

**A description of four new species of the genus *Pachypaederus* Fagel from South Africa
with a key to southern African species (Coleoptera: Staphylinidae: Paederinae)**

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Abstract. The following four new species of the genus *Pachypaederus* Fagel, 1958 are described and illustrated: *P. opacinus* sp. nov., *P. sarkae* sp. nov., and *P. triangulipennis* sp. nov. from KwaZulu-Natal Province, South Africa and *P. pretoriensis* sp. nov. from Pretoria, South Africa. Male sexual characters of *P. newtoni* (Last, 1950) are described and illustrated. Additional records and key to *Pachypaederus* species of southern Africa are presented.

INTRODUCTION

The genus *Pachypaederus* Fagel, 1958 includes moderately to very large species of the subtribe Paederina. The detailed description was published by Fagel (1958).

The hitherto known distribution of the genus *Pachypaederus* in South Africa is limited to north-eastern and central regions - provinces: Mpumalanga, Limpopo, Gauteng, KwaZulu-Natal and Eastern Cape Province. One species was described from Swaziland (Fig. 74).

Monophyly of the genus *Pachypaederus* was checked and confirmed by Li & Zhou (2009).

MATERIAL AND METHODS

Dry-mounted specimens were studied under binocular stereomicroscope MBS 10. Measurements were taken with the above mentioned microscope using an ocular scale. The labels of type specimens are given in their original version, the labels of other specimens are given in simplified way.

The following abbreviations are used to indicate the depository of specimens:

- DMSA collection of Durban Natural Science Museum, Durban, South Africa;
JJRC private collection of Jiří Janák, Rtyně nad Bílinou, Czech Republic;
NMSA collection of KwaZulu-Natal Museum, Pietermaritzburg, South Africa;
TMSA collection of Ditsong National Museum of Natural History (formerly Transvaal Museum), Pretoria, South Africa;
SANC collection of South African National Collection of Insects, Pretoria, South Africa.

Abbreviations: n- number of specimens measured, L- length, W- width, M- arithmetic mean, R- ratio, HT- holotype, PT- paratype.

TAXONOMY

Pachypaederus Fagel, 1958

Type species: *Paederus crassus* Boheman, 1848

Description: Fagel (1958: 70)

Geographical distribution and diversity: eastern part of Palearctic region and Oriental region (2 species), Africa south of Sahara (20 species described in previous papers + 4 species described in this paper), Madagascar (1 species) (Fagel 1958, 1959, 1960 a, b, 1961 a, b, 1965, Janák 1998, Willers 2002, 2003).

Distinctive characters in the Subtribe Paederina: Mentum simple, not modified, without granules or dents (x *Allopaederus* Fagel, 1958 and *Madecapaederus* Fagel, 1958), prosternum with keeled intercoxal process (x *Oreopaederus* Fagel, 1958, *Paederus* Fabricius, 1775 and *Paederidus* Mulsant et Rey, 1877, cf. Figs 37, 38), gular grooves strongly approximate and in considerable part parallel (x *Paederus* Fabricius, 1775 and *Paederidus* Mulsant et Rey, 1877, cf. Figs 33-36), lateral sides of abdomen with pleurites (x *Madecapaederus* Fagel, 1958), sternite III with high elevated longitudinal keel (x *Paederidus* Mulsant et Rey, 1877).

Discussion. Some species are very similar externally and can be determined with certainty without comparison to correctly determined specimens only, with the use of the aedeagus and its internal structures in males and of the shape and structure of sternite IX in females, as the basal half of sternite IX shows different types of vaulting and depressions (cf. Figs 47, 52, 56, 60, 64, 68). The last character is described in this paper for a few species only due to insufficient material of other species.

DESCRIPTION

Pachypaederus opacinus sp. nov.

