material examined: About 8000 specimens from more than 90 localities throughout its range (see Fig. 51). Only some rather marginal localities are cited: Queensland: Stewart River near Pt. Stewart, Cape York Pa. (CBM); Eina-sleigh River, 65 km E. of Georgetown (CBM). Northern Territory: Emily Gap, 6 mi. E. of Alice Springs (ANIC). Western Australia: Hooley Creek, 68 km NW. of Wittenoom (CBM).

Habits: By far the most common and one of the most widely distributed *Tachyura* in Australia. In tropical areas of all northern states in nearly each sort of riparian habitates, as well on river banks, as on the borders of watering pools for cattle. In most places abundant and in company with other *Tachyura* species. Abundant in summer, but recorded also from nearly all months.

Elaphropus solidus (Sloane, 1921), new combination (Figs 8, 31, 52)

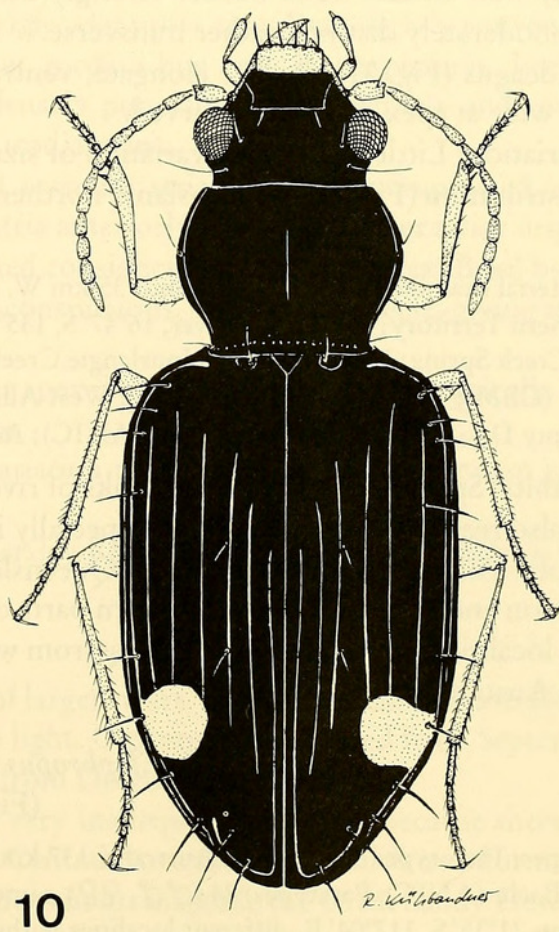
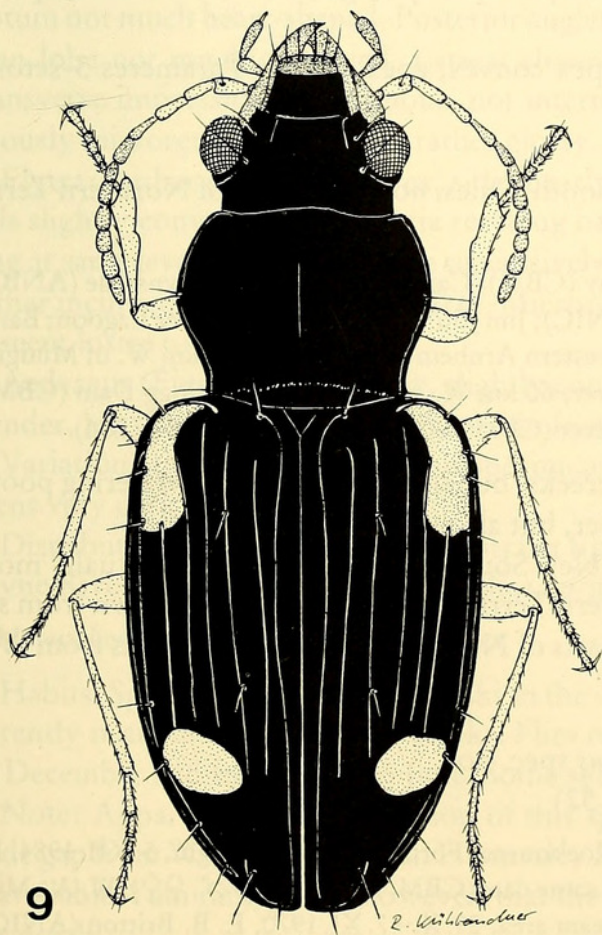
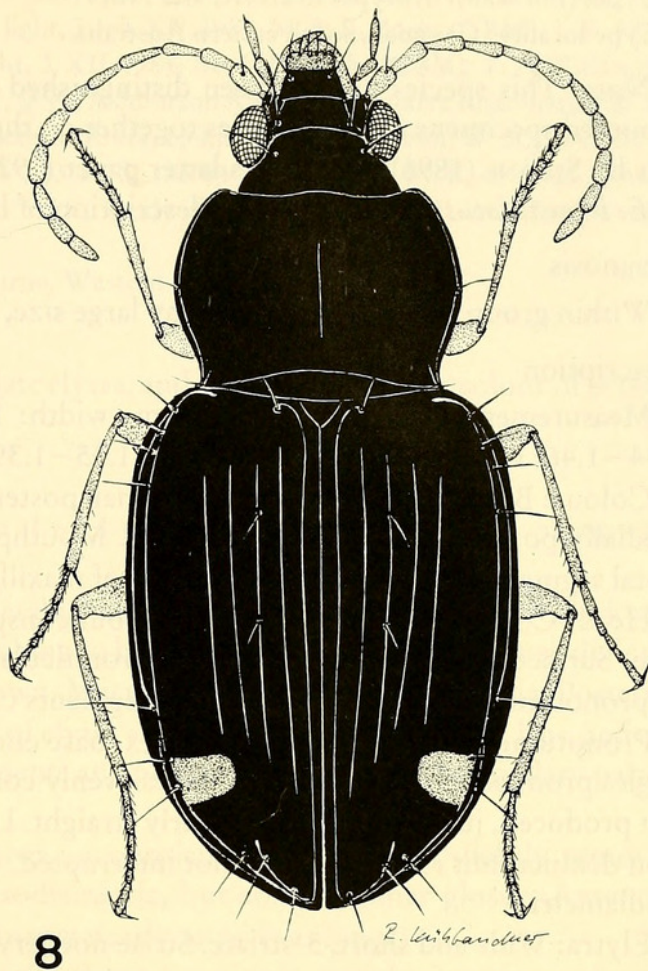
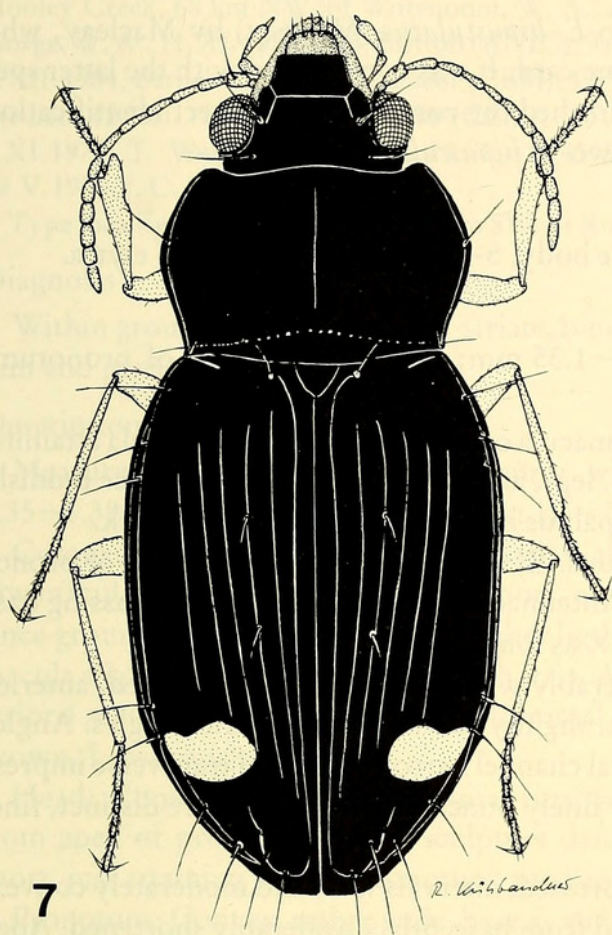
Sloane, 1921, p. 197, 201 (*Tachys*)

CSIKI 1929, p. 199 (*Tachys*)

Tachys bipustulatus Sloane, 1896, p. 357, 363 (not *bipustulatus* Macleay!)

Fig. 7–10: *Elaphropus*.

7. *E. bipustulatus* (Macleay), length: 2.4 mm; 8. *E. solidus* (Sloane), length: 3 mm; 9. *E. subopacus* spec. nov., length: 2.45 mm; 10. *E. bembidiformis* (Jordan), length: 3 mm.



Types (not seen): Syntypes in ANIC and NMV.

Type locality: Gayndah, south eastern Australia.

Note: This species has not been distinguished from *E. bipustulatus* (Macleay) by Macleay, who mounted specimens of both species together on the same card. It was confounded with the latter species by SLOANE (1896), who in his latter paper (1921) finished the confusion by correct identification of *E. bipustulatus* (Macleay) and redescription of his own *T. bipustulatus* as *T. solidus*.

Diagnosis

Within group easily distinguished by large size, wide body, 5-striate and unimaculate elytra.

Description

Measurements: Length: 2.7–3.1 mm; width: 1.15–1.35 mm; ratio width/length of pronotum: 1.44–1.46; ratio length/width of elytra: 1.35–1.39.

Colour: Black, slightly iridescent. A small posterior macula on elytra dark yellow. Macula attaining medially position of (shortened) 5th stria. Mouthparts, legs, and basal segments of antennae reddish, distal segments and penultimate segment of maxillary palpus infusate. Lower surface black.

Head: Convex, frontal furrows short, but conspicuous. Eyes large, removed from apex of pronotum. Surface finely, isodiametrically microreticulate. Antennae moderately elongate, surpassing base of pronotum by c. 1 segment. Median segments c. 1.5× as long as wide.

Pronotum: Wide, rather short, convex, base considerably wider than apex. Apex excised, anterior angles produced, widely rounded. Sides evenly convex, slightly sinuate near posterior angles. Angles not produced, just over 90°. Base nearly straight. Lateral channel narrow. Prebasal transverse impression distinct, but rather shallow, not interrupted, very finely punctate. Microsculpture distinct, fine, isodiametric.

Elytra: Wide and short, 5-striate. Striae not very impressed, intervals wide and moderately convex. 1st stria attaining base, 2nd to 5th striae largely removed from base, 5th considerably shortened. Apex largely non-striate. Basal border strongly incurved and perceptibly angulate, free. Microsculpture fine, moderately distinct, rather transverse.

Aedeagus (Fig. 31): Rather elongate, ventrally at apex convex, apex obtuse. Parameres 3-setose, right wide at apex, left rather curved.

Variation: Little, only some variation of size noted.

Distribution (Fig. 52): Queensland, northern New South Wales, northern parts of Northern Territory.

Material examined (113): Queensland: 35 km W. of Mackay (CBM); Cardstone (ANIC); Townsville (ANIC). Northern Territory: Mc Arthur River, 16°47' S, 135°45' E (ANIC); Jim Jim Creek; Wildman River Lagoon; Baroalba Creek Spring; Magela Creek; Nourlangie Creek, all in western Arnhem Land (ANIC); 3 km W. of Mudginberry (CBM); 13 km S. of Jabiru (CBM); West Alligator River, 60 km W. of Jabiru (CBM); Fogg Dam (CBM); Humpty Doo (CBM); Howard Springs (ANIC); Adelaide River (CBM); 30 km S. of Pine Creek (CBM).

Habits: Species living on sandy banks of rivers and creeks, but also on the banks of watering pools, flies also readily to light. Captured especially in summer, but also in most other months.

Note: Formerly known only from Queensland and New South Wales, this species is actually more common and abundant in the northern parts of Northern Territory, where it is now known from several localities. Apparently it is lacking from western parts of Northern Territory as well as from Western Australia.

Elaphropus subopacus spec. nov.

(Figs 9, 32, 52)

Types: Holotype: ♂, Western Australia, 137 km SW. of Roebourne, Fortescue River, at light, 5. XII. 1984, M. & B. Baehr (ANIC). Paratypes: 24 (♂♂, ♀♀), same locality, same date (CBM, ZSM); 52 (♂♂, ♀♀), W. A., Millstream, 21°35' S, 117°04' E, different localities within Millstream area, 29. X. – 7. XI. 1970, E. B. Britton (ANIC);

3 km N by W of Millstream HS, 21°34' S, 117°03' E, 11.–22.IV.1971, Upton & Mitchell (ANIC); 2♂♂, 1♀, 10 km E. of Millstream, W. A. bed of Fortescue River, at light, 3.–5.XII.1984, M. & B. Baehr (CBM); 1♂, 4♀♀, Hooley Creek, 68 km NW. of Wittenoom, W. A., at light, 3.XII.1984, M. & B. Baehr (CBM); 1♂, Wittenoom Gorge, W. A., 11.XI.1970, E. B. Britton (ANIC); 9 (♂♂, ♀♀), Ashburton River at Nanutarra Roadhouse, W. A., 6.XII.1984, Barber trap, M. & B. Baehr (CBM); 1♀, Gascoyne River, 15 km N. of Carnarvon, W. A., in sandy river bed, 12.XII.1984, M. & B. Baehr (CBM); 1♂, N. T., 23°37' S, 133°54' E, 10 km N. by E. of Alice Springs, 6.XI.1979, T. Weir (ANIC); 1♂, N. T., 23°45' S, 133°57' E, Emily Gap, 6 km SE. by E. of Alice Springs, 19.V.1978, J. C. Cardale (ANIC).

Type locality: Fortescue River, 137 km SW. of Roebourne, Western Australia.

Diagnosis

Within group characterized by 6-striate, bimaculate elytra, and by slightly metallic colour of pronotum and piceous elytra.

Description

Measurements: Length: 2.4–2.65 mm; width: 1–1.1 mm; ratio width/length of pronotum: 1.35–1.39; ratio length/width of elytra: 1.5–1.54.

Colour: Head and pronotum black with slight metallic tinge, elytra dark piceous with two dark yellow maculae. Anterior macula rather short, not reaching to base, but anterior border not well defined, since ground colour at shoulder is a rather light brown. Macula medially attaching 5th stria. Posterior macula slightly transverse, attaining 4th stria. Apex of elytra slightly lighter. Mouthparts, legs, and anterior 4 segments of antennae yellow, terminal segments and penultimate segment of maxillary palpus brown. Lower surface brown.

Head: Convex, rather wide, frontal furrows short, inconspicuous. Eyes large, slightly removed from apex of pronotum. Microsculpture dense, isodiametric, but surface rather glossy. Antennae short, just attaining base of pronotum, median segments nearly as wide as long.

Pronotum: Convex, rather wide, base as wide as apex. Apex completely straight, anterior angles not produced, widely rounded. Sides not much curved, barely sinuate near posterior angles. Hence, pronotum not much heart-shaped. Posterior angles nearly right, not projecting. Base slightly convex, median lobe not much produced. Lateral channel narrow, median line very inconspicuous. Prebasal transverse impression conspicuous, not interrupted, densely punctate. Surface densely and conspicuously microreticulate, though rather glossy. Meshes isodiametric.

Elytra: Rather elongate, convex, sides nearly parallel. 6-striate, striae moderately impressed, intervals slightly convex. Only 1st stria reaching base. 6th stria anteriorly shortened, other striae originating at same level. 2nd to 6th striae successively shortened considerably in front of apex. Basal border rather incurved, but not angulate, free. Microsculpture conspicuous, slightly transverse, giving an iridescent lustre to surface.

Aedeagus (Fig. 32): Rather low, slightly concave near apex. Parameres 3-setose, right apically very slender, left characteristically thickened in front of apex.

Variation: In Western Australian specimens little variation noted, two Central Australian specimens very dark.

Distribution (Fig. 52): Western Australia from Hamersley Range (Fortescue River) to at least Gascoyne River; Central Australia near Alice Springs.

Material examined (101): Only type series.

Habits: Species living on sandy banks in the vicinity of larger rivers, though in Central Australia apparently near small intermittent creeks. Flies readily to light. Captures are recorded from September to December and from April to June. Some specimens from December are teneral.

Note: Apparently the distribution of this species is very inadequately known, because there is a wide gap from Western Australian Hamersley Range to Central Australia, from which no information is available. I am rather sure, however, that the species does not transgrade the Great Sandy Desert to the north.

Diagnosis

A group of four species characterized by smooth, very glossy surface, black colour, at least 5-striate, unimaculate or bimaculate elytra with 1st stria not reaching to base.

Elaphropus bembidiiformis (Jordan, 1894), new combination
(Figs 10, 33, 53)

Jordan, 1894, p. 111 (*Tachys*)

ANDREWES 1925, p. 402, 422 (*Tachys*)

CSIKI 1929, p. 196 (*Tachys*)

DARLINGTON 1962, p. 464 (*Tachys*)

Tachys helmsi Sloane, 1898, p. 476; 1921, p. 202 (*Tachys*)

Types (not seen): Of *bembidiiformis*: Syntypes in MNHN; of *helmsi*: Syntypes in ANIC and SAM.

Type locality: of *bembidiiformis*: Tenimber; of *helmsi*: Upper Ord River, Western Australia.

Note: Synonymy stated by ANDREWES (1925) and DARLINGTON (1962). Australian and Asian specimens compared by me are identical.

Diagnosis

Easily distinguished within group by 6-striate and unimaculate elytra, and by strongly heart-shaped pronotum.

Description

Measurements: Length: 2.4–3.1 mm; width: 1.1–1.4 mm; ratio width/length of pronotum: 1.34–1.39; ratio length/width of elytra: 1.4–1.43.

Colour: Black, with a metallic lustre, a circular posterior elytral spot yellow, macula medially attaining 3rd stria. Mouthparts, antennae, and legs light yellow, knees slightly infusate. Ventral surface brown.

