

THE RHAPHIDOPHORIDAE (Orthoptera) OF AUSTRALIA, 1: TASMANIA

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Abstract: A new genus *Micropathus* n. gen. is erected, and 2 new species, *M. tasmaniensis* n. sp. and *M. cavernicola* n. sp., are described. These species comprise the total known rhabdiphorid fauna from Tasmania.

The family Rhabdiphoridae appears to have been overlooked in the study of Australian orthopterous insects. Up till the present, only 2 papers have been published on the group and 3 species described. In 1934, Karny described an immature specimen from the Dandenong Ranges in Victoria and tentatively placed it in the genus *Pachyrhamma* Walker as *P. chopardi* Karny. In 1944, Chopard erected the new genus *Speleotettix* and placed in it 2 new species, *S. tindalei* Chopard collected from a cave in South Australia, and *S. flindersensis* Chopard collected from a cave on Flinders Island.

This is the first in a series of papers on the Rhabdiphoridae of Australia. It contains descriptions of 2 new species belonging to the genus *Micropathus* n. gen., *M. tasmaniensis* n. sp. and *M. cavernicola* n. sp. respectively. These 2 species occur abundantly in caves, and comprise the total known rhabdiphorid fauna from Tasmania. *M. tasmaniensis* is found in the SE part of Tasmania, and *M. cavernicola* in the N. and W. parts of the island. There appears to be no overlap in their distribution. The 2 species are quite distinct, although closely related. The lack of speciation among the cave Rhabdiphoridae in Tasmania is strange and can perhaps be attributed to lack of suitable ecological niches. So far no specimens have been collected from the bush, and it is possible that a greater diversity of species may occur there than are present in the limestone caves.

Genus *Micropathus* Richards, n. gen.

Body clothed with numerous short setae. Legs long and slender. Antennae very long and tapering, almost touching at their bases; scape about 3× as large as pedicel, which is narrower than scape, but broader than other segments; from segment 4 onwards segments subequal in length, although steadily decreasing in size; all segments thickly clothed with short setae. A single, anterior, median ocellus only. Fastigium rising very abruptly, convex, grooved medianly and longitudinally. Pronotum and mesonotum margined laterally. Fore coxa armed with a retrolateral spine. All femora sulcate ventrally. Apical spines on femora, tibiae, proximal segments 1 & 2 of hind tarsi constant in number. Fore femur bears 2 apical spines beneath, 1 prolateral and 1 retrolateral; fore tibia bears 4 apical spines, 1 above and 1 beneath both prolaterally and retrolaterally; fore tarsus unarmed.

Mid femur bears 2 apical spines beneath, 1 prolateral and the other retrolateral; mid tibia bears 4 apical spines, 1 above and 1 beneath both prolaterally and retrolaterally; mid tarsus unarmed. Hind femur unarmed; hind tibia bears a pair of long apical spurs above, a pair of subapical spines above, a pair of short apical spurs beneath and a pair of subapical spines beneath, 1 from each pair being prolateral and the other retrolateral; 2 proximal segments of hind tarsus each bears 2 apical spines above, 1 prolateral and one retrolateral; the other 2 segments unarmed. Subgenital plate of ♀ with distal margin split medianly and produced as 2 lobes. Subgenital plate of ♂ wider than long, distal margin rounded; lateromedianly it bears 2 short, conical styli, 1 to each side. Ovipositor with dorsal valves becoming attenuated towards tip, apex acute and weakly upturned, ventral valves weakly armed with several small teeth gradually decreasing in size towards apex.

Type species: *Micropathus tasmaniensis* n. sp.

***Micropathus tasmaniensis* Richards, n. sp.** Fig. 1.

Color: Basic color pale brown with pronotum, mesonotum, metanotum and abdominal terga irregularly mottled with mid brown and ochreous; femora, fore and mid tibiae banded or mottled with pale brown and ochreous; hind tibiae and all tarsi ochreous; antennae pale brown; ovipositor pale reddish brown.