(Figs 1, 2, 6, 7, 64-67)

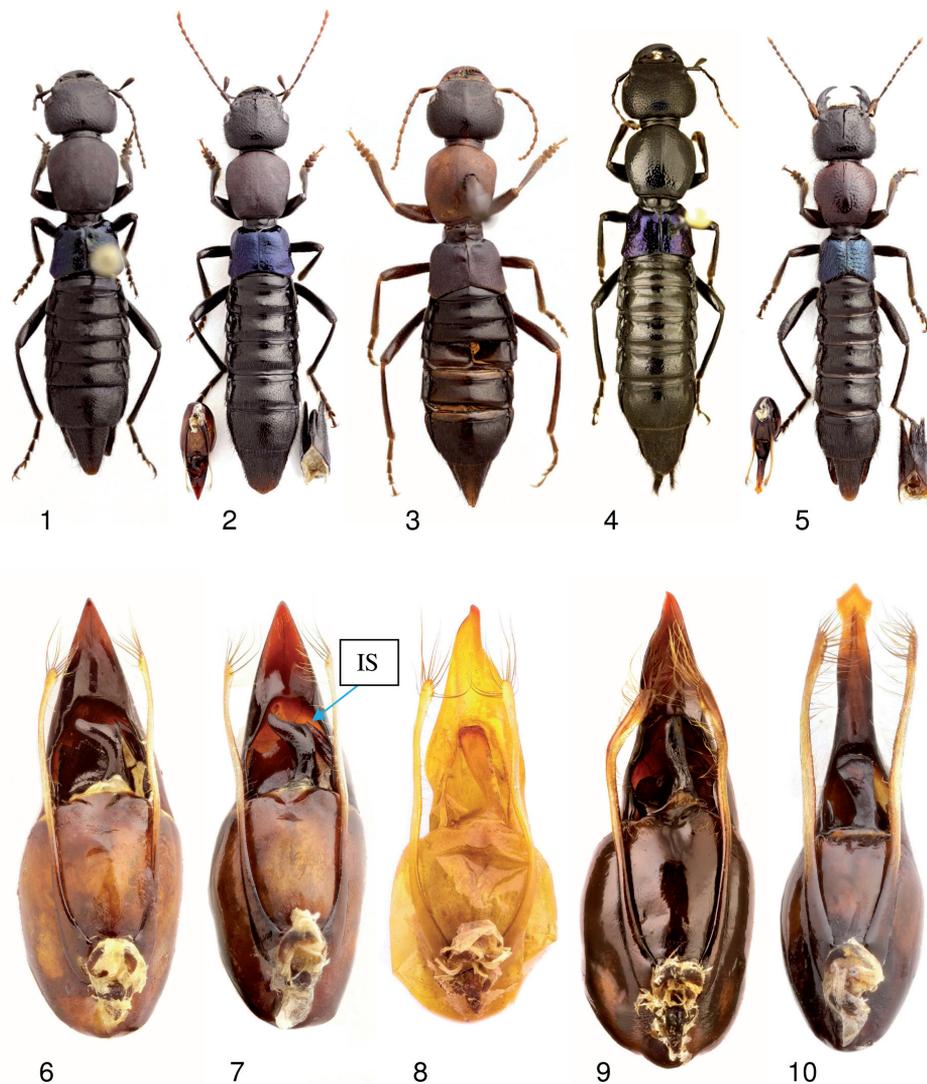
Type locality. South Africa, KwaZulu-Natal province, Karkloof.

Type material. Holotype (♂): „S. Afr; Natal Middl., Karkloof for. 1300 m, 29.18 S – 30.13 E / 5. 12. 1989; E-Y: 2745, sifted forest litter, Endrödy & Klimaszew.“, (TMSA). Paratypes: (1 ♀): same data as holotype, (JRPC); (1 ♂, ♀): „S. Afr.: Natal Middl., Northington, 1420 m, 29.28 S – 30.01 E / 12.12.1989; E-Y: 2764, sifted forest litt., Endrödy & Klimaszew.“, (TMSA); (1 ♀): „SOUTH AFRICA: Natal, Karkloof: Geekies Farm, B. Stuckenberg + J. G. H. Londt, 6.xii.1978“, (TMSA); (1 ♀): „South Africa, KwaZulu-Natal, Howick, Karkloof Range, 1325m, 29°19.1'S 30°15.5'E, 23.xi.2006, J. Janák leg.“, (JRPC); (1 ♂, 3 ♀♀): „South Africa, KwaZulu-Natal, Howick, Mt Gilboa, 1650-1700m, 29°17'S, 30°17'E, indig. forest, 29.xi.2009, beating, J. Janák lgt.“, (JRPC).

Description (n = 10). Body length 17.7-19.8 mm (M = 18.5 mm, HT = 19.0 mm), forebody length 8.7-9.7 mm (M = 9.1 mm, HT = 9.5 mm). Black, pronotum dark reddish-brown, elytra

blue, legs, antennae and mouthparts black, tarsi, antennae and palpi brown, second segment, basal and apical part of antennomere 1, 3, 4 and antennomeres 5-11 and last segment of maxillary palpi reddish (Figs 1, 2).