Head: Convex, frontal furrows short, curved. Eyes large, laterally strongly protruding. Head in front of eyes elongate, especially with regard to labrum. Surface very glossy. Antennae moderately elongate, surpassing base of pronotum by c. 1.5 segments. Median segments c. 1.5× as long as wide.

Pronotum: Very convex, strongly heart-shaped, base slightly narrower than apex. Apex straight, anterior angles rounded, not produced. Sides strongly curved, sinuate near posterior angles. Angles nearly right. Base slightly convex. Lateral channel deep, wide in middle. Median line not visible, prebasal transverse impression deep, not interrupted, extremely densely and finely punctate. Surface very glossy.

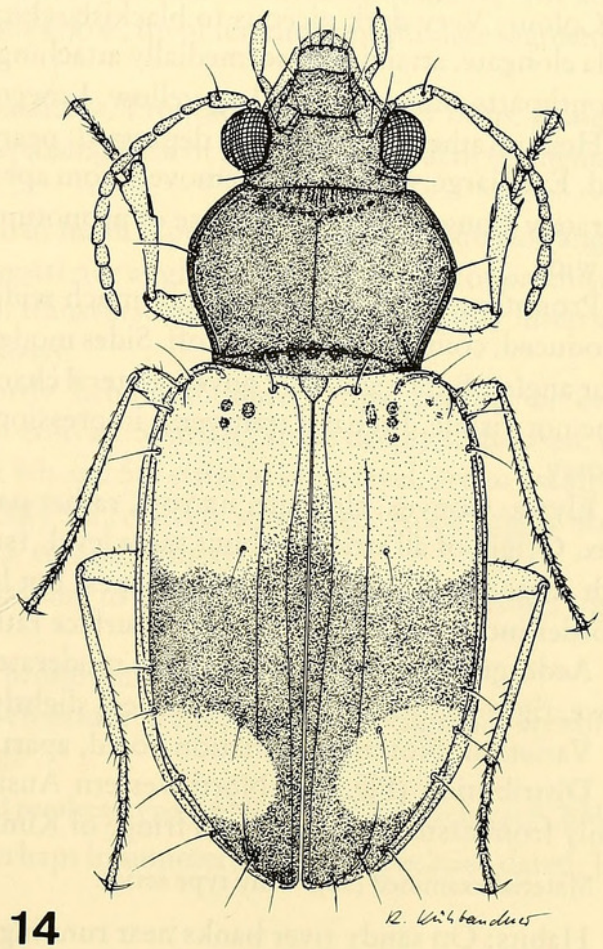
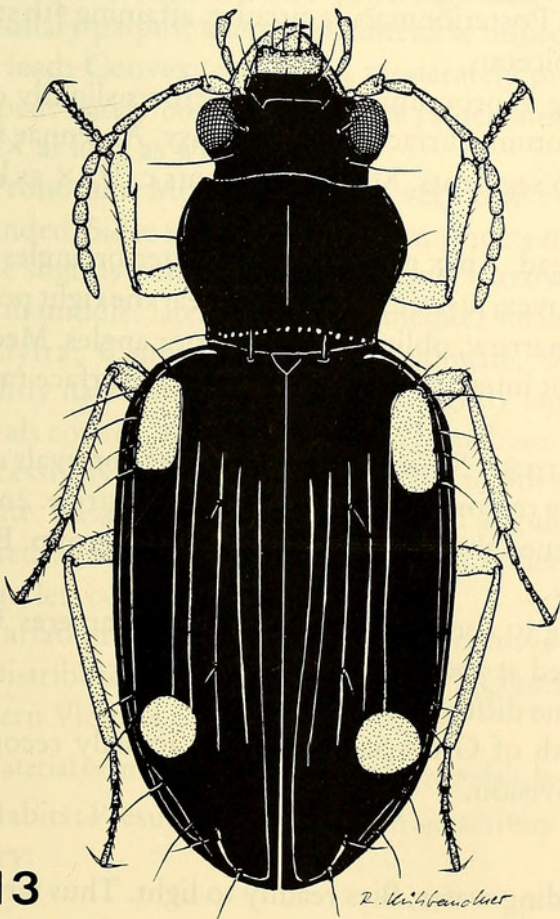
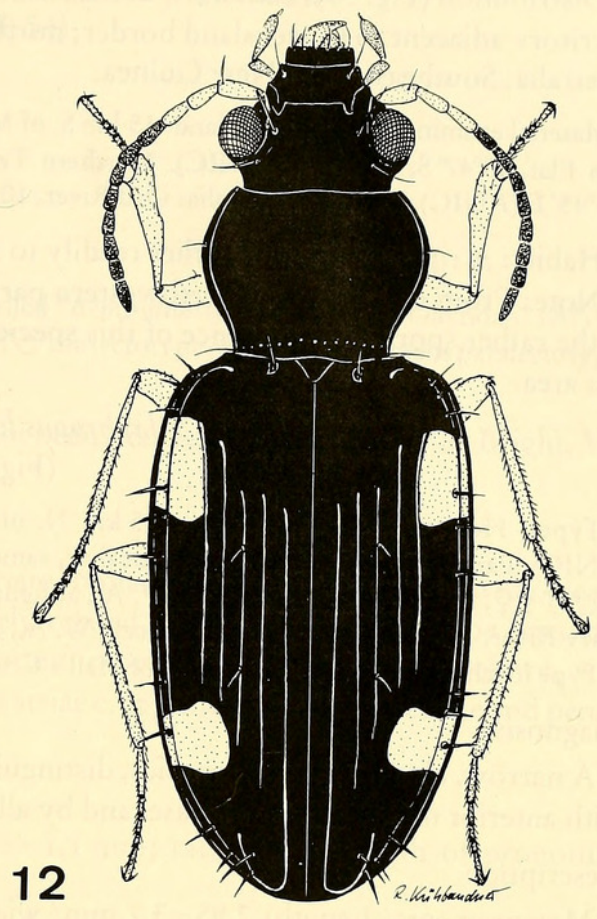
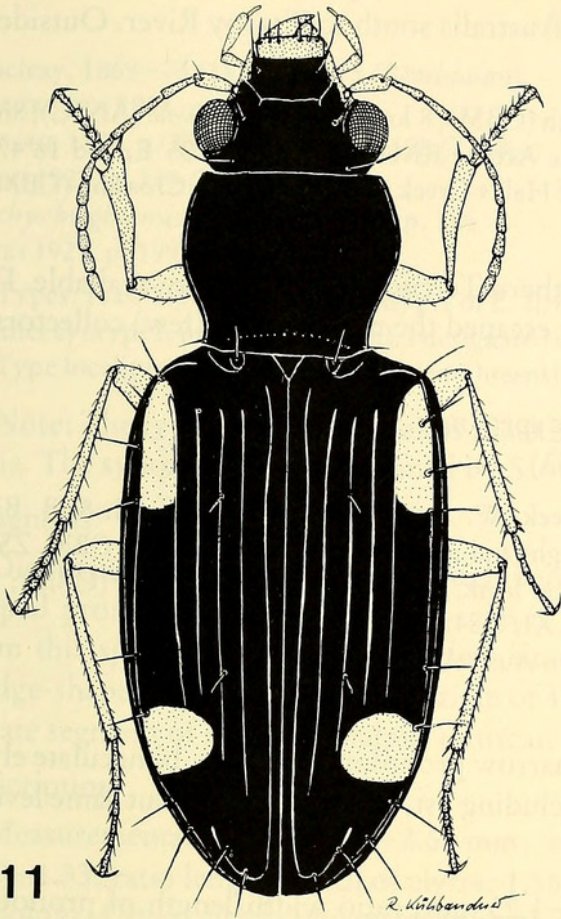
Elytra: Wide and short, very convex, considerably and contrastingly wider than base of pronotum, 6-striate. Striae deeply impressed, intervals strongly convex. No stria attaining base, origin of 1st to 5th striae successively approaching base, 1st stria originating at about 1st third of elytra. 6th stria slightly more removed from base. 2nd to 6th striae successively shortened at apex, apex widely smooth. Base incurved, though not angulate, free. Surface very glossy.

Aedeagus (Fig. 33): Rather thick, ventral side straight. Both parameres 3-setose, left with slightly thickened apex, right very stout.

Variation: Considerable variation of size noted. Larger specimens tend to have a slightly wider pronotum.

Fig. 11–14: *Elaphropus*.

11. *E. leptothorax* spec. nov., length: 3.1 mm; 12. *E. striolatus* (Macleay), length: 2.55 mm; 13. *E. ordensis* spec. nov., length: 2.7 mm; 14. *E. flavicornis* (Sloane), length: 2.35 mm.



Distribution (Fig. 53): Eastern Queensland, south to about Rockhampton; northeastern Northern Territory adjacent to Queensland border; northwestern Australia south to Fitzroy River. Outside of Australia: Southeast Asia, New Guinea.

Material examined (21): Queensland: 15 km S. of Marlborough (CBM); 8 km W. of Gordonvale (ANIC); Ship-ton Flat, 15°47' S, 145°14' E (ANIC). Northern Territory: Mc Arthur River, 16°27' S, 136°05' E, and 16°47' S, 135°45' E (ANIC). Western Australia: Ord River, 105 km N. of Hall's Creek (CBM); Fitzroy Crossing (CBM).

Habits: A ripicolous species, flies readily to light.

Note: From northern and northwestern parts of Northern Territory no records are available. Due to the rather sporadic occurrence of this species it likely escaped the notice of the (few) collectors in this area.

Elaphropus leptothorax spec. nov.
(Figs 11, 34, 53)

Types: Holotype: ♂, Ord River, 105 km N. of Hall's Creek, W. A., at light, 15.XI.1984, M. & B. Baehr (ANIC). Paratypes: 20 ♂♂ ♀♀, same locality, same date, at light and in sandy river bank (ANIC, CBM, ZSM); 16 ♂♂ ♀♀, Ord River near Ivanhoe, W. A., at light and on river bank, 13.XI.1984, M. & B. Baehr (CBM); 1 ♂, Mary River, 115 km WSW. of Hall's Creek, W. A., at light, 17.XI.1984, M. & B. Baehr (CBM).

Type locality: Ord River 105 km N. of Hall's Creek, Western Australia.

Diagnosis

A narrow, elongate, glossy species, distinguished by narrow pronotum, 5-striate, bimaculate elytra with anterior macula attaining base, and by all striae, including 1st, originating at about same level.

Description

Measurements: Length: 2.95–3.2 mm; width: 1.15–1.25 mm; ratio width/length of pronotum: 1.23–1.26; ratio length/width of elytra: 1.53–1.57.

Colour: Very dark piceous to blackish, elytra slightly lighter, two maculae reddish. Anterior macula elongate, attaining base, medially attaching 5th stria. Posterior macula circular, attaining 4th stria. Mouthparts, antennae, and legs yellow. Lower surface piceous.

Head: Rather wide, slightly depressed, nearly as wide as pronotum. Frontal furrows slightly curved. Eyes large, protruding, removed from apex of pronotum. Surface smooth, glossy. Antennae moderately elongate, surpassing base of pronotum by c. 1.5 segments. Median segments c. $1\frac{1}{3}\times$ as long as wide.

Pronotum: Convex, narrow, not much wider than head. Apex nearly straight, anterior angles not produced, completely rounded off. Sides moderately convex, just slightly sinuate near the right posterior angles. Base regularly convex. Lateral channel very narrow, obliterated at anterior angles. Median line not visible. Prebasal transverse impression deep, not interrupted, finely punctate. Surface rather glossy.

Elytra: Convex, elongate, narrow, rather parallel, 5-striate. Striae deeply impressed, intervals convex. Origin of all striae at about same level, 1st not more removed from base than other striae. 2nd to 5th striae successively shortened at apex, but less shortened than in other species of this group. Basal border incurved, but not angulate. Surface rather glossy.

Aedeagus (Fig. 34): Rather short, moderately sloping to apex, apex obtuse. Both parameres 3-setose, right apically slender, left curved, slightly thickened at apex.

Variation: Not much variation noted, apart from some differences of size.

Distribution (Fig. 53): Northwestern Australia north of Great Sandy Desert, actually recorded only from eastern and southern fringe of Kimberley Division.

Material examined (38): Only type series.

Habits: On sandy river banks near running and standing water, flies readily to light. Thus far captured in November.

Elaphropus striolatus (Macleay, 1871), new combination
(Figs 12, 35, 54)

Macleay, 1869–73 (1871), p. 115 (*Bembidion*)

BLACKBURN 1894, p. 139 (*Tachys*)

SLOANE 1896, p. 357, 363; 1921, p. 198 (*Tachys*)

CSIKI 1929, p. 199 (*Tachys*)

Tachys brightensis Blackburn, 1891, p. 785

CSIKI 1929, p. 199 (*Tachys*)

Types: I saw 2♂♂ and 4♀♀ syntypes of *E. striolatus*, labelled "*Bembidion striolatum* MacI, Gayndah" (ANIC), 1 other syntype is in AMS (not seen). I designated one of the ♂♂ the lectotype, the other specimens paralectotypes. Type locality: Gayndah, southeastern Queensland.

Note: The type(s) of *T. brightensis* Blackburn has not been examined. Type locality is: Bright, Victoria. The synonymy was confirmed by SLOANE (1896).

Diagnosis

Distinguished by fairly wide, though parallel, 5-striate, bimaculate elytra and rather wide, heart-shaped pronotum. However, the species is very closely related to *E. ordensis* and can be separated from this species by its narrower, less sinuate pronotum, more parallel and elongate elytra, with wedge-shaped, not rounded apex, origin of 4th and 5th striae c. at same level, and antennae and penultimate segment of maxillary palpus infusate.

Description

Measurements: Length: 2.5–2.65 mm; width: 1.05–1.1 mm; ratio width/length of pronotum: 1.29–1.33; ratio length/width of elytra: 1.55.

Colour: Glossy black, two maculae on elytra yellow. Anterior macula rather circular, well defined, not attaining base, medially attaching 5th stria. Posterior macula transverse, attaining 4th stria. Mouthparts, legs, and three basal segments of antennae yellow, tip of femora, penultimate segment of maxillary palpus, and rest of antennae infusate.

Head: Convex, eyes large, moderately projecting laterally. Frontal furrows rather deep, straight, clypeus barely convex. Antennae rather short, just surpassing base of pronotum. Median segments c. $1\frac{1}{3}\times$ as long as wide.

Pronotum: Moderately wide, very convex, wider than head. Apex faintly excised, anterior angles rounded. Sides moderately convex, sinuate near right posterior angles. Angles laterally not produced. Base slightly convex. Lateral channel narrow. Prebasal transverse impression deep, slightly interrupted in middle, laterally finely punctate. Surface very glossy.

Elytra: Convex, moderately elongate, widest shortly behind shoulders, then parallel or even slightly narrowed. Apex rather straightly tapering, not convex. 5-striate, striae deeply impressed, intervals convex. All striae removed from base. Origin of 4th and 5th striae at same level, 3rd to 1st striae successively removed from base. 2nd to 5th striae apically successively shortened. Apex largely non-striate. Basal border incurved, but not angulate. Surface smooth, glossy.

Aedeagus (Fig. 35): Short and high, rather steeply sloping to apex. Both parameres 3-setose, right stout, left curved near apex.

Variation: Only some variation of relative width of pronotum noted.

Distribution (Fig. 54): Southeastern Queensland, New South Wales, Australian Capital Territory, eastern Victoria.

Material examined (7): Queensland: Gayndah, lectotype and paralectotypes (ANIC). A.C.T.: Canberra (CBM).

Habits: Presumably riparian. Main activity period perhaps in summer, only one specimen dated: January.

Elaphropus ordensis spec. nov.

(Figs 13, 36, 54)

Types: Holotype: ♂, Ord River near Ivanhoe, W. A., at light, 13. XI. 1984, M. & B. Baehr (ANIC). Paratypes: 16 ♂♂ ♀♀, same locality, same date, at light and in sandy river bank (ANIC, CBM, ZSM); 1 ♂, Ord River, 105 km N. of Hall's Creek, W. A., at light, 15. XI. 1984, M. & B. Baehr (CBM).

Type locality: Ord River near Ivanhoe, northwestern Australia.

Diagnosis

Convex, 5-striate, bimaculate species with glossy surface. Distinguished from very similar *E. striolatus* by pronotum wider, laterally more convex and more sinuate near posterior angles, by elytra shorter, wider, laterally more convex, apically regularly rounded, by 4th and 5th striae not originating at same level, and by antennae and maxillary palpus barely infuscate.

Description

Measurements: Length: 2.65–2.85 mm; width: 1.15–1.2 mm; ratio width/length of pronotum: 1.31–1.35; ratio length/width of elytra: 1.47–1.49.

Colour: Glossy black, two elytral maculae yellow. Anterior macula short, not attaining base, medially attaching 5th stria. Posterior macula circular to slightly transverse, attaching 4th stria. Mouthparts, antennae, and legs yellow, penultimate segment of maxillary palpus and terminal segments of antennae not or very slightly infuscate. Lower surface black.

Head: Convex, much narrower than pronotum. Frontal furrows slightly curved. Eyes large, moderately protruding, removed from apex of pronotum. Surface smooth, glossy. Antennae rather elongate, surpassing base of pronotum by c. 2 segments. Median segments c. 1.5× as long as wide.

Pronotum: Wide, convex, much wider than head. Apex slightly excised, anterior angles rounded, slightly produced. Sides convex, fairly sinuate near the right posterior angles. Base slightly produced in middle. Lateral channel deep, fairly wide. Median line obsolete. Prebasal transverse impression deep, not interrupted, finely punctate. Surface very glossy.

Elytra: Fairly wide, laterally rather convex. Apex regularly rounded, 5-striate. Striae deeply impressed, intervals fairly convex. Striae from 5th successively removed from base, no stria attaining base. 4th and 5th striae not originating at same level. 2nd to 5th striae at apex successively shortened, apex widely smooth. Basal border somewhat incurved, not angulate. Surface glossy.

Aedeagus (Fig. 36): Rather low, ventral side slightly sinuate, apex obtuse. Both parameres 3-setose, left rather curved at apex, right stout.

Variation: Little variation noted.