Body: Length up to 18 mm in ♂ and 20 mm in ♀; average length 17–18 mm. Dorsal surface of body sparsely clothed with setae; ventral surface thickly clothed with setae. Antennae broken. Fastigium as high as long. Maxillary palps with segments 3 & 4 subequal in length. Ovipositor 0.65 length of body; ventral valves weakly armed distally, 0.2 of total length to apex with 6 or 7 small teeth gradually decreasing in size towards apex. *Antennae*: As in generic description. Segment 3 on dorsal aspect 1.7× as long as pedicel, and on ventral aspect 1.3× as long as pedicel in both ♂ and ♀. Sexual dimorphism absent. No spines present on flagellum of either ♂ or ♀. *Legs*: Fore and mid legs subequal in length, with hind leg 1.5 length of fore and mid legs. Sexual dimorphism absent. Tibiae and proximal 2 segments of hind tarsi armed with variable numbers of linear spines (tab. 2). No spines occur on fore, mid or hind femora and fore or mid tarsi. Apical spines constant in number as in generic description. Length of proximal segment of hind tarsus subequal with other 3 segments together. Ratio of length of legs to length of body: fore leg 1.8 : 1; mid leg 1.8 : 1; hind leg 2.9 : 1. All legs thickly clothed with short setae. *Genitalia*: ♀. Suranal plate, fig. 1a (SAP), convex laterally, distal margin rounded usually, but occasionally truncate or emarginate; distal margin thickly clothed with setae, rest of plate sparsely clothed with setae. Subgenital plate, fig. 1b (SGP), concave laterally, tapering to distal apex which is produced as 2 narrow lobes 0.6 total length of plate; a median groove extends between the 2 lobes; each lobe is rounded at its apex; lateral areas of plate clothed with setae. ♂: Suranal plate, fig. 1c (SPL), convex laterally, distal margin rounded and curved under ventrally bearing 2 anteriorly directed processes; whole plate thickly clothed with setae. Subgenital plate, fig. 1d (H), approximately 2× as wide as long, convex laterally, latero-distal margins rounded; disto-medianly the plate is produced into a lobe with a rounded apex; plate thickly clothed with setae. Two styli, fig. 1d (S), short, broad, conical, thickly clothed with setae, length of styli being 0.6 length of sternite IX (S IX). Parameres, fig. 1e (P), elongate, rounded