Head rounded trapezoidal, slightly convex, nearly a quarter wider than long ($R = 1.14-1.24$, $M = 1.19$, $HT = 3.22/2.64 = 1.22$). Eyes small, temples about twice as long as eyes ($R = 1.86-2.50$, $M = 2.18$, $HT = 2.46$), distinctly narrowed behind, posterior angles largely rounded, base not emarginate. Surface, except for unpunctured midanterior region and narrow median



Figs 1-10. 1, 2, 6, 7- *P. opacinus* sp. nov., HT, PT; 3, 8- *P. pretoriensis* sp. nov., HT; 4, 9- *P. sarkae* sp. nov., HT; 5, 10- *P. triangulipenis* sp. nov., HT; 1-5: habitus, 6-10 aedeagus. IS- internal structure.

strip, moderately and coarsely punctured, interstices between punctures about two times as large as diameter of puncture. Head except of anterior part of frons with very fine and dense isodiametric microsculpture. Labrum in the middle slightly emarginate, median tooth small and not extended. Antennae long, all segments distinctly longer than wide, fifth segment more than twice as long as wide ($L/W = 2.04-2.90$, $M = 2.47$, $HT = 2.50$), tenth segment twice as long as wide ($L/W = 1.71-2.25$, $M = 1.93$, $HT = 2.21$).

Pronotum rounded trapezoidal, moderately convex transversally, slightly longer as wide ($L/W = 1.06-1.11$, $M = 1.08$, $HT = 3.34/3.16 = 1.06$) and as wide as head ($R = 0.96-1.03$, $M = 0.99$, $HT = 3.16/3.22 = 0.98$). Surface sparsely and very finely punctured, slightly sparser and distinctly coarser than on head. Median furrow in posterior quarter short. Pronotum dull, with dense and deep isodiametric microsculpture.

Elytra trapezoidal, flattened along suture, distinctly transverse ($R = 0.75-0.82$, $M = 0.77$, $HT = 2.52/3.37 = 0.75$), with oblique, slightly rounded humeri and straight or very slightly emarginate lateral sides. Surface finely and sparsely punctured, with hardly visible traces of oblique microstriae.

Abdomen slightly widened to segment VII, very finely and moderately sparsely punctured, basal impression of tergites III-V distinctly unpunctured. Surface with very fine microsculpture consisting of narrow transverse mesh.

Male. Sternites III-VI without modifications, sternite VII in posterior two thirds with narrow unpunctured area in the middle, sternite VIII narrowly and deeply emarginate in posterior half, tergite X pointed apically, and sternite IX truncate apically.

Aedeagus (Figs 6, 7) 4.7-4.9 mm long ($n = 4$, $M = 4.8$ mm, $HT = 4.8$ mm), with regularly apically narrowed median lobe. Internal structure (see Fig. 7) widened and turned left apically.

Female. Sternite VIII with shallow apico-lateral emarginations, and widely rounded apex (Figs 66, 67). Sternite IX wide, with deep rounded depression in the middle of basal third and truncate or slightly emarginate apex (Figs 64, 65).

Comparative notes. *Pachypaederus opacinus* sp. nov. differs from others Afrotropical *Pachypaederus* species by its completely dull pronotum, very slightly shiny head in contrast to shiny elytra and in the aedeagus shape and internal structure.

Etymology. The new species is named after the dull forebody (Lat. *opacinus* = dull).

Distribution. The new species is known from three localities in KwaZulu-Natal Province, South Africa only: Karkloof forest, Mt. Gilboa and Northington forest.

Bionomics. *P. opacinus* sp. nov. occurs in forests and was collected by sifting and beating in November and December.

***Pachypaederus pretoriensis* sp. nov.**

(Figs 3, 8)

Type locality. South Africa, Gauteng province, Pretoria.

Type material. Holotype (♂): „PTA [= Pretoria], Jan 67, A. v. Z. [lgt.]“, (TMSA).

Description (HT, slightly teneral). Body length 21.0 mm, forebody length 10.8 mm. Black, pronotum reddish, elytra brown, legs and mouthparts brown, antennae light reddish-brown, apical parts of antennomeres 1-6 dark brown (Fig. 3).