Distribution (Fig. 54): Northwestern Australia north of Great Sandy Desert, actually thus far recorded only from Ord River.

Material examined (18): Only type series.

Habits: Found near pools on sandy banks of larger rivers, flies readily to light. So far collected in November, some specimens teneral.

flavicornis-group

Diagnosis

A group of two species, characterized by glossy surface, bistriate, bimaculate elytra, and normal posterior angles of pronotum.

Elaphropus flavicornis (Sloane, 1921), new combination
(Figs 14, 37, 55)

Sloane, 1921, p. 202 (*Tachys*)

CSIKI 1929, p. 179 (*Tachys*)

Types (not seen): Syntypes in Sloane Coll. (ANIC) and in NMV.

Type locality: Laura River near Cooktown, northeastern Queensland.

Diagnosis

A small, reddish to light brown species, with large, ill defined elytral maculae, the anterior occupying nearly the anterior half of elytra medially to 2nd stria.

Description

Measurements: Length: 2.25–2.45 mm; width: 1–1.08 mm; ratio width/length of pronotum: 1.35–1.38; ratio length/width of elytra: 1.49–1.52.

Colour: Reddish to light brown, two large, ill defined maculae on elytra yellowish. Anterior macula very large, occupying nearly the anterior half of elytra, medially attaining 2nd stria. Posterior macula large, c. square, medially slightly surpassing 2nd stria. Mouthparts, legs, and antennae yellow. Lower surface light reddish.

Head: Convex, rather wide, Eyes large, laterally rather protruding, removed from apex of pronotum. Surface smooth, glossy. Antennae short, just surpassing base of pronotum. Median segments c. $1\frac{1}{3}\times$ as long as wide.

Pronotum: Convex, wide, base as wide as apex. Apex straight, anterior angles not produced, rounded. Sides strongly convex, slightly sinuate near posterior angles. Angles c. 100° , not projecting. Base slightly convex. Prebasal transverse impression distinct, but not strongly impressed, interrupted in middle, at this place with a deep pore, laterally not perceptibly punctate. Surface glossy.

Elytra: Convex, rather wide. Sides regularly curved, bistrate. Striae superficially impressed, slightly punctate, intervals slightly convex. 2nd stria basally and apically shortened. 1st stria obliterated at base. Basal border slightly incurved, not angulate, ending in a hook-shaped pore. Surface glossy.

Aedeagus (Fig. 37): Elongate, low. Apex slightly upturned. Both parameres 2-setose, left slender and elongate, apically curved, right paramere wide, robust.

Variation: In some specimens traces of outer striae by high magnification visible as fine punctures. In eastern specimens anterior macula slightly better defined, pattern more contrasting.

Distribution (Fig. 55): Northeastern Queensland south to about Ingham; northern parts of Northern Territory; northwestern Australia south at least to Hamersley Range.

Material examined (ca. 700): Specimens from about 30 localities examined (see Fig. 55). In Western Australia most southerly locality is Millstream at Fortescue River.

Habits: Ripicolous on sandy banks of rivers, but also at watering pools, flies readily to light, apparently over fairly wide distances. Most abundant in summer, but collected in most other months.

Note: A northern species, formerly known only from northern Queensland, actually distributed over the whole of tropical northern Australia. It is perhaps more common in northern and northwestern Australia than in northern Queensland.

Elaphropus brittoni spec. nov.
(Figs. 15, 38, 55)

Types: Holotype: ♂, $12^\circ 52' S$, $132^\circ 47' E$, Nourlangie Creek, 8 km E. of Mt. Cahill, N. T., 27.X.1972, at light, E. B. Britton (ANIC). Paratypes: 17 ♂♂ ♀♀, same locality, same date (ANIC, CBM); 4 ♂♂ ♀♀, $12^\circ 31' S$, $132^\circ 54' E$, 9 km N. by E. of Mudginbarry HS, N. T., 30.X.1972, at light, E. B. Britton (ANIC); 1 ♂, same locality, 26.V.1973, E. G. Matthews (ANIC); 4 ♂♂ ♀♀, $12^\circ 47' S$, $132^\circ 51' E$, Baroalba Creek Springs, N. T., 19 km NE. by E. of Mt. Cahill, 28.X.1972, at light, E. Britton (ANIC); 1 ♀, same locality, 16.XI.1972, M. S. Upton (ANIC);

2♂♂, 12°52'S, 132°50'E, Koongarra, 15 km E. of Mt. Cahill, N. T., 15. XI. 1972, M. S. Upton (ANIC); 8♂♂ ♀♀, 12°50'S, 132°51'E, 15 km E. by N. of Mt. Cahill, N. T., 29. X. 1972, at light, E. Britton (ANIC, CBM); 2♂♂, 1♀, 12°50'S, 132°52'E, 19 km E. by N. of Mt. Cahill, N. T., 18. XI. 1972, M. Upton (ANIC); 14♂♂ ♀♀, 12°17'S, 133°20'E, Cooper Creek, 11 km S. by W. of Nimbuwah Roack, N. T., 1. XI. 1972, at light, E. B. Britton (ANIC, CBM); 1♂, 1♀, 16°08'S, 136°06'E, 22 km WSW. of Borooloola, N. T., 2. XI. 1975, M. S. Upton (ANIC); 2♂♂, 1♀, 16°28'S, 136°09'E, 46 km SSW. of Borooloola, N. T., 23. IV. 1976, J. E. Feehan (ANIC); 1♂, 1♀, 16°40'S, 135°41'E, Bessie Spring, 8 km ESE. of Cape Crawford, N. T., 12. IV. 1976, at light, J. E. Feehan (ANIC); 1♂, 10 km W. of Roadside Inn, 75 km E. of Timber Creek, N. T., 9. XI. 1984, at light, M. & B. Baehr (CBM).

Type locality: Nourlangie Creek, Arnhem Land, Northern Territory.

Diagnosis

Very small species, distinguished from related *E. flavicornis* by much darker colour, smaller, well defined maculae, with anterior macula being much shorter and attaining at best position of 3rd stria, and by wider, less heart-shaped pronotum.

Description

Measurements: Length: 2–2.25 mm; width: 0.85–0.9 mm; ratio width/length of pronotum: 1.38–1.4; ratio length/width of elytra: 1.5–1.51.

Colour: Piceous, two maculae on elytra contrastingly yellow. Anterior macula attaining shoulder, elongate, medially attaining at best position of 3rd stria, normally 4th stria. Posterior macula very distinct, well defined, c. circular, medially attaining 2nd stria. Between anterior and posterior maculae a space about as long as anterior macula. Most of elytra dark. Mouthparts, legs, and antennae yellow. Ventral surface brown.

Head: Convex, frontal furrows short, slightly convergent. Eyes very large, strongly protruding, only slightly removed from apex of pronotum. Surface glossy. Antennae short, surpassing base of pronotum by c. one segment. Median segments nearly as wide as long.

Pronotum: Rather wide, convex. Base as wide as apex. Apex nearly straight, anterior angles not produced, rounded. Sides fairly convex, slightly sinuate near posterior angles. Base slightly convex. Lateral channel moderately wide. Median line obsolete. Prebasal transverse impression distinct, interrupted and with a pore in middle, laterally very finely, inconspicuously punctate.

Elytra: Rather wide, sides slightly convex, bistriate. Striae moderately impressed, intervals fairly depressed. 1st stria attaining apex and base, 2nd shortened. Surface glossy. Basal border slightly incurved, not angulate.

Aedeagus (Fig. 38): Rather short and low. Near apex slightly concave, apex obtuse, not upturned. Both parameres 2-setose, left rather wide, narrowed just before apex, right stout.

Variation: Apart from some variation of size not noted.

Distribution (Fig. 55): Northern part of Northern Territory.

Material examined (63): Only type series.

Habits: Apparently riparian, flies easily to light. So far collected in October, November, April, and May.

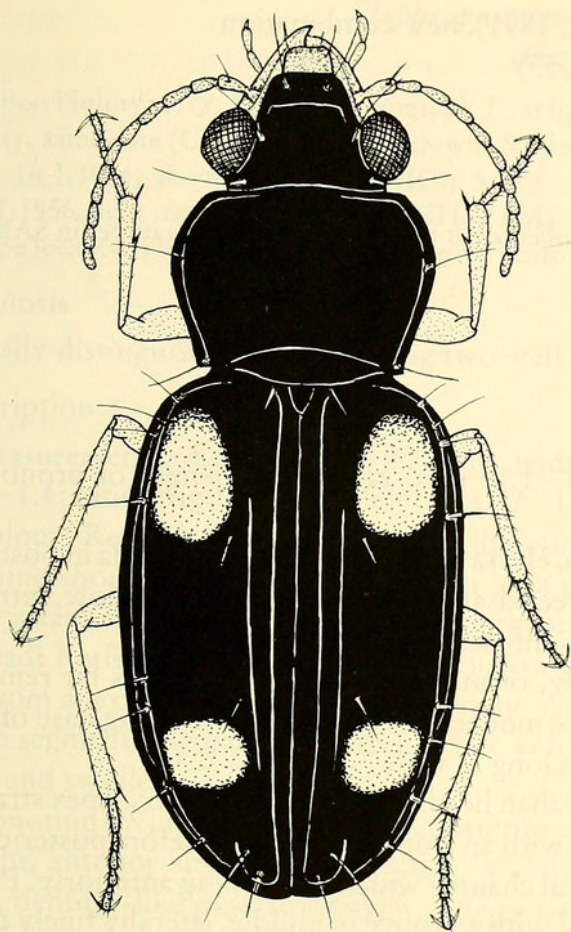
ovensensis-group

Diagnosis

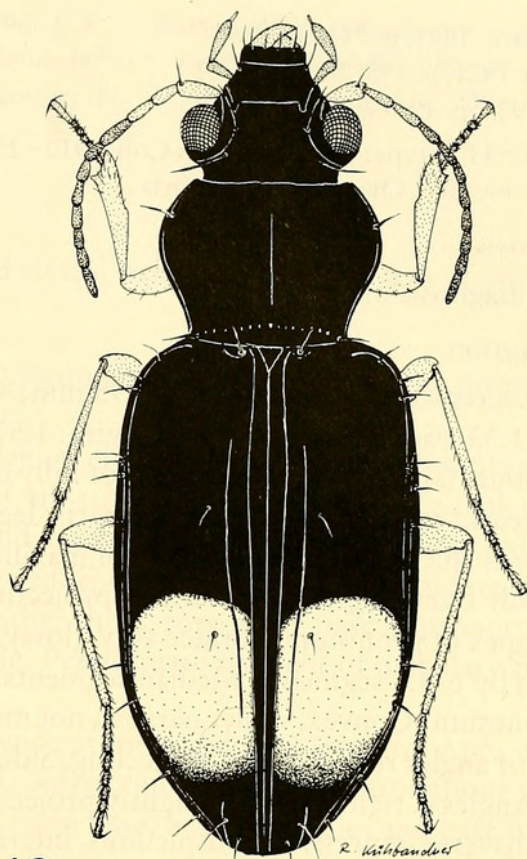
A single, remarkable, bistriate, glossy species, characterized by a single large posterior macula on elytra.

Fig. 15–18.: *Elaphropus*.

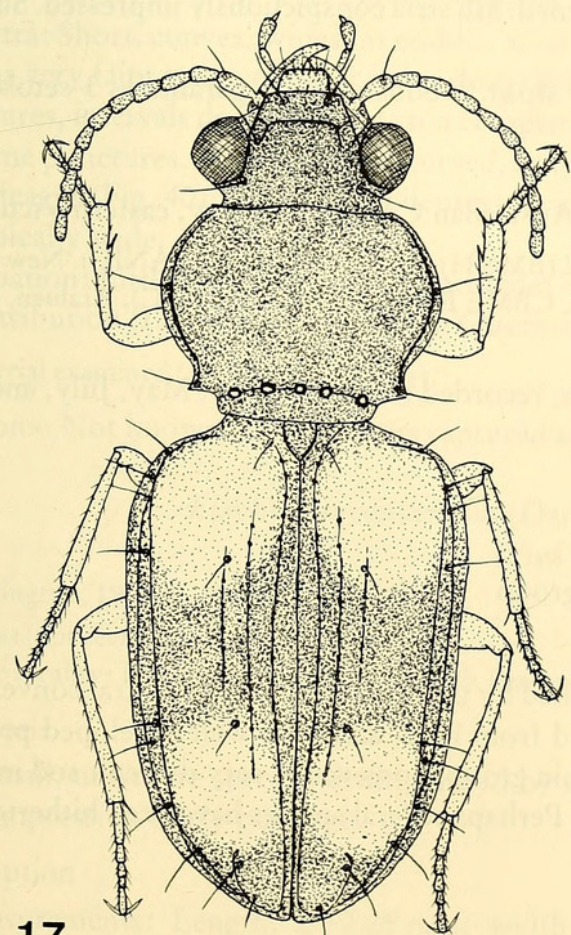
15. *E. brittoni* spec. nov., length: 2.1 mm; 16. *E. ovensensis* (Blackburn), length: 2.8 mm; 17. *E. pseudoconvexus* spec. nov., length: 2.1 mm; 18. *E. convexus* (Darlington), length: 2.1 mm.



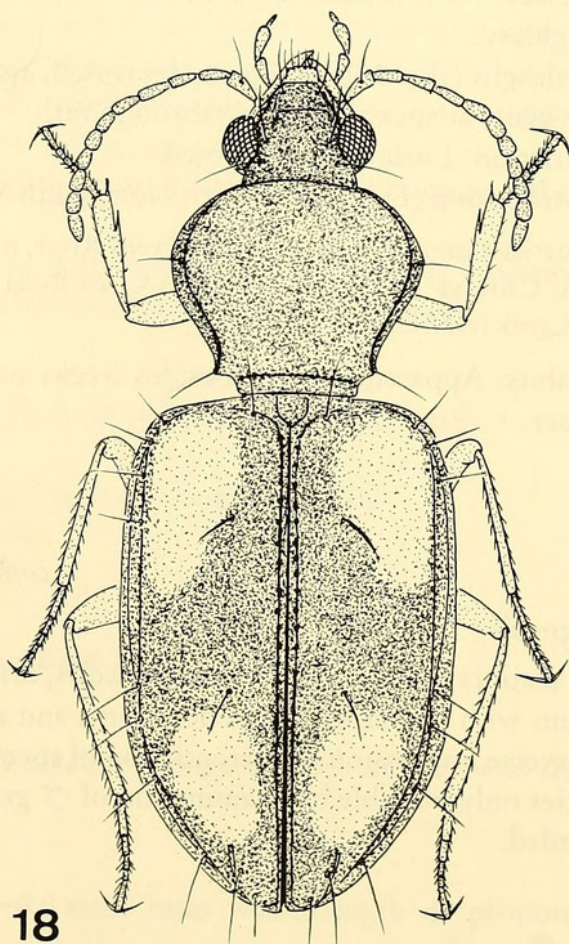
15



16



17



18

Elaphropus ovensensis (Blackburn, 1891), new combination
(Figs 16, 39, 55)

Blackburn, 1891, p. 784 (*Tachys*)

SLOANE 1921, p. 198, 202 (*Tachys*)

CSIKI 1929, p. 191 (*Tachys*)

Types: Holotype: ♀, "Blackburn Coll. 1910–236, *Tachys ovensensis* Blackb" (BMNH), paratypes in SAM.

Type locality: Ovens River, Victoria.

Diagnosis

See diagnosis of group.

Description

Measurements: Length: 2.75–2.95 mm; width: 1.1–1.15 mm; ratio width/length of pronotum: 1.31–1.33; ratio length: width of elytra: 1.57–1.6.

Colour: Glossy black (holotype not fully coloured!), elytra with a large reddish macula in posterior half, nearly attaining suture. Mouthparts, legs, and three basal segments of antennae yellow, terminal segments and penultimate segment of maxillary palpus infusate. Lower surface brown.

Head: Eyes large, but not much projecting laterally, orbits rather large, hence eyes far removed from apex of pronotum. Surface very glossy. Antennae moderately elongate, surpassing base of pronotum by c. 1.5 segments. Median segments c. 1.5× as long as wide.

Pronotum: Convex, rather narrow, not much wider than head. Base as wide as apex. Apex straight, anterior angles rounded, not projecting. Sides convex, with an elongate sinuosity before posterior angles. Angles c. right, laterally slightly projecting. Lateral channel wide, obliterating anteriorly. Prebasal transverse impression conspicuous, interrupted and with a groove in middle, laterally finely punctate. Median line completely absent. Surface glossy.

Elytra: Elongate, parallel, shoulders prominent. Bistriate. Striae well impressed, but intervals rather depressed. 1st stria attaining apex and base, 2nd shortened. 8th stria conspicuously impressed. Surface very glossy.

Aedeagus (Fig. 39): Elongate, depressed, apex very stout, produced. Both parameres 3-setose, left wide, acute at apex. right wide throughout.

Variation: Little variation noted.

Distribution (Fig. 55): Eastern New South Wales, Australian Capital Territory, eastern Victoria.

Material examined (10): Victoria: Ovens River, holotype! (BMNH), A. C. T.: Canberra (ANIC). New South Wales: Cabbage Tree Creek, Canberra Coast Road (ANIC, CBM); Eucumbene River (ANIC); Araluen, Apple Tree Creek (ANIC).

Habits: Apparently living besides creeks and rivers, recorded from February, May, July, and December.

convexus-group

Diagnosis

A distinct group of 5 bimaculate species, distinguished by tristriate to unistriate elytra, convex pronotum with posterior angles dentiform and removed from base, and by a well developed prebasal transverse impression. Differentiation of species within group, however, is very difficult and in some species only possible by examination of ♂ genitalia. Perhaps several species have been hitherto confounded.

Elaphropus pseudoconvexulus spec. nov.

(Figs. 17, 40, 56)

Types: Holotype: ♂, Howard Springs, N. T., at light, 27. I. 1968, J. A. C. Watson (ANIC). Paratypes: 1 ♂, same locality, same date (CBM); 2 ♀♀, Lansdowne Station, Queensland, 19°40' S, 146°51' E, 7 km S. of Woodstock, at light, 16. I. 1974, R. A. Barrett (ANIC); 5 ♂♂, 3 ♀♀, Australia, N. Q., Kuranda, 200 m 11. III., 13. III., 14. III. 1956, light trap, J. L. Gressitt (BMH, CBM).