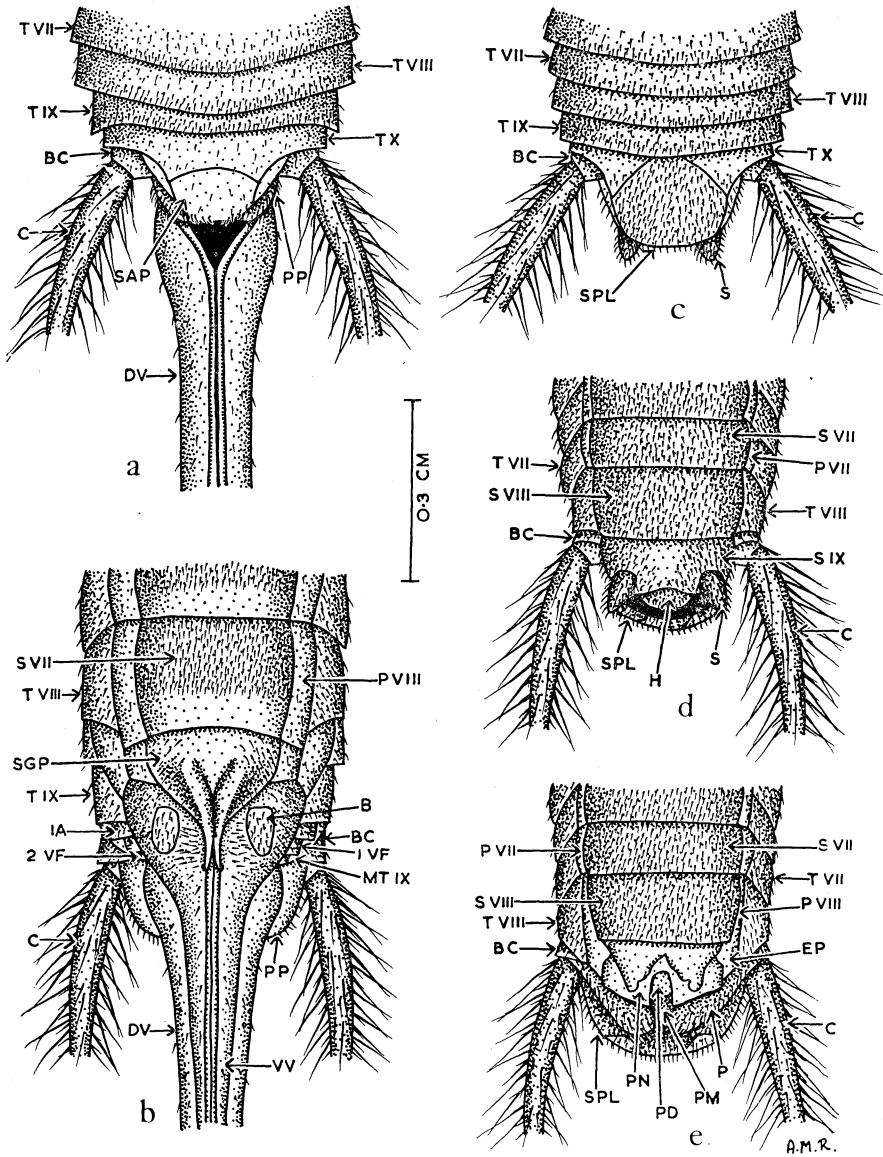


Fig. 1. *Micropathus tasmaniensis* n. sp. a, ♀ genitalia, dorsal view; b, ♀ genitalia, ventral view; c, ♂ genitalia, dorsal view; d, ♂ genitalia, ventral view; e, ♂ genitalia, ventral view, subgenital plate removed to expose structures beneath.

at apex, 4× longer than wide, prolateral and distal margins thickly clothed with setae. Pseudosternite, fig. 1e (PD), 2.2 wider than long, with distal margin rounded; completely covered by penis. Penis, fig. 1e (PN), 2-lobed, each lobe subequal in width to length; each lobe consists of a solid triangular-shaped lobe overlying a larger membranous lobe. Paraprocts absent.

Locality: Limestone cave, Florentine Valley, Tasmania (type locality), 1961, G. Dolezal; Wolff Hole Cave, Hastings, Tasmania, 1957, A. Goede; limestone cave, Hastings area, Tasmania, 1957, Goede; Newdegate Cave, Hastings, Tasmania, 1950, E. Smith & K. S. Tredall; Entrance Cave, Ida Bay, Tasmania, 1962, Dolezal.

Holotype ♂, allotype ♀ and 2 paratypes (♂, ♀), in Australian National Insect Collection, C.S.I.R.O., Canberra. Two paratypes (♂, ♀) in Australian Museum, Sydney.

Table 1. Variability in number of linear spines on the legs of 25 specimens of *Micropathus tasmaniensis* n. sp.