Head rounded, slightly convex, a quarter wider than long ($3.63/2.98 = 1.22$). Eyes small, temples about thrice as long as eyes ($R = 3.30$), distinctly rounded, posterior angles almost indistinct, widely rounded. Surface, except for unpunctured narrow middle line and moderately large transverse unpunctured area of frons, moderately sparsely and finely punctured, interstices between punctures about twice as large as diameter of puncture. Head dull, all surface except for very narrow line between eyes with very dense isodiametrical microsculpture. Labrum in middle slightly emarginate, median tooth small, but extended anteriorly. Antennae moderately long, all segments distinctly longer than wide, fifth segment distinctly more than twice as long as wide ($L/W = 2.35$), tenth segment slightly more than twice as long as wide ($L/W = 2.18$).

Pronotum rounded trapezoidal, moderately convex transversally, slightly longer than wide ($3.68/3.33 = 1.10$) and slightly narrower than head ($3.33/3.63 = 0.92$). Anterior angles rounded, sides narrowed posteriorly, in anterior third slightly emarginate. Surface very sparsely and very finely punctured, distinctly more sparsely and finely than on head. Median furrow in posterior half distinct, extending to posterior one seventh. Pronotum dull, all surface with very dense isodiametrical microsculpture similar to that on head.

Elytra trapezoidal, slightly convex transversally on disc, with distinct humeral impressions, transverse impression in middle at the suture and impressions in posterior angles, distinctly transverse ($R = 2.68/3.70 = 0.72$), with rounded humeri and straight lateral sides. Elytra dull, surface with very dense isodiametrical microsculpture similar to that on head and pronotum. The microsculpture finer towards scutellum and anterior half of suture.

Abdomen slightly widened to segment VI, very finely and moderately sparsely punctured, basal impression of tergites III-V distinctly more sparsely punctured than other parts of the tergite. Surface with very fine microsculpture consisting of transverse fields.

Male. Sternites III-VI without modifications, sternite VII in posterior two thirds with triangular, medially unpunctured impression, sternite VIII narrowly and deeply emarginate in posterior half, with unpunctured narrow longitudinal area in basal half, tergite X and sternite IX rounded apically. Aedeagus (Fig. 8) 5.1 mm long, with asymmetrical, pointed median lobe and apically dilated internal structure.

Female unknown.

Comparative notes. *Pachypaederus pretoriensis* sp. nov. differs from all Afrotropical *Pachypaederus* by completely dull elytra and shape and internal structure of the aedeagus.

Etymology. Named after Pretoria, where the type specimen was collected.

Distribution. The new species is known from Pretoria (Gauteng Province), South Africa only.

Bionomics. Nothing is known about the bionomics of this species.

***Pachypaederus sarkae* sp. nov.**

(Figs 4, 9, 31, 68-71)

Type locality. South Africa, KwaZulu-Natal province, Ngome.

Type material. Holotype (♂): „South Africa, KZN, Ngome State Forest, 27°49.4'S 31°25.0'E, 18.ix.1992-18.x.1992, 1140 m, M. v. d. Merwe / Unbaited pitfall trap in dense afro-montane indigenous forest, Ngome Arthropod Survey, University Pretoria, sample 10/92-3B“, (SANC). Paratypes: (1 ♂, 2 ♀♀): same data as holotype, (SANC, JRPC); (1 ♀): same data as holotype, but „17.v.1992-17.vi.1992, sample 06/92-3B“, (SANC); (3 ♂♂, 1 ♀): same data as holotype, but „17.vi.1992-18.vii.1992, sample 07/92-3B“, (SANC, JRPC); (1 ♀): same data as holotype, but „18.viii.1992-18.ix.1992, sample 09/92-3B“, (JRPC); (1 ♀): same data as holotype, but „18.x.1992-18.xi.1992, sample 11/92-3B“, (SANC).

Description (n = 11). Body length 20.8-24.0 mm (M = 22.5 mm, HT = 23.8 mm), forebody length 10.0-11.0 mm (M = 10.5 mm, HT = 10.8 mm). Black, pronotum dark reddish-brown, elytra purple or blue, legs, antennae and mouthparts black, antennomeres 8-11 and last segment of maxillary palpi reddish (Fig. 4).