Type locality: Howard Springs, Northern Territory.

Diagnosis

Easily distinguished by possessing two well developed elytral striae and at least traces of 3rd stria.

Description

Measurements: Length: 2.1–2.2 mm; width: 0.9–0.95 mm; ratio width/length of pronotum: 1.38–1.4; ratio length/width of elytra: 1.42–1.44.

Colour: Reddish-brown, two rather ill defined maculae on elytra yellow. Anterior macula nearly attaining shoulder, medially attaining at least position of 4th stria. Posterior macula c. circular, medially attaining position of 3rd stria. Mouthparts, legs, and antennae yellow. Lower surface reddish.

Head: Rather wide, convex, frontal furrows short, curved. Eyes large, laterally protruding, removed from apex of pronotum. Surface glossy. Antennae rather short, surpassing base of pronotum by c. one segment. Median segments c. $1\frac{1}{4}\times$ as long as wide. Penultimate segment of maxillary palpus short and swollen.

Pronotum: Wide, convex, base (at posterior angles) as wide as apex, widest at 1st third. Apex nearly straight, anterior angles not projecting, widely rounded. Sides regularly convex throughout to the small, denticle-like posterior angles. Angles far removed from base, between angles and base proper a fairly large incision. Base slightly convex. Lateral channel narrow, especially to anterior angles, incurved around angles. Median line not recognizable. Prebasal transverse impression wide, conspicuous, marked by 5 large pits. Surface smooth, very glossy.

Elytra: Short, convex, widest in middle. With two striae and at least traces of 3rd stria, in some specimens very faint traces of outer striae detectable. Striae not well impressed, marked by rather coarse punctures, intervals depressed. 1st stria complete, 2nd shortened at base and at apex, 3rd recognizable by some punctures. Basal border incurved, not angulate. Surface glossy.

Aedeagus (Fig. 40): Short, rather depressed, apex not projecting. Both parameres 2-setose, left short and apically wide.

Variation: Little variation noted, apart from specimens with outer striae very vaguely indicated.

Distribution (Fig. 56): Northeastern Queensland, northernmost Northern Territory.

Material examined (12) Only type series.

Habits: Not known, all specimens captured at light. Thus far collected only in January.

Elaphropus convexulus (Darlington, 1963), new combination

(Figs 18, 41, 56)

Darlington, 1963, p. 30 (*Tachys*)

Types (not seen): Holotype in MCZ.

Type locality: Bamaga, northern Cape York Peninsula, Queensland.

Diagnosis

A small, unistriate species, distinguished by small size, rather elongate body, and prebasal transverse impression finely punctate.

Description

Measurements: Length: 2–2.25 mm; width: 0.85–0.9 mm; ratio width/length of pronotum: 1.23–1.26; ratio length/width of elytra: 1.41–1.43.

Colour: Dark reddish, two rather well defined maculae on elytra yellow. Anterior macula short, nearly attaining shoulder, medially attaining position of 3rd stria. Posterior macula circular to slightly transverse, medially reaching to between 3rd and 2nd striae. Mouthparts, antennae, and legs yellow. Lower surface reddish.

Head: Surface smooth. Eyes large, though not much projecting. Antennae medium sized, surpassing base of pronotum by c. 1.5 segments. Median segments c. 1.5× as long as wide.

Pronotum: Rather wide, but basal part strongly produced posteriorly, convex. Apex straight, anterior angles rounded off. Sides convex, widest at 1st third. Sides sinuate near posterior angles which are acute, projecting denticles, strongly removed from base. Prebasal transverse impression far posteriorly behind posterior angles, not interrupted, very finely punctate. Surface glossy.

Elytra: Convex, sides rounded. Shoulders rather angulate. Unistriate, striae not much impressed. Basal border slightly incurved, not angulate. Surface glossy.

Aedeagus (Fig. 41): Elongate, gently sloping to apex which is not produced, but rather stout. Both parameres 2-setose.

Variation: Little variation noted.

Distribution (Fig. 56): Northeastern Queensland, northern part of Northern Territory as far west as Mataranka.

Material examined (101): Queensland: Kuranda, N. Q. (BMH); Mc Leod River, 18 km W. of Mt. Carbine (CBM, ZSM). Northern Territory: 16°16' S, 136°05' E, 33 km S. of Borooloola (ANIC); 16°27' S, 136°05' E, 48 km SW. by S. of Borooloola (ANIC); 15°05' S, 133°07' E, Elsey Creek, 19 km SSE. of Mataranka (ANIC).

Habits: Apparently a riparian species, most specimens, however, captured at light. Darlington's specimens were presumably washed from debris. So far collected in January, April, and May.

Note: Originally thought to have a very limited range in northern Cape York Peninsula (DARLINGTON 1963), this species is apparently rather widely distributed in northern Australia, although it seems to occur rather sporadically.

Elaphropus convexus (Macleay, 1871), new combination
Figs 19, 42, 57)

Macleay, 1869–73 (1871), p. 115 (*Bembidion*)

SLOANE 1896, p. 366; 1921, p. 198, 202 (*Tachys*)

CSIKI 1929, p. 175 (*Tachys*)

DARLINGTON 1963, p. 29 (*Tachys*)

Bembidion bistriatum Macleay, 1871, p. 115 (nec Duftschmid!)

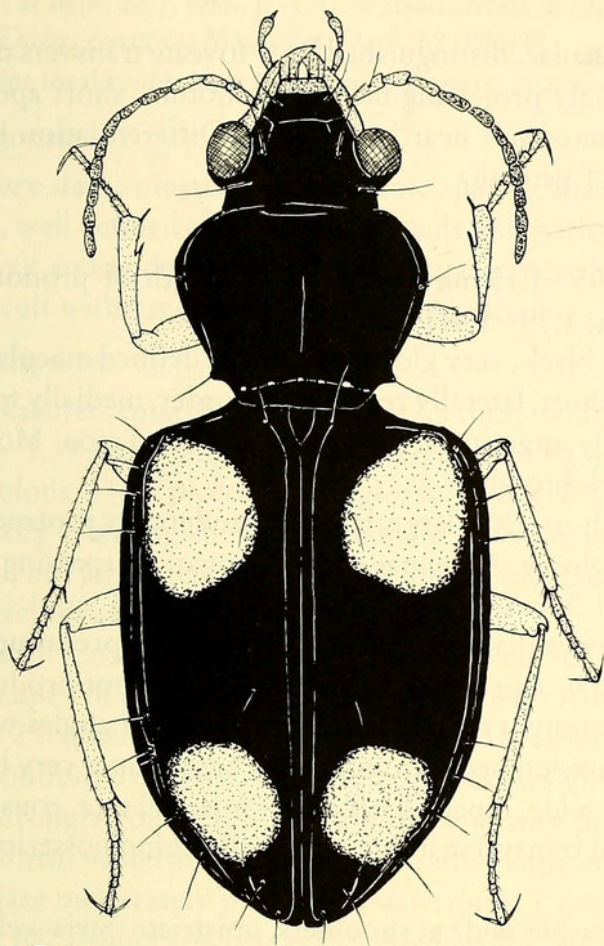
SLOANE 1896, p. 357, 363; 1921, p. 202 (*Tachys*)

Synonymy confirmed by SLOANE (1896, 1921).

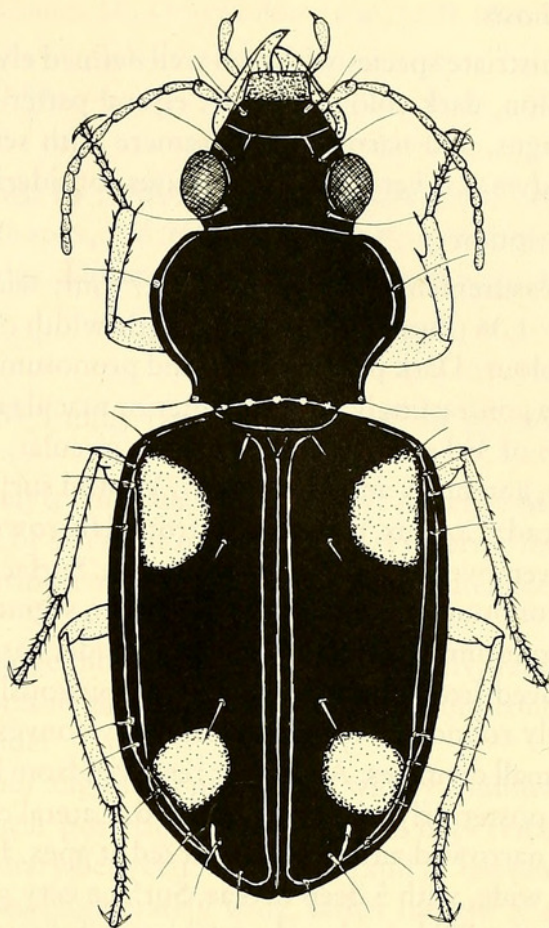
Types: Holotype, if at all designated, perhaps either in MMS or in AMS (not seen). I saw 2 paratypes of "*Bembidion convexum* MacL, Gayndah", fixed on a card; 4 paratypes of "*Bembidion bistriatum* MacL, Gayndah", also fixed together on a card, and 2 further paratypes of "*Bembidion bistriatum* MacL, Gayndah", fixed on a card, one of which, however, is an exemplar of *Elaphropus spenceri* (Sloane), the other perhaps, too, but it is heavily destroyed (All ANIC). I do not know who designated these specimens paratypes. Perhaps they are actually syntypes. Judging from these specimens, *B. convexum* and *B. bistriatum* is identical. In spite of transferring of *Tachys convexus* to genus *Elaphropus* the name *convexus* will continue according to article 59b of the International Code of Nomenclature, although *bistriatus* originally had priority.

Fig. 19–22: *Elaphropus*.

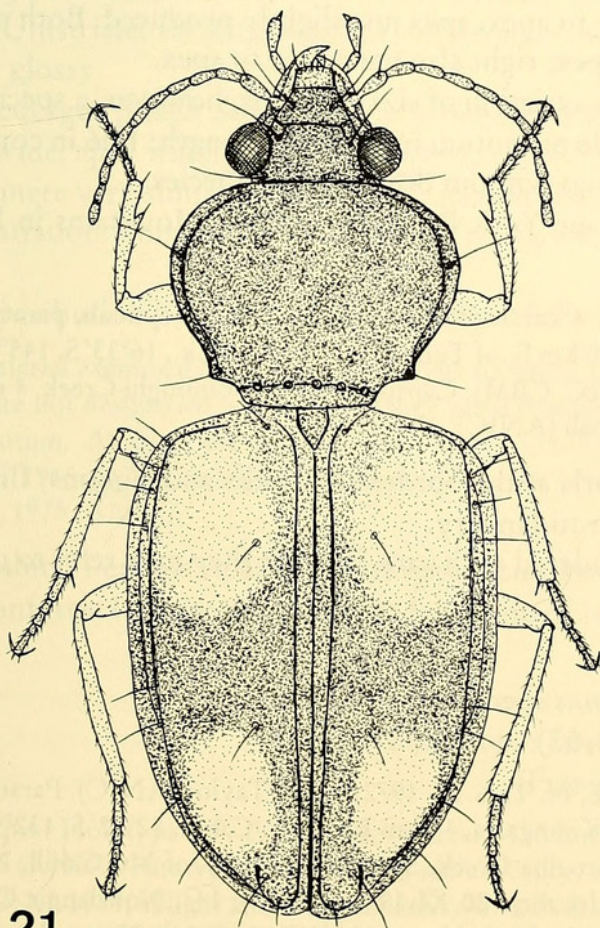
19. *E. convexus* (Macleay), length: 2.6 mm; 20. *E. didymus* spec. nov., length: 2.35 mm; 21. *E. convexicollis* spec. nov., length: 2.5 mm; 22. *E. spenceri* (Sloane), length: 2.65 mm.



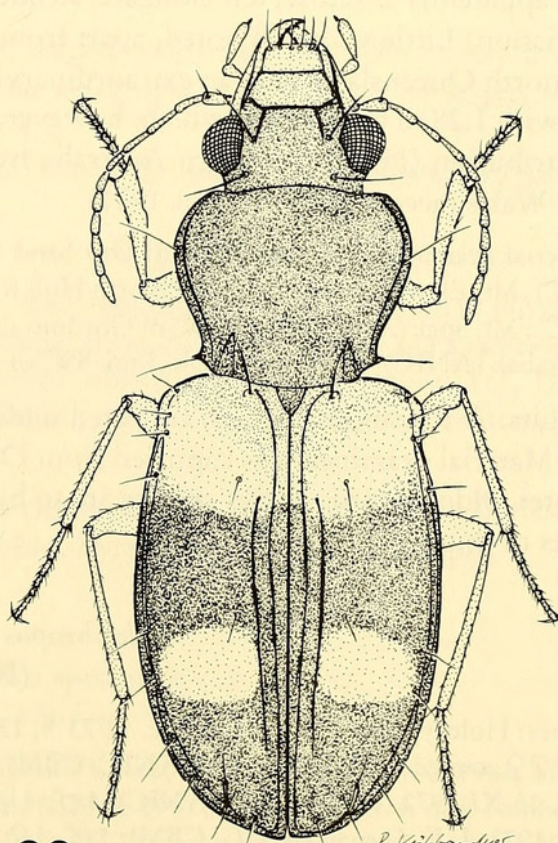
19



20



21



22

R. Kribanov

Diagnosis

Unistriate species with two well defined elytral maculae, distinguished by 5-foveate transversal impression, dark colour, distinct elytral pattern, strongly projecting base of pronotum, short apex of aedeagus, and narrow left paramere with setae situated not near lower edge. Differentiation from *E. didymus* is very difficult without considering of ♂ genitalia.

Description

Measurements: Length: 2.4–2.7 mm; width: 1.05–1.15 mm; ratio width/length of pronotum: 1.24–1.36 (mean: 1.28); ratio length/width of elytra: 1.39–1.41.

Colour: Dark piceous, head and pronotum nearly black, very glossy. Two well defined maculae on elytra contrastingly yellow. Anterior macula rather short, laterally reaching to border, medially to position of 3rd stria. Posterior macula circular, medially attaining at least position of 2nd stria. Mouthparts, antennae, and legs yellow. Ventral surface dark brown.

Head: Convex, rather wide, frontal furrows very short. Eyes large, laterally moderately protruding, well removed from apex of pronotum. Surface very glossy. Antennae rather elongate, surpassing base of pronotum by c. 2 segments. Median segments c. 1.5× as long as wide.

Pronotum: Convex, moderately wide, base narrower than apex. Posterior angles of pronotum far removed from elytral base and conspicuously narrow. Apex straight, anterior angles not produced, widely rounded. Sides anteriorly very convex, then straight or even sinuate to posterior angles which are small denticles. Angles far removed from base, incision between angles and base proper very large, base posteriorly strongly produced. Lateral channel wide, especially at anterior lateral seta, considerably narrowed anteriorly, incurved at apex. Prebasal transverse impression well behind posterior angles, wide, with 5 deep foveae. Surface very glossy.

Elytra: Wide, rather short, sides slightly convex, rather wide at shoulders, unistriate. Stria well impressed, complete, impunctate. Shoulders somewhat angulate. Basal border widely incurved, not angulate. Surface very glossy.

Aedagus (Fig. 42): Short and high, steeply sloping to apex, apex just slightly produced. Both parameres apparently 2-setose, left elongate, slender at apex, right also narrowed to apex.

Variation: Little variation noted, apart from some variation of size. There is, however, a specimen from north Queensland with an extraordinarily wide pronotum (ratio width/length: 1.36 in comparison with 1.28 in type series) which, however, belongs without doubt to this species.

Distribution (Fig. 57): Eastern Australia from Cape York Peninsula to Blue Mountains in New South Wales (according to SLOANE 1921).

Material examined (23): Queensland: Dry Sand Creek, 4 km S. of Tamborine (CBM); Gayndah, paratypes! (ANIC); Mt. Eliot, N-Slope (ANIC); North Hull River, 20 km E. of Tully (CBM); Mary Ck., 16°33' S, 145°12' E (ANIC); Mt. Spec (ANIC); 8 km SW. of Gordonvale (ANIC, CBM); Cairns (ANIC); Combughi Creek, 4 mi. S. of Yarrabah (ANIC); Dejinghe Creek, 3 mi. SW. of Yarrabah (ANIC).

Habits: A ripicolous species, collected under debris at the borders of creeks and lagoons, flies to light. Material examined was captured from October to January.

Note: Older records of this species are to be considered with care, because they may refer to other species of this group.

Elaphropus didymus spec. nov.

(Figs 20, 57)

Types: Holotype: ♂, Holmes Jungle, 12°23' S, 130°57' E, N. T., 6. XI. 1972, R. W. Taylor (ANIC). Paratypes: 1 ♂, 2 ♀♀, same locality, same date (ANIC, CBM); 1 ♂, Koongarra, 15 km E. of Mt. Cahill, 12°52' S, 132°50' E, N. T., 15. XI. 1972, M. S. Upton (ANIC); 1 ♂, 4 ♀♀, Baroalba Creek, Springs, 19 km E. of Mt. Cahill, N. T., 16. XI. 1972, J. E. Feehan (ANIC, CBM); 1 ♂, 1 ♀, same locality, 20. XI. 1972 (ANIC); 1 ♀, Nourlangie Creek, 8 km N. of Mt. Cahill, 12°48' S, 132°42' E, N. T., 19. XI. 1972, M. S. Upton (ANIC); 1 ♂, 1 ♀, Howard Springs,

N. T. at light, 27.I.1968, J. A. L. Watson (ANIC); 1 ♀, New Guinea, SE, Oriomo River, 6 m, 12.II.1964, H. C., det. *Tachys convexus* Macl., det. Darl. '68 (BMH).

Type locality: Holmes Jungle, near Darwin, Northern Territory.