		Arith. Mean		No. of Specimens		Std. Dev.		Range (or distribution)	
		L	R	L	R	L	R	L	R
Fore Femur Inf.	Pro.	0	0	25	24	0	0	0	0
	Retro.	0	0	25	24	0	0	0	0
Fore Tibia Inf.	Pro.	4	4	25	24	-	-	4(24), 5(1)	4(23), 5(1)
	Retro.	4	4	25	24	-	0	4(24), 3(1)	4
Fore Tarsus	Pro.	0	0	25	24	0	0	0	0
	Retro.	0	0	25	24	0	0	0	0
Mid Femur Inf.	Pro.	0	0	25	22	0	0	0	0
	Retro.	0	0	25	22	0	0	0	0
Mid Tibia Sup.	Pro.	0	0	25	22	0	0	0	0
	Retro.	0	0	25	22	0	0	0	0
Mid Tibia Inf.	Pro.	4	4	25	22	-	-	4(24), 5(1)	4(21), 5(1)
	Retro.	4	4	25	22	-	-	4(23), 3(2)	4(21), 3(1)
Mid Tarsus	Pro.	0	0	25	22	0	0	0	0
	Retro.	0	0	25	22	0	0	0	0
Hind Femur Inf.	Pro.	0	0	25	20	0	0	0	0
	Retro.	0	0	25	20	0	0	0	0
Hind Tibia Sup.	Pro.	31.6	30.5	25	20	4.5	3.4	23-40	25-38
	Retro.	34.6	32.4	25	20	4.1	3.9	27-41	26-39
Hind Tarsus 1 Sup.	Pro.	1.7	1.4	24	20	0.5	0.5	1-3	1(11), 2(9)
	Retro.	1.9	1.8	24	20	0.4	0.5	1-3	1-3
Hind Tarsus 2 Sup.	Pro.	1	1.1	24	20	0.5	0.4	0-2	0-2
	Retro.	1	1.2	24	20	-	0.5	1(22), 2(2)	1(16), 2(4)

(Figures in parentheses represent number of specimens).

***Micropathus cavernicola* Richards, n. sp.** Fig. 2.

Color: Basic color pale brown, with pronotum, mesonotum, metanotum and abdominal terga irregularly mottled with mid brown and ochreous; femora and tibiae banded or mottled with pale brown and ochreous; tarsi ochreous; antennae pale brown; ovipositor pale reddish brown.

Body: Length up to 19 mm in ♂ and 20 mm in ♀; average length 17-18 mm. Dorsal surface of body sparsely clothed with setae; ventral surface thickly clothed with setae,