Head rounded trapezoidal, slightly convex, a quarter wider than long ($R = 1.18-1.32$, $M = 1.23$, $HT = 4.04/3.13 = 1.29$). Eyes small, temples nearly thrice as long as eyes ($R = 2.50-3.33$, $M = 2.86$, $HT = 2.85$), rounded, slightly widened behind, posterior angles largely rounded, base slightly emarginate. Surface, except for unpunctured midline, moderately densely and coarsely punctured, interstices between punctures mostly about as large as diameter of puncture, punctures along the middle line finer and sparser. Head shining, without microsculpture, only vaulted lateral parts of tempora with traces of a microsculpture consisting of slightly transverse mesh. Labrum in the middle slightly emarginate, median tooth small and slightly extended. Antennae very long, all segments distinctly longer than wide, fifth segment about thrice as long as wide ($L/W = 2.86-3.83$, $M = 3.29$, $HT = 3.49$), tenth segment more than twice as long as wide ($L/W = 2.14-2.57$, $M = 2.35$, $HT = 2.36$).

Pronotum rounded trapezoidal, moderately convex transversally, as long as wide ($L/W = 0.99-1.03$, $M = 1.01$, $HT = 3.98/3.87 = 1.03$) and as wide as head ($R = 0.95-1.01$, $M = 0.98$, $HT = 3.87/4.04 = 0.96$). Sides distinctly more narrowed anteriorly than posteriorly, slightly rounded. Surface moderately sparsely and finely punctured, much more sparsely and finely than on head. Median furrow in posterior half very shallow. Pronotum shining, without microsculpture.

Elytra distinctly trapezoidal, flattened along suture, distinctly transverse ($R = 0.71-0.78$, $M = 0.74$, $HT = 2.88/4.09 = 0.71$), with oblique, slightly rounded humeri and distinctly emarginate lateral sides. (Fig. 31) Surface irregularly, moderately densely and coarsely punctured, with hardly visible traces of oblique microstriae.

Abdomen slightly widened to segment VII, very finely and moderately sparsely punctured, basal impression of tergites III-V unpunctured. Surface with very fine microsculpture consisting of narrow transverse fields.

Male. Sternites IV-VI in posterior half with narrow unpunctured area in middle, sternite VII with narrow, apically widened unpunctured middle area, sternite VIII with narrow unpunctured area along the middle, narrowly and deeply emarginate in posterior half, tergite X narrowly rounded and sternite IX pointed apically.

Aedeagus (Fig. 9) 5.4-5.9 mm long (n = 5, M = 5.8 mm, HT = 5.8 mm), with asymmetrical, apically narrowed median lobe with a point bent left. Internal structure narrow, not widened apically.

Female. Sternite VIII with wide, moderately deep apico-lateral emarginations, and pointed apex (Figs 70, 71). Sternite IX wide, with deep narrow longitudinal depression at the right side of basal third and rounded apex (Figs 68, 69).

Comparative notes. *Pachypaederus sarkae* sp. nov. differs from other Afrotropical *Pachypaederus* species based on combination of distinctly emarginate lateral sides of elytra and shiny black body with purple or blue elytra.

Etymology. The new species is dedicated to my daughter Šárka on the occasion of her 15th birthday.

Distribution. The new species is known only from Ngome forest in KwaZulu-Natal Province, South Africa.

Bionomics. *P. sarkae* sp. nov. occurs in forest and was collected by pitfall traps between May and November.

***Pachypaederus triangulipennis* sp. nov.**

(Figs 5, 10, 56-59)

Type locality. South Africa, KwaZulu-Natal province, Impendle.

Type material. Holotype (♂): „South Africa, KwaZulu-Natal Impendle, Nhlosane farm, pitfalls, 29°35'S:29°58'E, 1700-1900m, 12-31 Oct 1994, J. Kotze coll.“, (TMSA). Paratypes: (1 ♂): same data as holotype, but „-23 Nov 1993“, (NMSA); (1 ♀): same data as holotype, but „9-21 Dec 1993“, (NMSA); (1 ♂): same data as holotype, but „2-23 Mar 1994“, (JRPC); (1 ♀): same data as holotype, but „30 Mar-12 Apr 1994“, (JRPC). (1 ♀): same data as holotype, but „20 Sep-11 Oct 1994“, (JRPC).

Description (n = 6): Body length 13.8-15.2 mm (M = 14.6 mm, HT = 14.3 mm), forebody length 6.7-7.5 mm (M = 7.0 mm, HT = 6.7 mm). Black, pronotum dark reddish-brown, elytra blue, legs, antennae and mouthparts black, first and last antennomere, basal part of antennomere 2, apical parts of antennomeres 6-10 and last segment of maxillary palpi light reddish-brown (Fig. 5).