Diagnosis

Very dark, unistriate, bimaculate species, distinguished by 5-foveate prebasal transversal impression, well defined elytral maculae, aedeagus with elongate apex, and left paramere with asymmetrically convex and wide apex with setae situated near lower edge. Differentiation from *E. convexus* is very difficult without consideration of ♂ genitalia.

Description

Measurements: Length: 2.25–2.5 mm; width: 0.95–1 mm; ratio width/length of pronotum: 1.28–1.33; ratio length/width of elytra: 1.4–1.43.

Colour: Dark piceous, very glossy, two well defined elytral maculae dark yellow. Anterior macula laterally attaining shoulder, medially attaining position of 4th or at most 3rd stria. Posterior macula small, not attaining lateral border, medially attaining position of 3rd stria. Mouthparts, antennae, and legs yellow. Lower surface piceous.

Head: Convex, frontal furrows short, curved. Eyes large, not much projecting laterally, removed from apex of pronotum. Surface very glossy. Antennae rather elongate, surpassing base of pronotum by c. 2 segments. Median segments c. 1.5× as long as wide.

Pronotum: Convex, rather wide. Apex straight, anterior angles not projecting, widely rounded. Sides strongly rounded. Only a short sinuosity present near posterior angles. Incision between small dentiform posterior angle and base rather large, intermediary between *E. convexus* and *E. convexicollis*. Base moderately produced posteriorly. Lateral channel moderately wide, rather narrow at apex, incurved around anterior angles. Median line not recognizable. Prebasal transverse impression slightly behind posterior angles, wide, with 5 large foveae. Surface very glossy.

Elytra: Wide, convex, sides nearly parallel. Shoulders rather angulate, but less so than in *E. convexus*. Unistriate, 1st stria complete, moderately impressed. Basal border incurved, not angulate. Surface very glossy.

Aedeagus (much alike Fig. 43): Elongate, depressed, apex strongly produced. Parameres 2-setose, left wide, apex widely and asymmetrically rounded, setae situated near lower edge. Aedeagus and left paramere very similar to those of *E. convexicollis* (Fig. 43).

Variation: Some minor variation in relative width of pronotum and in size of elytral maculae present.

Distribution (Fig. 57): Northern parts of Northern Territory, Southeastern New Guinea.

Material examined (18): Apart from type series two further specimens are tentatively appointed to this species, but are not designated paratypes, as they possess somewhat larger posterior elytral maculae and a rather narrow pronotum. As both are females, their status cannot be settled reliably: Northern Territory: 1 ♂, Darwin, 21.VI.1966 (ANIC); 1 ♀, Mc Arthur River, 16°47'S, 135°45'E, 14 km S. by W. of Cape Crawford, N. T. 25.X.1975 (ANIC).

Habits: Perhaps riparian, most specimens, however, caught at light. One specimen in Berlese trap in rainforest (monsoon forest). So far captured in October, November, January, and April.

Elaphropus convexicollis spec. nov.

(Figs 21, 43, 57)

Types: Holotype: ♂, Frog Hollow Creek, 135 km N. of Hall's Creek, W. A., at light, 14.XI.1984, M. & B. Baehr (ANIC). Paratypes: 15 ♂♂ ♀♀, same locality, same date (CBM); 25 ♂♂ ♀♀, Ord River near Ivanhoe, W. A., 13.XI.1984, at light and on sand banks, M. & B. Baehr (CBM); 1 ♀, Kununurra, N. W. A., 13.–22.II.1968, E. Matthews (ANIC); 1 ♀, Victoria River, 85 km E. of Timber Creek, N. T., 9.XI.1984, M. & B. Baehr (CBM);

60♂♂♀♀, 17 km NE. of Willeroo, N. T., at light, 9. XI. 1984, M. & B. Baehr (ANIC, CBM, ZSM); 13♂♂♀♀, Tindal N. T. 14°31' S, 132°22' E, 1–20. XII. 1967, light trap, W. J. M. Vestjens (ANIC); 2♂♂, Katherine, N. T., at light, 7. II. 1968, J. A. L. Watson (ANIC); 1♂, Mc Arthur River, 16°47' S, 135°45' E, 14 km SW. by S. of Cape Crawford, N. T., 25. X. 1975, M. S. Upton (ANIC); 2♂♂, 1♀, 12 km N. of Taroom, Queensland, M. & B. Baehr (CBM); 1♀, Peak Downs, Mus. Godeffroy No/3065 (ANIC); 1 (sex?), Gayndah, Mus. Godeffroy, No/3208 (ANIC).

Type locality: 135 km N. of Hall's Creek, Western Australia.

Diagnosis

A convex, reddish species, distinguished by large, ill defined elytral maculae, wide, laterally strongly rounded pronotum without distinct sinuosity at posterior angles, produced apex of aedeagus, and asymmetrically rounded, wide apex of left paramere with setae inserted near lower edge.

Description

Measurements: Length: 2.3–2.6 mm; width: 1–1.15 mm; ratio width/length of pronotum: 1.35–1.37; ratio length/width of elytra: 1.36–1.39.

Colour: Reddish to light brown, head and pronotum slightly darker, elytra with two ill defined, not well contrasting maculae. Anterior macula large, especially indistinct, vaguely reaching shoulder, medially attaining about position between 3rd and 4th striae. Posterior macula slightly more distinct, circular, medially attaining c. 2nd stria. Mouthparts, antennae, and legs yellow. Lower surface reddish.

Head: Convex, rather wide, frontal furrows short. Eyes large, laterally moderately projecting, removed from apex of elytra. Surface moderately glossy. Antennae rather elongate, surpassing base of pronotum by c. 2 segments. Median segments c. 1.5× as long as wide.

Pronotum: Convex, wide, base as wide as apex. At base comparatively wider in relation to base of elytra than either species of this group. Apex straight, anterior angles not produced, widely rounded. Pronotum widest behind 1st third. Sides regularly convex to posterior angles, not sinuate. Posterior angles small, barely projecting denticles. Angles removed from base, incision between angles and base less deep than in *E. convexus* and *E. didymus*. Base less projecting posteriorly. Lateral channel fairly wide, not much narrowed to anterior angles, incurved around angles. Median line not visible. Prebasal transversal impression not far behind posterior angles, wide, with 5 foveae. Surface glossy.

Elytra: Convex, rather wide and short. Shoulders more rounded than in *E. convexus*, sides more convex. Unistriate, stria rather well impressed, complete, slightly punctate. Basal border incurved, but less than in *E. convexus*, not angulate. Surface rather glossy.

Aedeagus (Fig. 43): Elongate, rather depressed, gently sloping to apex. Apex slender, strongly projecting. Both parameres 2-striate, both apically rather stout, left asymmetrically rounded at apex, setae inserted near to lower edge.

Variation: Little variation noted, even between specimens from Queensland and Western Australia. In eastern specimens pattern is slightly more distinct.

Distribution (Fig. 57): Queensland, south to at least Rockhampton, northern parts of Northern Territory, northwestern Australia north of Great Sandy Desert.

Material examined (124): Only type series.

Habits: Ripicolous, most specimens, however, collected at light, some at rather wide distances from water.

Note: This species was perhaps formerly confounded with *E. convexus*, as both species occur in eastern Queensland. This and both foregoing species are very closely related and they exhibit striking similarities in a rather curious pattern: *E. convexus* and *E. didymus* are very similar in colour and pattern, and *E. convexcollis* and *E. didymus* have nearly identical ♂ genitalia. In shape and structure of pronotum, *E. didymus* is rather intermediate. However, distribution of the species, with sympatric occurrence of *E. convexcollis* with either *E. convexus* and *E. didymus* is evidence of a specific rather than subspecific evolution within the three species.

Diagnosis

A very characteristic group of three unistriate or bistriate species, easily distinguished by pronotum without a prebasal transverse impression, posterior angle with an acute tooth removed from base, or completely rounded, and by elytra sinuate behind shoulders and with lateral channel obsolete in sinuosity.

Elaphropus spenceri (Sloane, 1896), new combination
(Figs 22, 44, 58)

Sloane, 1896 a, p. 380; 1896 b, p. 357, 366; 1921, p. 198, 203 (*Tachys*)

CSIKI 1929, p. 199 (*Tachys*)

Types (not seen): Syntypes in the Collection of DEI.

Type locality: Larapintine region, Central Australia.

Diagnosis

An elongate, reddish species with bistriate, bimaculate elytra, from related *E. denticollis* distinguished by larger size, lighter colour, larger and less well defined elytral maculae, less protruding posterior pronotal angles, and less convex, more elongate elytra with lateral channel interrupted behind shoulders.

Description

Measurements: Length: 2.5–2.75 mm; width: 0.95–1.05 mm; ratio width/length of pronotum: 1.19–1.23; ratio length/width of elytra: 1.42–1.45.

Colour: Reddish-brown, with two ill defined elytral maculae. Anterior macula large, less well defined than posterior macula, sometimes whole anterior half of elytra light. Shoulders slightly darker. Posterior macula transverse, medially attaining c. 2nd stria, sometimes very indistinct. Mouthparts, legs, and antennae yellow. Lower surface reddish to brownish.

Head: Rather depressed, frontal furrows short, curved. Eyes large, laterally strongly projecting, removed from apex of pronotum. Antennae moderately elongate, surpassing base of pronotum by c. 2 segments. Median segments over $1.5\times$ as long as wide. Surface glossy.

Pronotum: Rather narrow, slightly convex, base as wide as apex. Apex straight, anterior angles not projecting, widely rounded. Sides anteriorly convex, with a faint sinuosity near posterior angles which are acute, laterally projecting denticles slightly removed from base, so that there is a small excision between angles and base. Median lobe rather convex. Lateral channel wide, conspicuous, especially in middle and near base, widely incurved around anterior angles and prolonged to near middle. Prebasal transverse impression lacking. Surface glossy.

Elytra: Elongate-ovate, dorsally rather depressed. Shoulders prominent, basal border thickened at shoulders. Lateral border behind shoulders distinctly sinuate, then regularly convex. Lateral channel obliterated at incision, lateral border there not visible from above. Bistriate, striae moderately impressed, intervals depressed. 1st stria complete, 2nd shortened at base and apex. Basal border little incurved. Surface glossy.

Aedeagus (Fig. 44): Elongate, very low, apex produced, slightly upturned. Both parameres 3-se-tose, left elongate, right rather narrow.

Variation: Little variation in size and shape noted, but some variation in pattern recognized: in Queensland specimens elytral pattern tends to be more distinct, in northern and especially western specimens elytral pattern is very vague, sometimes anterior maculae are not recognizable, but anterior part of elytra is altogether light.

Distribution (Fig. 58): Widely distributed in northern Queensland, south at least to Rockhampton; Western Australia to at least Ashburton River; Central Australia south to northern parts of South Australia.

Material examined (ca 350): Material examined from 45 localities throughout the known range (see. Fig. 58).

Habits: One of the most widely distributed and most common Tachyine species of Australia, especially in dry areas of the centre and the west, where it occurs in almost all sorts of riparian habitats. It is mostly the single *Tachyura* species in such localities. SLOANE (1921) describes the collecting circumstances of the species in North Queensland. It can be found as well under debris, as in sand and gravel of creeks and pools, and it also flies to light. Collected in almost all months.

Elaphropus denticollis spec. nov.

(Figs 23, 58)

Types: Holotype: ♀, 12°47'S, 132°51'E, 19 km NE. by E. of Mt. Cahill, N. T., 16.XI.1972, M. S. Upton (ANIC).

Type locality: Mt. Cahill, Arnhem Land, Northern Territory.

Diagnosis

A dark coloured, bimaculate species, distinguished from related *E. spenceri* by smaller size, dark colour, small and well defined elytral maculae, laterally and dorsally convex elytra with lateral channel not interrupted at incision behind shoulders, and by more protruding posterior pronotal angles.

Description

Measurements: Length: 2.2 mm; width: 0.95 mm; ratio width/length of pronotum: 1.25; ratio length/width of elytra: 1.39.

Colour: Dark piceous, two well defined elytral maculae yellow. Anterior macula short, only laterally reaching to shoulders, medially attaining c. position of 4th stria. Posterior macula slightly transverse, medially attaining position of 3rd stria. Legs, antennae, and mouthparts yellow, penultimate segment of maxillary palpus slightly infuscate. Lower surface piceous.

Head: Convex, frontal furrows short, diverging. Eyes laterally widely protruding, removed from apex of pronotum. Surface smooth, very glossy. Antennae medium sized, surpassing base of pronotum by c. 2 segments. Median segments c. 1.5× as long as wide.

Pronotum: Convex, rather wide, base wider than apex. Apex straight, anterior angles not produced, widely rounded, sides rather convex, straight near posterior angles. Angles a strongly produced, acute denticle removed from base, hence a short excision between angle and base present. Median lobe of base convex. Lateral channel conspicuous, deep, wide in middle and near posterior angles, narrow and strongly incurved at anterior angles, prolonged to near middle. Median line not recognizable. Prebasal transverse impression lacking. Surface very glossy.

Elytra: Short, laterally convex, rather wide, also dorsally fairly convex. Incision behind shoulders less strong than in *E. spenceri*, shoulders less prominent. Sides strongly rounded. Lateral channel not interrupted at incision, lateral border visible from above. Bistriate, 1st stria complete, 2nd shortened at base and at apex. Basal border just slightly curved inwards. Surface very glossy.

Aedeagus: Unknown.

Variation: Unknown.

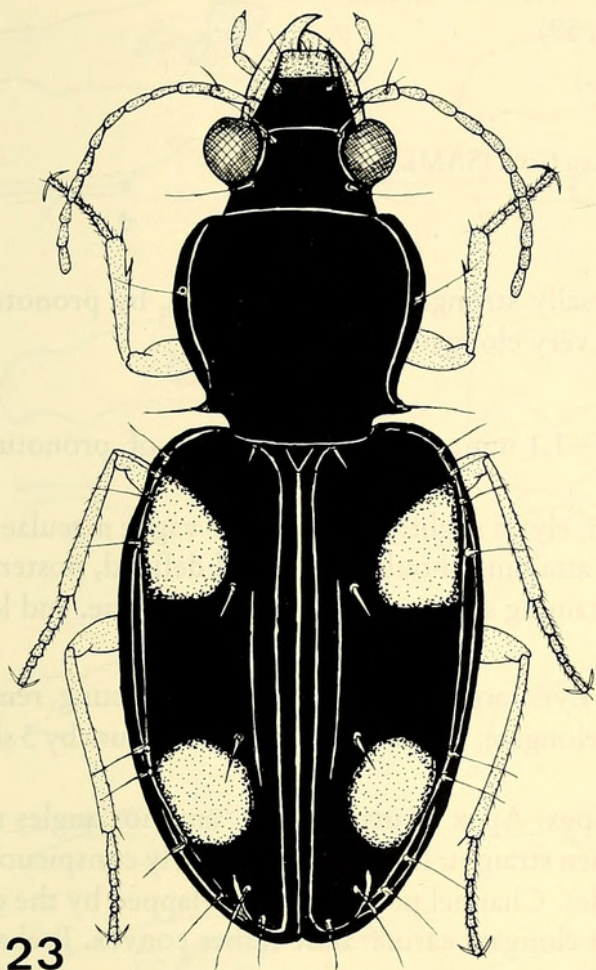
Distribution (Fig. 58): Known only from western Arnhem Land, Northern Territory.

Material examined (1): Only holotype.

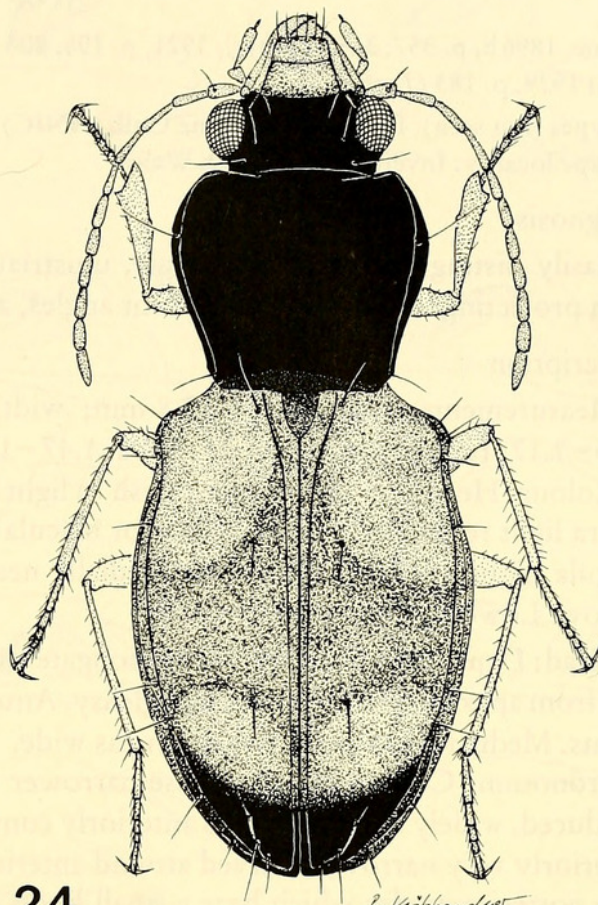
Habits: Unknown, collected at the same locality with other *Tachyura* species in November.

Fig. 23–25: *Elaphropus*.

23. *E. denticollis* spec. nov., length: 2.2 mm; 24. *E. iaspiceus* (Sloane), length: 2.65 mm; 25. *E. curticolis* (Sloane), length: 2.1 mm.