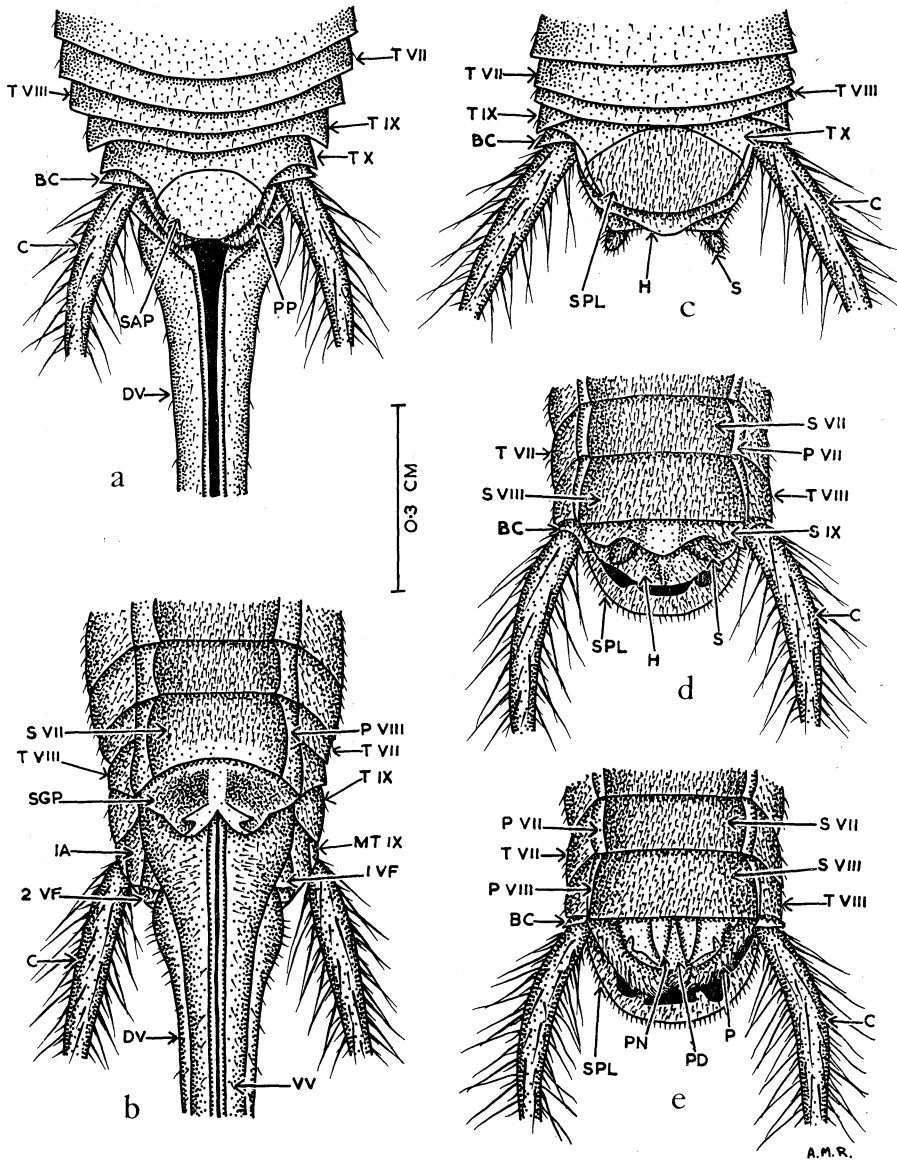


Fig. 2. *Micropathus cavernicola* n. sp. a, ♀ genitalia, dorsal view; b, ♀ genitalia, ventral view; c, ♂ genitalia, dorsal view; d, ♂ genitalia, ventral view; e, ♂ genitalia, ventral view, subgenital plate removed to expose structures beneath.

Antennae broken. Fastigium as high as long. Maxillary palps with segments 3 & 4 subequal in length. Ovipositor 0.6 length of body; ventral valves weakly armed distally 0.2 of total length to apex with 6 small teeth gradually decreasing in size towards apex. *Antennae*: As in generic description. Segment 3 on both dorsal and ventral aspects 1.6× as long as pedicel in both ♂ and ♀. Sexual dimorphism absent. No spines present on

Table 2. Variability in number of linear spines on the legs of 18 specimens of *Micropathus cavernicola* n. sp.

		Arith. Mean		No. of Specimens		Std. Dev.		Range (or distribution)	
		L	R	L	R	L	R	L	R
Fore Femur Inf.	Pro.	0	0	18	18	0	0	0	0
	Retro.	0	0	18	18	0	0	0	0
Fore Tibia Inf.	Pro.	4	4	18	18	-	-	4(15), 5(2), 3(1)	4(16), 5(2)
	Retro.	3.8	4	18	18	0.7	0	1-5	4
Fore Tarsus	Pro.	0	0	18	18	0	0	0	0
	Retro.	0	0	18	18	0	0	0	0
Mid Femur Inf.	Pro.	0	0	18	18	0	0	0	0
	Retro.	0	0	18	18	0	0	0	0
Mid Tibia Sup.	Pro.	0	0	18	18	0	0	0	0
	Retro.	0	0	18	18	0	0	0	0
Mid Tibia Inf.	Pro.	4	4	18	18	-	0	4(15), 5(3)	4
	Retro.	4	4	18	18	-	-	4(17), 5(1)	4(17), 3(1)
Mid Tarsus	Pro.	0	0	18	18	0	0	0	0
	Retro.	0	0	18	18	0	0	0	0
Hind Femur Inf.	Pro.	1.5	1.8	18	10	0.6	1.2	1-3	0-4
	Retro.	0	0	18	10	0	0	0	0
Hind Tibia Sup.	Pro.	33.8	33.9	18	10	3.0	3.3	29-40	28-39
	Retro.	37.6	36.6	18	10	3.5	3.1	31-45	32-41
Hind Tarsus 1 Sup.	Pro.	1.6	2	17	10	0.5	-	2(11), 1(6)	2(10), 1(1)
	Retro.	1.4	1.8	17	10	0.5	0.7	2(7), 1(10)	1-3
Hind Tarsus 2 Sup.	Pro.	1.4	1.3	17	10	0.5	0.5	2(7), 1(10)	2(4), 1(7)
	Retro.	1.3	1.4	17	10	0.4	0.5	2(5), 1(12)	2(5), 1(6)