Head oblong, very slightly convex, nearly a quarter wider than long (R = 1.17-1.23, M = 1.20, HT = 2.28/1.86 = 1.22). Eyes small, temples about twice as long as eyes (R = 1.83-2.17, M = 1.97, HT = 1.93), slightly narrowed behind, posterior angles rounded, base not emarginate. Surface, except for unpunctured large midline and large transverse unpunctured area of frons, moderately sparsely and finely punctured, interstices between punctures about two or three times as large as diameter of puncture. Head with very fine and sparse micropunctures. Labrum in middle slightly emarginate, median tooth small and not extended.

Antennae moderately long, all segments distinctly longer than wide, fifth segment more than twice as long as wide (L/W 2.11-2.46, M = 2.32, HT = 2.29), tenth segment twice as long as wide (L/W = 1.45-1.96, M = 1.69, HT = 1.96).

Pronotum rounded trapezoidal, moderately convex transversally, as long as wide or slightly longer than wide (L/W 1.00-1.08, M = 1.02, HT = 2.23/2.24 = 1.00) and slightly narrower than head (R = 0.93-1.00, M = 0.96, HT = 2.24/2.28 = 0.98). Surface moderately sparsely and finely punctured, slightly more sparse and coarse than on head, without any microsculpture or micropunctures.

Elytra trapezoidal, slightly convex transversally on disc, distinctly transverse (R = 0.77-0.83, M = 0.80, HT = 1.69/2.04 = 0.83), with oblique humeri and straight lateral sides. Surface finely and sparsely punctured, with traces of transverse striae or mesh.

Abdomen slightly widened to segment VII, very finely and moderately sparsely punctured, basal impression of tergites III-V distinctly more sparsely punctured than other parts of tergites. Surface with very fine microsculpture consisting of transverse fields.

Male. Sternites III-VI without modifications, sternite VII in posterior two thirds with wide triangular impression with unpunctured area before posterior margin, sternite VIII narrowly and deeply emarginate in posterior half, tergite X and sternite IX rounded apically. Aedeagus (Fig. 10) 3.6 mm long (HT), with very narrow apical half of median lobe terminated by triangularly pointed apex. Internal structure distinctly dilated apically.

Female. Sternite VIII, with deep apico-lateral emarginations, and narrowly rounded apex (Figs 58, 59). Sternite IX narrow, with slightly depressed lateral sides basally, with deep rounded heart-shaped depression in the middle and slightly emarginate apex (Figs 56, 57).

Comparative notes. *Pachypaederus triangulipenis* sp. nov. is externally similar to *P. crassus* (Boh.), but differs by coarsely punctured head and pronotum. From the syntopic *P. wendeleri* Fagel, the new species differs by densely punctured abdominal tergites and different shape of the aedeagus and female sternite IX. *T. triangulipenis* sp. nov. differs from all the *Pachypaederus* species by its shape and internal structures of aedeagus.

Etymology. The new species is named based the shape of the apex of the median lobe, which is triangular (from Latin *triangulipenis* = having a triangular aedeagus).

Distribution. The new species is known only from Impendle, Nhlosane farm, in KwaZulu-Natal Province, South Africa.

Bionomics. All specimens were found in ground traps from September to December and from March to April.

Figs 11-20. 11, 16- *P. bidens* Willers; 12, 17- *P. caheni* Fagel; 13, 18- *P. confusus* Fagel; 14, 19- *P. crassus crassus* (Boh.); 15, 20- *P. newtoni* (Last). 11-15: habitus, 16-20 aedeagus.