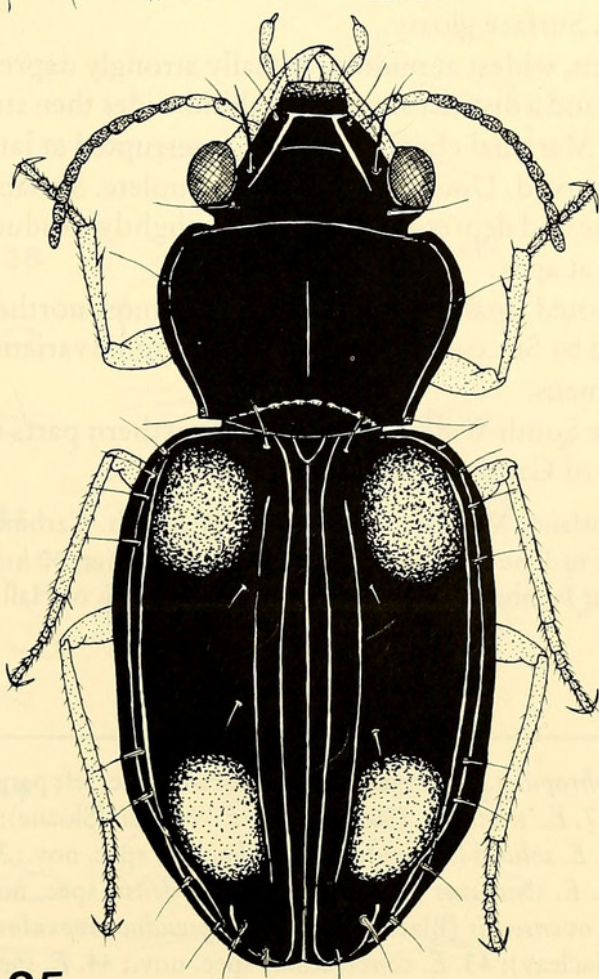


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24

R. V. Gibbard



25

Elaphropus iaspideus (Sloane, 1896), new combination
(Figs 24, 45, 59)

Sloane, 1896b, p. 357, 365 (*Tachys*); 1921, p. 198, 203 (*Tachys*)

CSIKI 1929, p. 183 (*Tachys*)

Types (not seen): Probably in Sloane Coll. (ANIC) or in Lea Coll. (SAM).

Type locality: Inverell, New South Wales.

Diagnosis

Easily distinguished by bimaculate, unistriate, dorsally strongly depressed elytra, by pronotum with projecting, but rounded posterior angles, and by very elongate antennae.

Description

Measurements: Length: 2.4–2.8 mm; width: 0.9–1.1 mm; ratio width/length of pronotum: 1.15–1.17; ratio length/width of elytra: 1.47–1.48.

Colour: Head and pronotum reddish to light brown, elytra slightly lighter. Two vague maculae on elytra light reddish to yellow. Anterior macula large, attaining shoulders, very ill defined, posterior macula slightly lighter, transverse, medially nearly attaining suture. Mouthparts, antennae, and legs yellow. Lower surface reddish.

Head: Depressed, frontal furrows elongate, curved. Eyes large, laterally strongly projecting, removed from apex of pronotum. Surface glossy. Antennae elongate, surpassing base of pronotum by 3 segments. Median segments c. 2× as long as wide.

Pronotum: Convex, narrow, base narrower than apex. Apex nearly straight, anterior angles not produced, widely rounded. Sides anteriorly convex, then straight. Lateral channel fairly conspicuous, anteriorly very narrow, incurved around anterior angles. Channel posteriorly overlapped by the obtuse posterior angles which bear a small knob and an elongate carina. Base rather convex. Prebasal transverse impression lacking. Surface glossy.

Elytra: Rather wide, oviform, widest at middle, dorsally strongly depressed. Shoulders sloping, laterally with thickened margin and a distinct sinuosity behind. Sides then straightly widened to middle, then evenly rounded to apex. Marginal channel narrow, interrupted at lateral incision. Basal borders shortened at shoulder, not incurved. Unistriate, 1st stria complete. Surface glossy.

Aedeagus (Fig. 45): Elongate and depressed. Apex stout, slightly produced. Right paramere with 2, left with 3 setae, both narrow at apex.

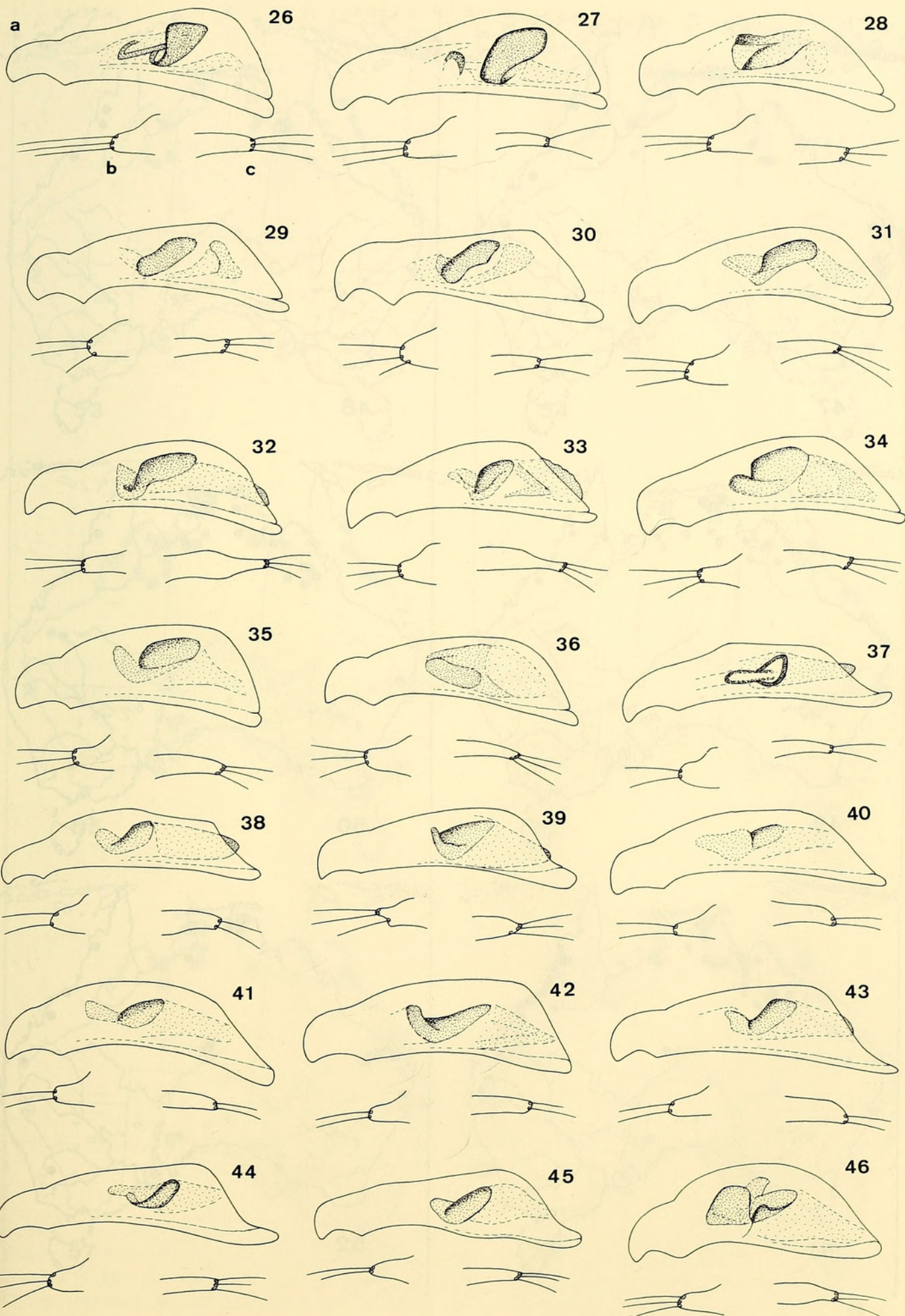
Variation: Little variation noted, apart from size which is in most northern and northwestern specimens well under the size noted by SLOANE (1896b, 1921). Also some variation in pattern noted. Pattern more distinct in eastern specimens.

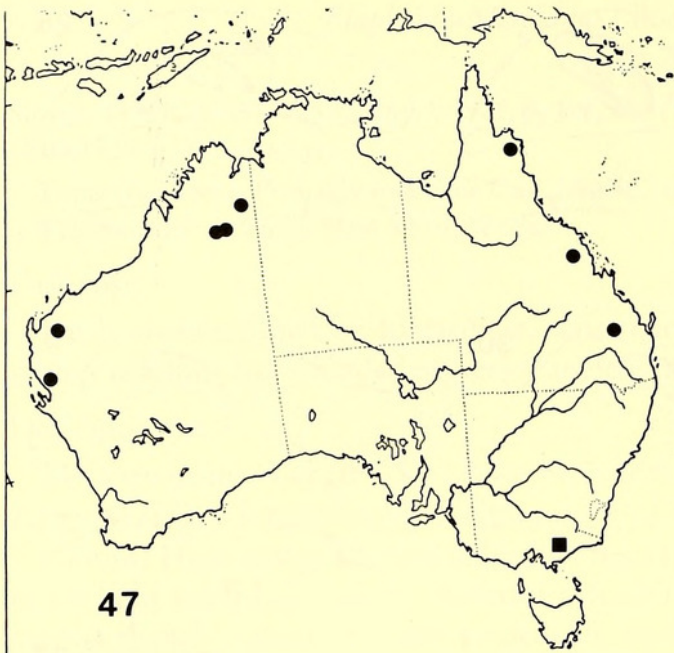
Distribution (Fig. 59): New South Wales, Queensland, northern parts of Northern Territory, and northwestern Australia north of Great Sandy Desert.

Material examined (30): Queensland: Mc Leod River, 18 km W. of Mt. Carbine (CBM). Northern Territory: Fergusson River, 31 km SE. by S. of Pine Creek (ANIC); East Baines River, 60 km W. of Timber Creek (CBM). Western Australia: Ord River near Ivanhoe (CBM); Ord River, 105 km N. of Hall's Creek (CBM).

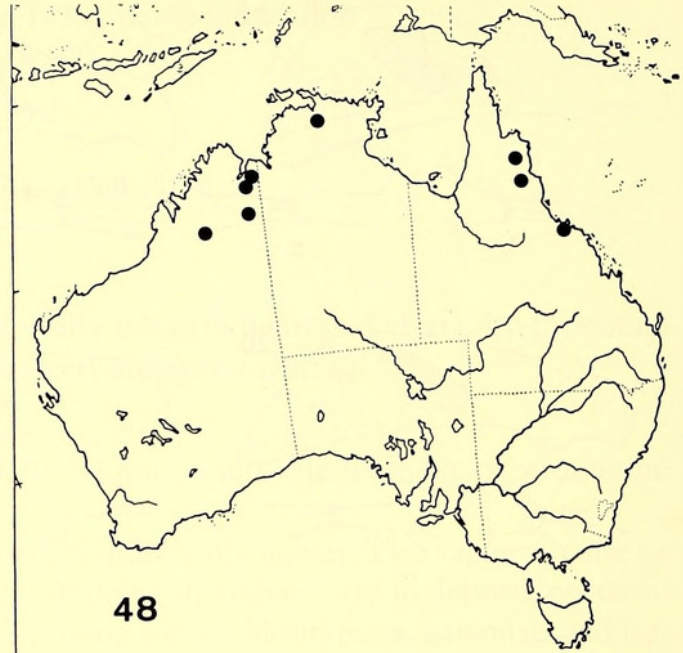
Fig. 26–46: ♂ genitalia of *Elaphropus* a. Aedeagus; b. right paramere; c. left paramere. Scale: 0.2 mm.

26. *E. amplipennis* (Macleay); 27. *E. nervosus* (Sloane); 28. *E. banksi* (Sloane); 29. *E. buprestoides* (Sloane); 30. *E. bipustulatus* (Macleay); 31. *E. solidus* (Sloane); 32. *E. subopacus* spec. nov.; 33. *E. bembidiiformis* (Jordan); 34. *E. leptothorax* spec. nov.; 35. *E. striolatus* (Macleay); 36. *E. ordensis* spec. nov.; 37. *E. flavicornis* (Sloane); 38. *E. brittoni* spec. nov.; 39. *E. ovensensis* (Blackburn); 40. *E. pseudoconvexulus* spec. nov.; 41. *E. convexulus* (Darlington); 42. *E. convexus* (Macleay); 43. *E. convexcollis* spec. nov.; 44. *E. spenceri* (Sloane); 45. *E. iaspideus* (Sloane); 46. *E. curticolis* (Sloane).