(Figures in parentheses represent number of specimens).

flagellum of either ♂ or ♀. *Legs*: Fore and mid legs subequal in length, with hind leg 1.6 length of fore and mid legs. Sexual dimorphism absent. Hind femora, all tibiae and proximal 2 segments of hind tarsi armed with variable numbers of linear spines (tab. 2). No spines occur on fore or mid femora or tarsi. Apical spines constant in number as in generic description, except that hind femur occasionally bears a proteral apical spine. Length of proximal segment of hind tarsus subequal with other 3 segments together. Ratio of length of legs to length of body: fore leg 2 : 1; mid leg 2 : 1; hind leg 3.1 : 1. All legs thickly clothed with short setae. *Genitalia*: ♀: Suranal plate, fig. 2a (SAP), convex laterally, rounded distally; latero-distal margin clothed with 2 groups of setae; rest of plate sparsely clothed with setae. Subgenital plate, fig. 2b (SGP), lateral margin convex, but indented medianly; distal margin rounded, but deeply notched medianly with the plate folded back dorsally into 2 small lobes, 1 on either side; medianly the plate is slightly keeled; lateral areas of plate clothed with setae. ♂: Suranal plate, fig. 2c (SPL), rounded laterally and distally; distal margin curved under ventrally and bearing 4 spines which help keep the distal margins of suranal and subgenital plates closely together; whole

plate thickly clothed with setae. Subgenital plate, fig. 2d (H), 2.5 wider than long, distal margin rounded; medianly the plate is slightly keeled. Two styli, fig. 2d (S), short, broad, conical, thickly clothed with setae, length of styli being 0.4 length of sternite IX (S IX). Parameres, fig. 2e (P), elongate, rounded at apex, 4× longer than wide, prolateral and distal margins thickly clothed with setae. Pseudosternite, fig. 2e (PD), 2× as wide as long, with distal margin rounded. Penis, fig. 2e (PN), 2 lobed, each lobe 1.3 wider than long; each lobe consists of a solid tapering lobe overlying a larger membranous lobe with an indented distal margin. Paraprocts absent.

Locality: Maracoopa Cave, Mole Creek, Tasmania (type locality), 1957, A. Goede; Mole Creek caves, Tasmania, 1901, A. M. Lea; limestone cave, Franklin River near its junction with the Gordon River, Tasmania, 1962, R. Scott.

Holotype ♂, allotype ♀, and 2 paratypes (♂, ♀), in National Insect Collection, C.S. I.R.O., Canberra. Two paratypes (♂, ♀), in Australian Museum, Sydney. Two paratypes (2♀ ♀) in the South Australian Museum, Adelaide.

Micropathus cavernicola differs from *M. tasmaniensis* in: 1, occurrence of prolateral linear spines on hind femora; 2, shape of subgenital plate of ♀; 3, presence of 4 spines on suranal plate of ♂; 4, subgenital plate of ♂ slightly keeled.

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Arith. Mean—Arithmetic mean.	Inf.—Inferior.
L.—Left leg.	Mid.—Middle.
Pro.—Prolateral.	R.—Right leg.
Retro.—Retrolateral.	Sup.—Superior.
Std. Dev.—Standard Deviation.	

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B—Basivalvula.	PN—Penis.
BC—Basal segment of cercus.	PP—Paraproct.
C—Cercus.	S—Stylus.
DV—Dorsal valve.	S VII, S VIII, S IX—Sternite VII, VIII, IX.
EP—Endoparamere.	SAP—Suranal plate, ♀.
H—Subgenital plate, ♂.	SGP—Subgenital plate, ♀.
IA—Intersegmental apodeme.	SPL—Suranal plate, ♂.
MT IX—Membrane of tergite IX.	T VII, T VIII, T IX, T X—Tergite VII, VIII, IX, X.
P—Paramere (ectoparamere).	1 VF—1st valvifer.
P VII, P VIII—Pleurite VII, VIII.	2 VF—2nd valvifer.
PD—Pseudosternite.	VV—Ventral valve.
PM—Perianal membrane.	