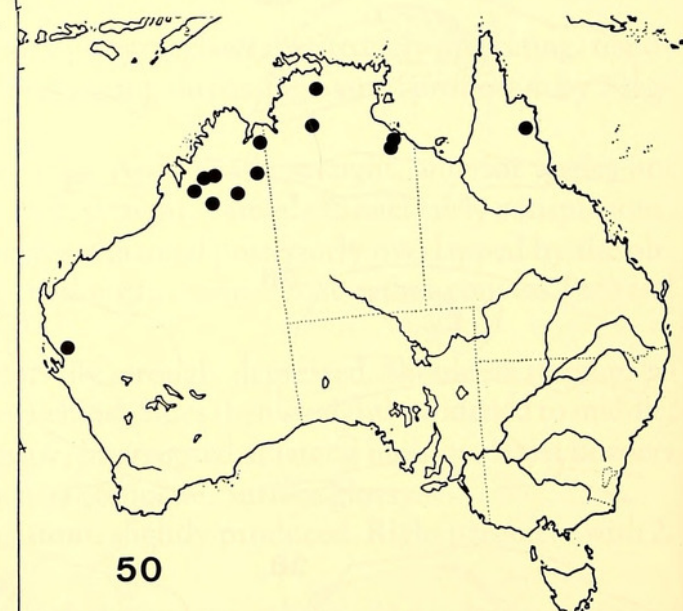
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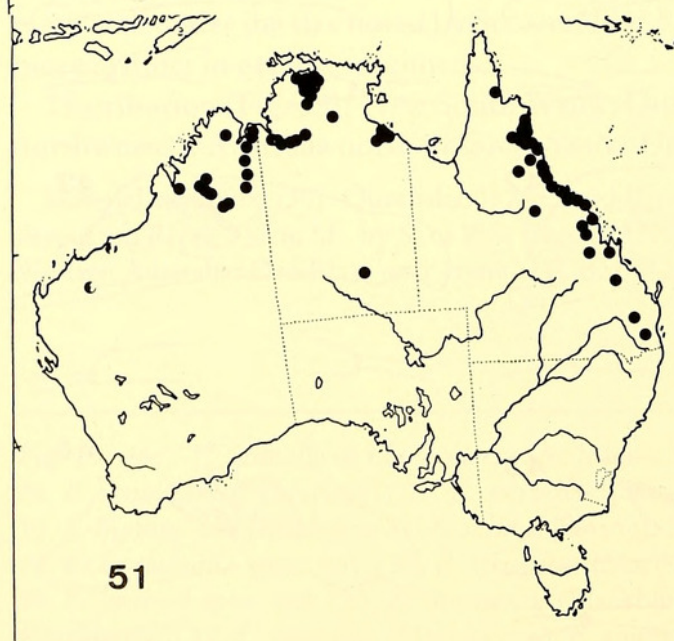
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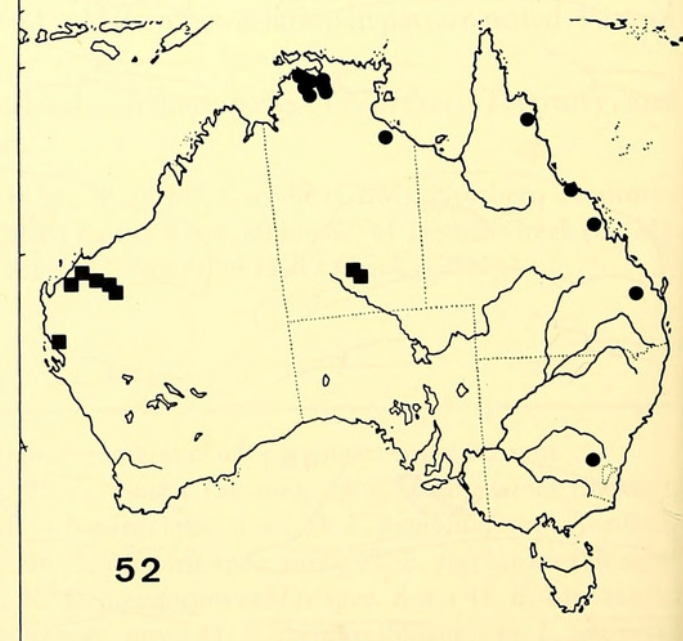
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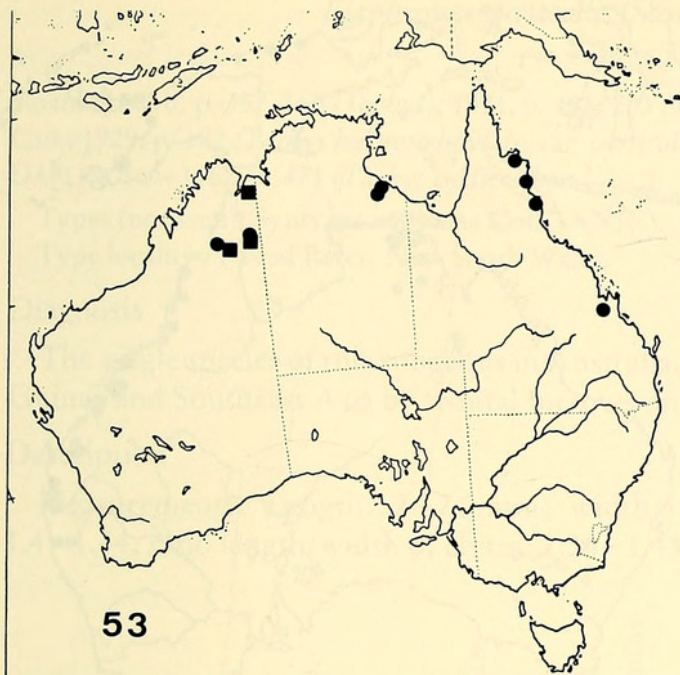
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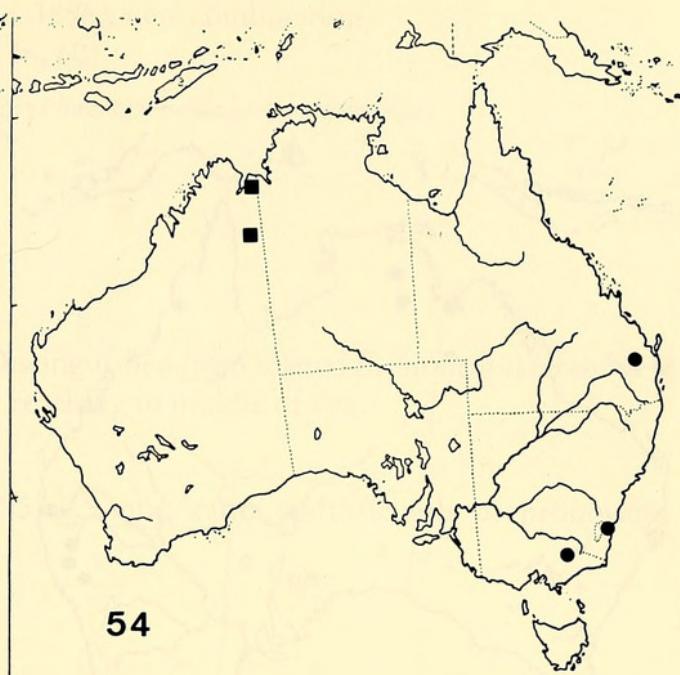
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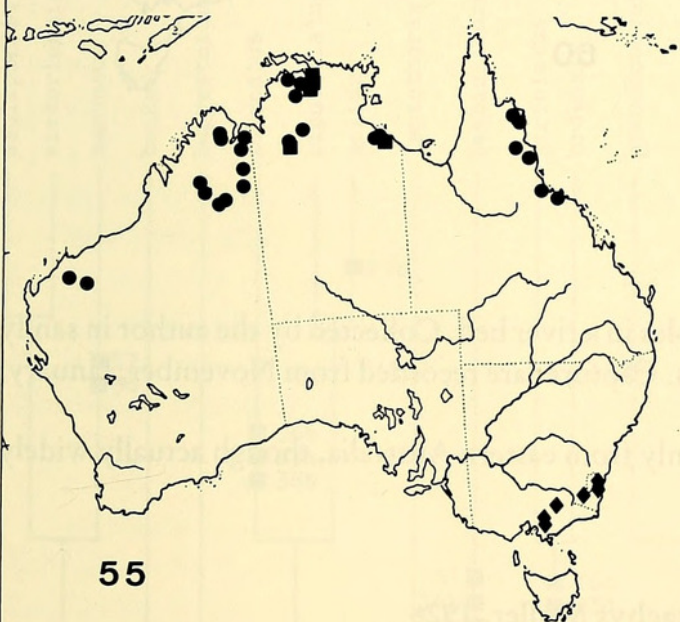
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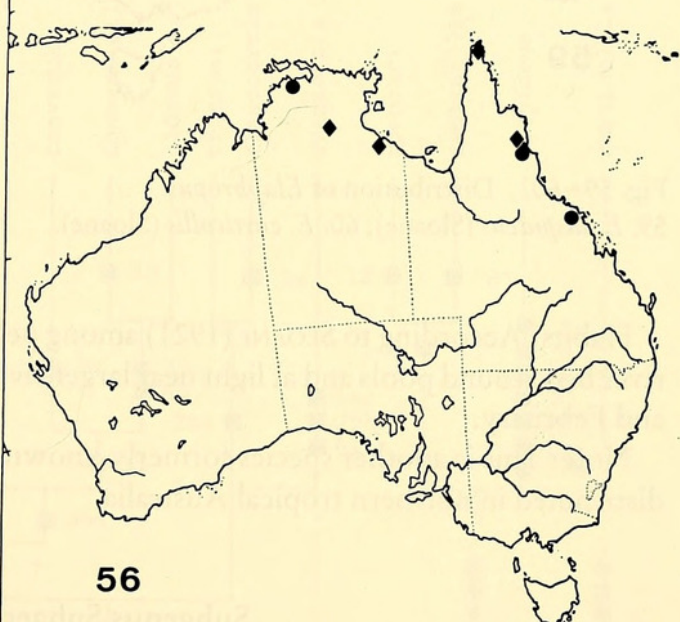
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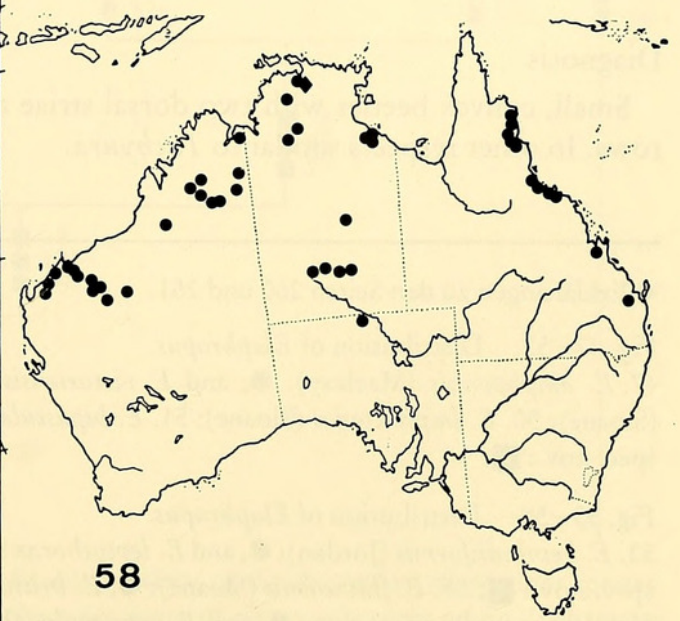
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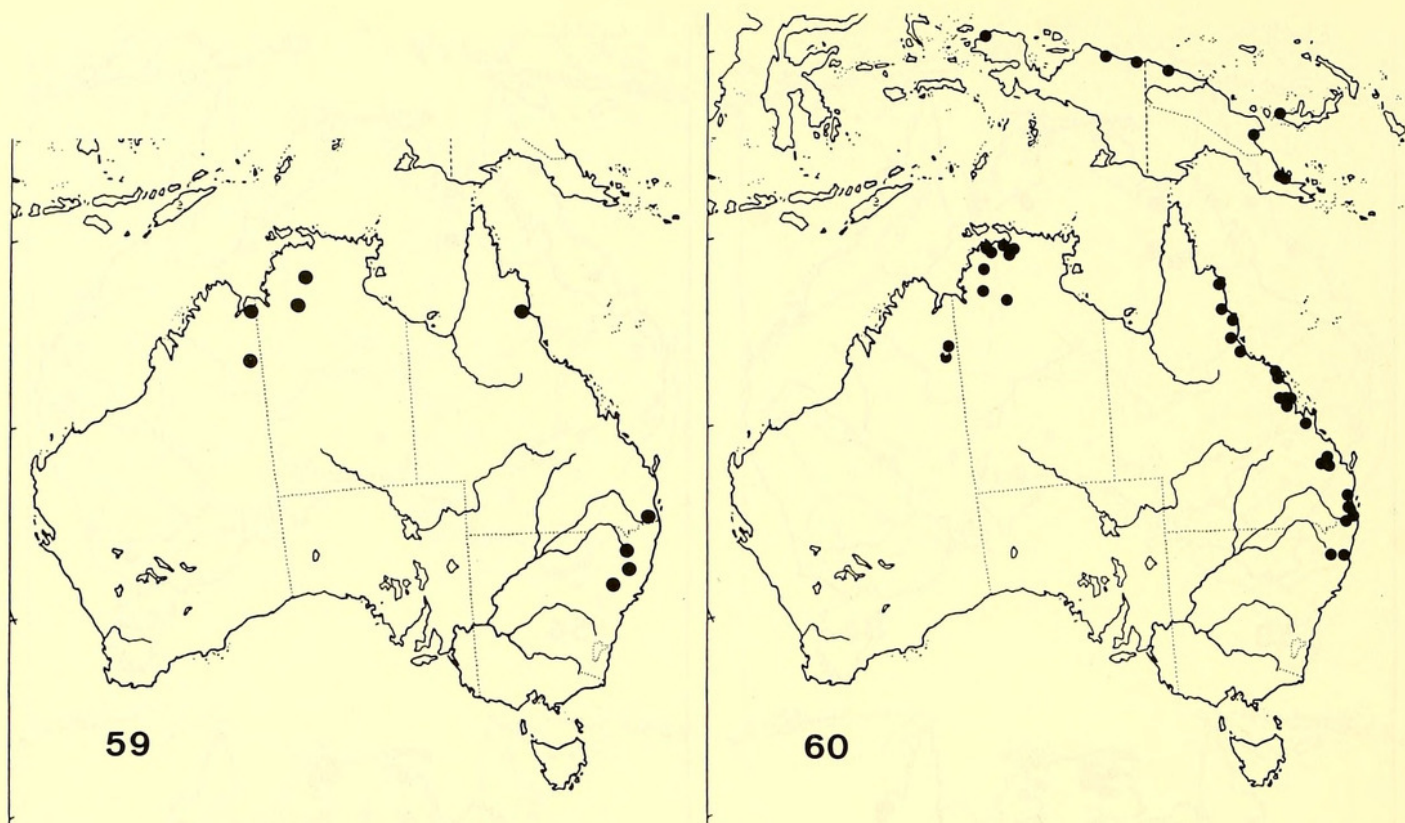


Fig. 59–60. Distribution of *Elaphropus*.
59. *E. iaspideus* (Sloane); 60. *E. curticolis* (Sloane).

Habits: According to SLOANE (1921) among pebbles in a river bed. Collected by the author in sandy river bed around pools and at light near larger rivers. Captures are recorded from November, January, and February.

Note: This is another species formerly known only from eastern Australia, though actually widely distributed in northern tropical Australia.

Subgenus *Sphaerotachys* Müller, 1926

Diagnosis

Small, convex beetles with two dorsal striae and elongate, conspicuously convergent frontal furrows. In other respects similar to *Tachyura*.

◀ Erklärungen zu den Seiten 260 und 261.

Fig. 47–52: Distribution of *Elaphropus*.

47. *E. amplipennis* (Macleay): ●, and *E. victoriensis* (Blackburn): ■; 48. *E. nervosus* (Sloane); 49. *E. banksi* (Sloane); 50. *E. buprestoides* (Sloane); 51. *E. bipustulatus* (Macleay); 52. *E. solidus* (Sloane): ●, and *E. subopacus* spec. nov.: ■.

Fig. 53–58: Distribution of *Elaphropus*.

53. *E. bembidiiformis* (Jordan): ●, and *E. leptothorax* spec. nov.: ■; 54. *E. striolatus* (Macleay): ●, and *E. ordensis* spec. nov.: ■; 55. *E. flavicornis* (Sloane): ●, *E. brittoni* spec. nov.: ■, and *E. ovensensis* (Blackburn): ◆; 56. *E. pseudoconvexus* spec. nov.: ●, and *E. convexus* (Darlington): ◆; 57. *E. convexus* (Macleay): ■, *E. didymus* spec. nov.: ◆, and *E. convexicollis* spec. nov.: ●; 58. *E. spenceri* (Sloane): ●, and *E. denticollis* spec. nov.: ◆.

Elaphropus curticollis (Sloane, 1896), new combination
(Figs 25, 46, 60)

Sloane, 1896b, p. 357, 363 (*Tachys*); 1921, p. 198, 203 (*Tachys haemorrhoidalis* var. *curticollis*)

CSIKI 1929, p. 182 (*Tachys haemorrhoidalis* var. *curticollis*)

DARLINGTON 1962, p. 471 (*Tachys curticollis*)

Types (not seen): Syntypes in Sloane Coll. (ANIC).

Type locality: Tweed River, New South Wales.

Diagnosis

The single species of this subgenus in Australia. Distinguished from related *E. fumicatus* from New Guinea and Southeast Asia by frontal furrows only reaching to middle of eye.

Description

Measurements: Length: 2–2.2 mm; width: 0.85–0.9 mm; ratio width/length of pronotum: 1.4–1.44; ratio length/width of elytra: 1.36–1.43.

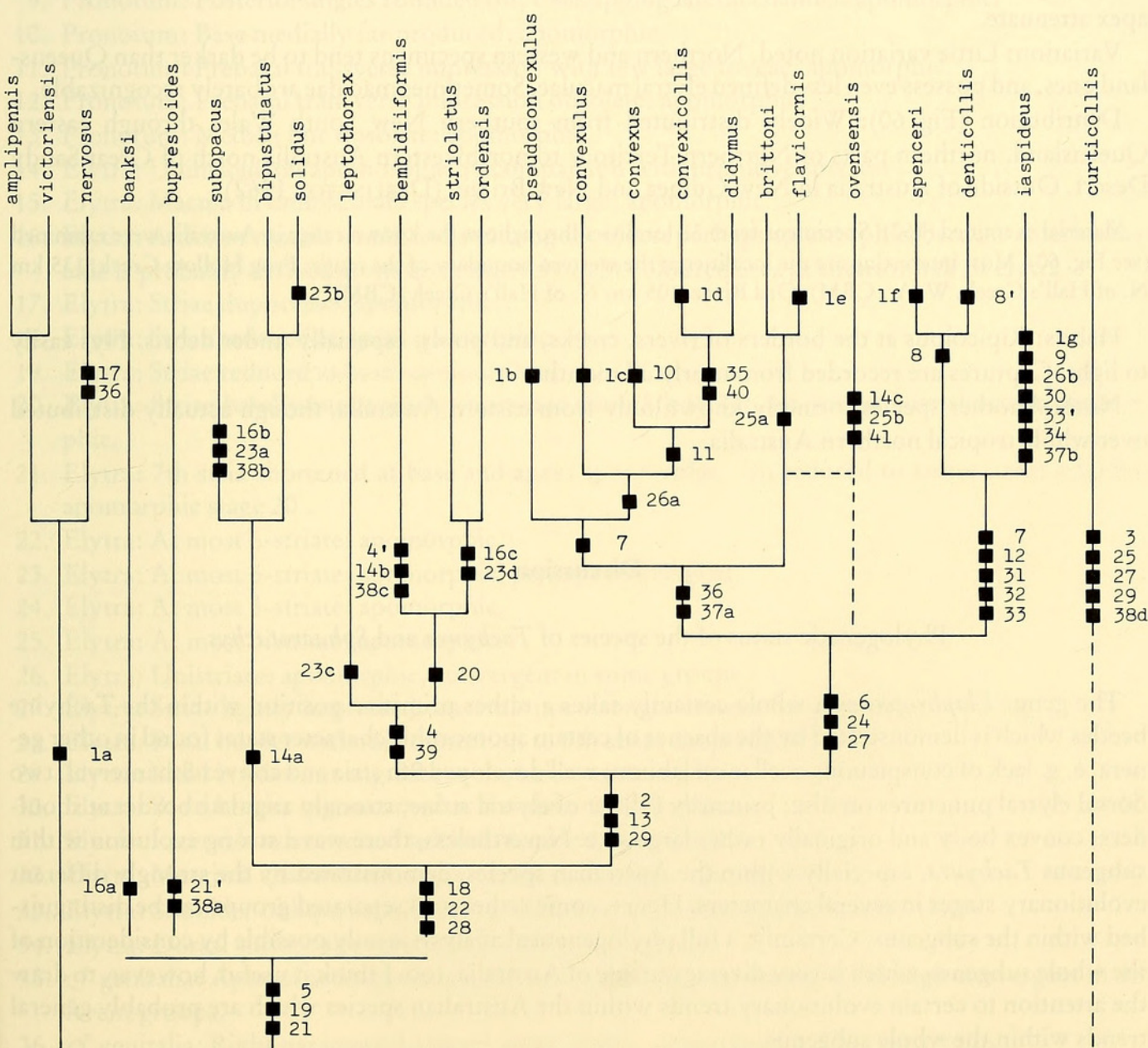


Fig. 61. Preliminary diagram of the supposed phylogenetic relationships of the Australian *Elaphropus* species. For explanation of character state numbers see text. a–g: character states of clear convergent origin. ': character state of increasing apomorphy. Dotted lines: Lineages not proved by reliable apomorphic character states.

Colour: Dark piceous to blackish, strongly iridescent. Two ill defined elytral maculae reddish. Anterior macula not attaining shoulder, medially attaining c. position of 4th stria. Posterior macula slightly more distinct, transverse, medially reaching to 2nd stria. Mouthparts infusate, 1st to 3rd segments of antennae, and legs dark yellow, terminal antennal segments dark. Lower surface piceous.

Head: Rather wide, frontal furrows straight, converging on clypeus, posteriorly attaining c. middle of eye. Eyes large, laterally far protruding. Surface irregularly microreticulate.

Pronotum: Rather wide, convex. Base as wide as apex. Apex straight, anterior angles completely rounded off. Sides anteriorly convex, posteriorly straight or even slightly concave. Posterior angles normal, slightly denticulate. Median line indistinct. Prebasal transverse impression widely interrupted in middle, laterally inconspicuously punctate. Surface densely, rather irregularly microsculptured.

Elytra: Wide, oval, convex. Shoulders rounded, sides regularly convex. Bistriate, 1st stria complete, 2nd shortedend at base and at apex. Striae superficially impressed, impunctate, intervals depressed. Basal border widely incurved, not angulate. Surface slightly transversely microreticulate, strongly iridescent.

Aedeagus (Fig. 46): Very short and high, with big, rounded apex. Both parameres 3-setose, left at apex attenuate.

Variation: Little variation noted. Northern and western specimens tend to be darker than Queensland ones, and possess even less defined elytral maculae. Sometimes maculae are barely recognizable.

Distribution (Fig. 60): Widely distributed from southern New South Wales through eastern Queensland, northern parts of Northern Territory to northwestern Australia north of Great Sandy Desert. Outside of Australia in New Guinea and New Britain (DARLINGTON 1962).

Material examined (162): Specimens from 38 localities throughout the known range in Australia were examined (see Fig. 60). Most interesting are the localities at the western boundary of the range: Frog Hollow Creek, 135 km N. of Hall's Creek, W. A. (CBM); Ord River, 105 km N. of Hall's Creek (CBM).

Habits: Ripicolous at the borders of rivers, creeks, and pools, especially under debris. Flies easily to light. Captures are recorded from nearly all months.

Note: Another species formerly known only from eastern Australia, though actually distributed over whole tropical northern Australia.

Discussion

Phylogenetic status of the species of *Tachyura* and *Sphaerotachys*

The genus *Elaphropus* as a whole certainly takes a rather primitive position within the Tachyine beetles which is demonstrated by the absence of certain apomorphic character states found in other genera, e. g. lack of conspicuous ocellae on labium; well developed 9th stria and convex 8th interval; two dorsal elytral punctures on disc; primarily full set of elytral striae; strongly angulate border at shoulders; convex body and originally rather large size. Nevertheless, there was a strong evolution within subgenus *Tachyura*, especially within the Australian species, demonstrated by the strongly different evolutionary stages in several characters. Hence, some rather well separated groups can be distinguished within the subgenus. Certainly, a full phylogenetical analysis is only possible by consideration of the whole subgenus which is very diverse outside of Australia, too. I think it useful, however, to draw the attention to certain evolutionary trends within the Australian species which are probably general trends within the whole subgenus.

The phylogenetical analysis is based on following characters. It must be stressed, however, that most character states are reductions rather than acquisitions of a more intricate status. Hence, convergent evolution of character states is possible and highly probable. For these reasons some general

trends, as for example reduction of size, are not used in this analysis, others must be recognized with great precaution.

Character states used:

1. Colour: Dark colour perhaps: plesiomorphic, reddish colour: apomorphic. Fading of colour certainly convergent in or within several groups.
2. Microsculpture: Reduction: apomorphic.
3. Head: Frontal furrows: Convergent furrows: apomorphic.
4. Pronotum: Base narrower than apex: apomorphic by comparison within group. In some species pronotum is extremely heartshaped.
5. Pronotum: Lateral carinae elongate: plesiomorphic.
6. Pronotum: Anterior angles not produced, rounded off: apomorphic.
7. Pronotum: Posterior angles removed from base by an incision: apomorphic.
8. Pronotum: Posterior angles dentiform: apomorphic, with a still more apomorphic state 8'.
9. Pronotum: Posterior angles rounded off, overlapping lateral channel: apomorphic.
10. Pronotum: Base medially far produced: apomorphic.
11. Pronotum: Prebasal transverse impression with few large foveae: apomorphic.
12. Pronotum: Prebasal transverse impression obsolete: apomorphic.
13. Pronotum: Median line obsolete: apomorphic.
14. Elytra: Unimaculate: apomorphic by comparison with primitive species.
15. Elytra: Macula in unimaculate species very large: apomorphic.
16. Elytra: Anterior macula small, not attaining shoulder: perhaps apomorphic, because anterior macula is probably derived from an extensively light coloured area at anterior half of elytra.
17. Elytra: Striae duplicated: apomorphic.
18. Elytra: Striae reduced at apex: apomorphic.
19. Elytra: Striae reduced at base: apomorphic.
20. Elytra: Striae basally successively shortened from 5th to 1st, 1st stria at base shortest: apomorphic.
21. Elytra: 7th stria shortened at base and apex: apomorphic, 7th reduced to traces only: a further apomorphic stage 20'.
22. Elytra: At most 6-striate: apomorphic.
23. Elytra: At most 5-striate: apomorphic, perhaps convergent.
24. Elytra: At most 3-striate: apomorphic.
25. Elytra: At most bistriate: apomorphic.
26. Elytra: Unistriate: apomorphic, convergent in some groups.
27. Elytra: Striae lightly impressed, intervals not strongly convex: apomorphic.
28. Elytra: Basal border without connection to 5th stria: apomorphic.
29. Elytra: Basal border not angulate at shoulder: apomorphic.
30. Elytra: Basal border not incurved at shoulder: apomorphic.
31. Elytra: Lateral border incised behind shoulder: apomorphic.
32. Elytra: Marginal channel interrupted behind shoulder: apomorphic.
33. Elytra: Shoulder oblique: apomorphic, with a still more apomorphic state 33'.
34. Elytra: Dorsal surface strongly depressed: apomorphic.
35. ♂ genitalia: Apex of aedeagus acute, projecting: perhaps apomorphic, though convergent in different groups.
36. ♂ genitalia: Right paramere 2-setose: apomorphic, convergent in different groups.
37. ♂ genitalis: Left paramere 2-setose: apomorphic.
38. ♂ genitalia: Left paramere thickened near apex: apomorphic, with 4 apparently convergent states 38a–38d.

39. ♂ genitalia: Apex of left paramere oblique: apomorphic.
40. ♂ genitalia: Apex of left paramere asymmetrically convex, setae fixed near lower edge of apex: apomorphic.
41. ♂ genitalia: Apex of both parameres lancet-shaped: apomorphic.

For the construction of a phylogenetic tree that species groups that share combinations of apomorphic states are treated as evolutionary units. In some primitive groups, however, monophyletic origin cannot be assured, as no obvious apomorphic character states have been discovered. Thus far, 8 groups are recognized, though phylogenetic relations between groups are not always evident.

Obviously there is a strong progression from primitive – *amplipennis*-, *banksi*-groups – to extremely derivative species – *convexus*-, *spenceri*-groups – with several intermediate stages. This is especially due to the various “trends” of character modification or of reduction, e. g. size reduction, reduction of microsculpture, of number and of length of elytral striae, of number of setae on parameres etc. Certainly, members of the *amplipennis*-group, belong to the most generalized *Tachyura*, even *Tachyura* beetles, whereas species of the *spenceri*-group are among the most derivative *Tachyura*.

Two rather peculiar trends show in several species a clear clinal succession from east to west. Western specimens of several widely distributed species tend to be smaller than eastern specimens, and in some bimaculate species pattern (especially with regard to anterior macula) is less well limited, and the ground colour tends to be lighter (*E. flavicornis*, *E. convexicollis*, *E. spenceri*, *E. iaspideus*, *E. curticollis*). That this is a general trend, is shown within the *convexus*-group, where the single species occurring in Western Australia, *E. convexicollis*, is light coloured and bears a rather indistinct pattern.

To what extent the evolution within *Tachyura* actually proceeded so linear, as pictured in the cladogram (Fig. 61), is questionable, because no extra-Australian species have been regarded. Nevertheless, the Australian fauna seems rather different from the Oriental *Tachyura*; hence, it may have been evolved quite independently.

Sphaerotachys may constitute the sister group of *Tachyura*. Because no common apomorphic character state for all *Tachyura* species has been discovered, however, *Tachyura* is more likely a paraphyletic assembly, and *Sphaerotachys* is perhaps more closely related to some of the more derivative groups within *Tachyura*. This question is at present not settled.

Zoogeography

Before attempting to draw zoogeographical conclusions from phylogentic status and from distribution, it is worth noting that the distribution of *Tachyura* species in Australia is far from being perfectly known. Virtually nothing, for example, is known from vast areas in interior Queensland, from most of Western Australia, especially from southwestern Australia, where no *Tachyura* or *Sphaerotachys* was thus far recorded. For these reasons, zoogeographical conclusions are by no means finalized.

The number of species occurring in the major regions is shown below:

South eastern Australia (southern Queensland to eastern Victoria)	12 species
Northeastern Queensland	15 species
Northern part of Northern Territory	17 species
Northwestern Australia north of Great Sandy Desert	13 species
Western Australia south of Great Sandy Desert	6 species
Central Australia including northernmost	
South Australia	3 species

There is a number of well differentiated distribution patterns which give a still better picture of the real distribution and diversity:

11 species range over the whole tropical north of Australia, from eastern Queensland through Northern Territory to northwestern Australia, 2 species enter also Central Australia.

3 species range from southeastern Queensland to northern parts of Northern Territory, without entering northwestern Australia.

3 species are restricted to northern parts of Northern Territory.

1 species occurs only in eastern Queensland.

2 species range from southeastern Queensland to eastern Victoria.

1 species is restricted to eastern Victoria.

2 species are confined to northwestern Australia north of Great Sandy Desert.

1 species occurs in Western Australia south of Great Sandy Desert and in Central Australia.

This distribution pattern clearly demonstrates: 1. Nearly half of the species are distributed over whole (wet) tropical northern Australia, there are few species, on the other hand, with limited ranges. 2. Evidently, southern Australia is extremely poor in *Tachyura* species. 3. The dry interior is also very poor in species, and only the two most common and most widely ranging species and an additional western "desert" species occur there.

By far most species are very widely distributed. Hence, in a vast area several species occur sympatrically. This leads to the question of the ecological innidation of the *Tachyura* species. In several places up to ten *Tachyura* species and *E. curticollis* have been collected. and they apparently occur together besides the edge of rivers or of standing pools. Theoretically, they should occupy slightly different niches. It seems very difficult to examine the habitat preferences without timeconsuming and accurate investigations. Nevertheless, I tried to get a general view over this question in two places in northwestern Australia, both at Ord River, where 10 or 11 species, respectively, have been recorded (*E. amplipennis*, *E. nervosus*, *E. banksi*, *E. buprestoides*, *E. bipustulatus*, *E. leptothorax*, *E. bembidiiformis*, *E. ordensis*, *E. flavicornis*, *E. convexicollis*, *E. spenceri*, *E. iaspideus*, *E. curticollis*). Both localities are rather homogenous, sandy river banks near channels and standing pools. Apparently all species, so far collected by hand, occur rather near to waters edge, only *E. curticollis* was found at some distance from open water under wet debris. The light coloured *E. amplipennis* and *E. nervosus* during daytime were captured slightly imbedded in fine sand. *E. buprestoides* and *E. spenceri* were captured while running on the river banks, while *E. bipustulatus* and *E. banksi* were mostly found under debris very near to the water, also within wet sand. Few specimens of *E. leptothorax* had been discovered among coarse sand. The other species at these localities were caught only at light, apparently they also live on or in the river banks.

As a conclusion, obvious ecological differences between most species do not seem to exist, though differences of size, colour and pattern point to slightly different habitat and/or food preferences.

Pattern of distribution shows that the *Tachyura* fauna in Australia is definitely a wet tropical fauna much like in other zoogeographical regions.

Since many species and species of most species-groups are widely distributed, analysis of phylogeny and distribution adds few to the knowledge of the faunal history. Obviously, the Australian *Tachyura* are by far most diverse in northern tropical Australia. As some of the most generalized *Tachyura* occur in Australia, the Australian fauna is perhaps very old and evolved presumably rather independently from the faunas of the other zoogeographical regions.

With exception of *E. victoriensis* which is perhaps merely a mountain race of *E. amplipennis*, the species of the most generalized species-groups are widely distributed throughout northern Australia. Species with restricted ranges exist only within the most derivative groups (*E. ovensensis*, *E. brittoni*, *E. didymus*, *E. denticollis*).

Some groups contain closely related sister species (e. g. *E. bipustulatus* - *E. solidus*, *E. striolatus* - *E. ordensis*, *E. flavicornis* - *E. brittoni*, *E. spenceri* - *E. denticollis*). In most cases the species are sympatric and one species is widely distributed, the other has a more restricted range. Only *E. striolatus*

— *E. ordensis* are allopatric and widely separated. The most complex situation exists within *convexus*-group, where 4 of the 5 closely related species occur in northeastern Queensland and are largely sympatric. The *convexus*-group seems at present to pass through a period of excessive sympatric evolution. However, the most similar species *E. convexus* and *E. didymus* are allopatric. *E. convexicollis* with the largest range is sympatric with all other species, but it is the single species to occur in Western Australia. As mentioned above, *E. convexicollis* is a species with a geographical clinal change of pattern.

The occurrence of several sister species within different groups is evidence of a rather recent evolutionary push within nearly all modern *Tachyura* species-groups in Australia. This push led to the formation of new species especially on the southern, northern, and western boundaries of the ranges of the groups. Hence, some geographically restricted species now exist in the northern and northwestern refugia (Arnhem Land, Kimberley Division), as well as in southeastern Australia.

Clinal changes in size, colour, and pattern from east to west across northern Australia, as well as evolution of several species with limited range in Northern Territory and northwestern Australia, is evidence of a former migration within several widely ranging species from northeastern Queensland to northern and northwestern Australia. In the course of that migration several species acquired the same light colour and indistinct pattern, regarded as apomorphic character states. The parallelism of clinal change is perhaps a consequence of the drier, less hospitable conditions met with in northwestern and western Australia (Gloger's rule). Assuming that these observations are true, they are evidence of the origin of most Australian *Tachyura* lineages in northeastern Australia rather than in northern or northwestern Australia, although the northern part of Northern Territory is today the region with the most diverse *Tachyura* fauna in Australia.

It seems very difficult to fix the evolutionary steps within *Tachyura* in terms of absolute time. However, within this subgenus some evolutionary events are recognizable, either leading to the formation of distinct species-groups, or to further speciation within groups, or to the differentiation of still very closely related sister species. Assumed, the most recent event, the formation of sister species, occurred within last glacial period, than the main speciation within larger species-groups may have occurred in mid Pleistocene or still earlier, and the differentiation of the species-groups occurred well before beginning of Pleistocene, presumably at different times in Pliocene. A comparable time table of evolutionary events was constructed by FREITAG (1979) for the northern species of genus *Cicindela*.

Rather homogenous ecological conditions in northern Australia during Pliocene are perhaps the reason, why species from nearly all species-groups are distributed over the whole of northern Australia. Presumably still a gene flow exists within the widespread species, as all species are very vagile and able to fly over rather wide distances. Moreover, at least during wet season, northern Australia from North Queensland to Kimberley Division has an fairly continuous system of water-bearing rivers, creeks, and flooded areas, which makes gene flow over this vast area possible. Nevertheless, the rather dry regions between the northern part of Northern Territory and the Kimberley Division in Western Australia seem to act as a barrier for some species widespread in Queensland and Northern Territory; and the Great Sandy Desert further southwest is a barrier for even more species. The Gulf of Carpentaria dry country barrier, however, apparently prevented the westward spreading of only one species (*E. convexus*), whereas several species occur in both, northern Queensland and Northern Territory. Perhaps such dry country barriers are more important for species evolved in mid Pleistocene or even more recently.

Hence, recent distribution of Australian *Tachyura* is the result of three different conditions in the past: 1. The homogenous conditions during Pliocene promoted spreading of several species over the whole tropical Australia. 2. Pleistocene dry country barriers (Gulf of Carpentaria corridor, northwestern Northern Territory corridor, Great Sandy Desert) prevented range spreading of younger species. 3. The formation of recent faunal refugia (Arnhem Land, Kimberley Division) promoted recent evolution of species with limited ranges.

The same phenomena have been found in several other Carabid groups, e. g. BAEHR (1985 a, b, 1986). Hence, high species diversity seems to be the rule in northern and northwestern ripicolous and open country inhabiting Carabids.

As a conclusion, the high species diversity of *Tachyura* in Australia must be stressed. The fauna is rich and diverse, partly because *Tachyura* contains several species-groups with extremely different evolutionary levels. A large number of species is sympatric and occurs actually at the same locality, especially in northern and northwestern Australia, although favourable habitats are much rarer there than in eastern Australia. Within the derivative species-groups evolution is still going on, and it is primarily the refugia of the north and northwest, where new species evolve. This is also the key to the high species diversity in Northern Territory and northwestern Australia.

References

- ANDREWES, H. E. 1925: A revision of the Oriental species of the genus *Tachys*. — Ann. Mus. civ. Stor. nat. Genova **51**: 327–502
- BAEHR, M. 1985 a: Revision of the Australian Zuphiinae 3. The genus *Pseudaptinus* Castelnau (Insecta, Coleoptera, Carabidae). — Spixiana **8**: 33–57
- 1985 b: Revision of the Australian Zuphiinae 4. The genus *Parazuphium* Jeannel (Insecta, Coleoptera, Carabidae). — Spixiana **8**: 295–321
- 1986: Revision of the Australian ground-beetle genus *Porocara* Sloane (Insecta, Coleoptera, Carabidae, Odacanthinae). — Aust. J. Zool. **34**: in press
- BLACKBURN, T. 1891: Notes on Australian Coleoptera, with descriptions of new species, part IX. — Proc. Linn. Soc. New South Wales **5**: 775–790
- 1894: Further notes on Australian Coleoptera, with descriptions of new genera and species, part XV. — Trans. Roy. Soc. South Australia **18**: 139–168
- CSIKI, E. 1929: Coleopterorum Catalogus. Carabidae. Pars 98
- DARLINGTON, P. J. Jr. 1962: The Carabid beetles of New Guinea I. Cicindelinae, Carabinae, Harpalinae through Pterostichinae. — Bull. Mus. Comp. Zool. Harvard **126** (3): 321–564
- 1963: Australian Carabid beetles XII. More *Tachys*. — Psyche, Cambridge **70**: 22–33
- ERWIN, T. L. 1974: Studies of the subtribe Tachyina (Coleoptera: Carabidae: Bembidiini). Supplement A: Lectotype designations for New World species, two new genera, and notes on generic concepts. — Proc. Ent. Soc. Washington **76**: 123–155
- FREITAG, R. 1979: Reclassification, phylogeny and zoogeography of the Australian species of *Cicindela* (Coleoptera: Cicindelidae). — Aust. J. Zool. Suppl. **66**: 1–99
- JORDAN, K. 1894: New species of Coleoptera from the Indo- and Austro-Malayan Region. — Nov. Zool. **1**: 104–122
- MACLEAY, W. 1871: Note on a collection of insects of Gayndah. — Trans. Ent. Soc. New South Wales **2** (1867–1873): 79–205
- SLOANE, T. G. 1896 a: Carabidae. Report on the work of the Horn Scientific Expedition to Central Australia. Part 2. Zoology: 380–384
- 1896 b: On the Australian Bembidiines referable to the genus *Tachys*, with a description of a new allied genus *Pyrrhotachys*. — Proc. Linn. Soc. New South Wales **21**: 355–377
- 1903: Studies in Australian entomology XII. New Carabidae. — Proc. Linn. Soc. New South Wales **28**: 566–642
- 1921: Revisional notes on Australian Carabidae. Part VI. Tribe Bembidiini. — Proc. Linn. Soc. New South Wales, **46**: 192–208

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