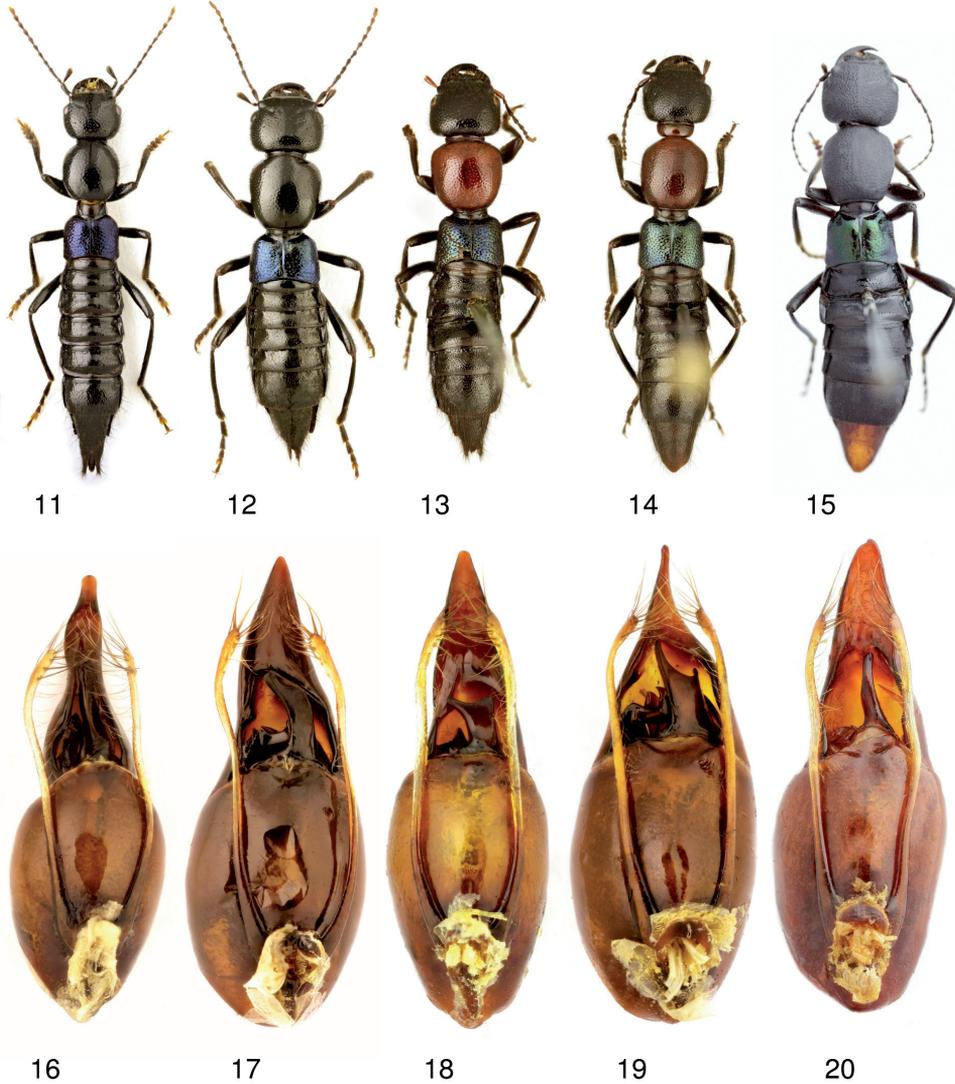
FAUNISTICS

Pachypaederus bidens Willers, 2003

(Figs 11, 16)

Material examined. SOUTH AFRICA: KwaZulu-Natal: Ngomi Forest, 27°51' S 31°23' E, 24-27.xi.2006, beating, J. Janák leg., 1 ♂, 1 ♀, (JRPC); Ngome State Forest, 27°49.3' S 31°25.0' E, 18.ix.1992-18.x.1992, 1150 m, M. v. d. Merwe, unbaited pitfall trap in dense afro-montane indigenous forest, Ngome Arthropod Survey, University Pretoria, 1 ♂, (SANC).

Discussion. Additional records from type locality.



***Pachypaederus caheni* Fagel, 1965**

(Figs 12, 17, 32)

Material examined. SOUTH AFRICA: Limpopo: N. Transvaal, Soutpansb., Hanglip, 23.02 S – 29.47 E, 14.iv.1973, E-Y 48, sifted, compost, leg. Endrödy-Younga, 1 ♂, (TMSA); same data, but 14.iii.1973, E-Y 50, 1 ♂ 1 ♀, (JJRC, TMSA); Soutpansb., Hanglip, 30.00 S – 29.54 E [sic!], 18.iii.1973; E-Y 74, trunk alive tree, leg. Endrödy-Younga, 1 ♀, (TMSA).

Discussion. Additional records from type locality.

***Pachypaederus confusus* Fagel, 1958**

(Figs 13, 18, 30, 47-51)

Material examined. SOUTH AFRICA: KwaZulu-Natal: Bergville distr., Drakensberg, Mhlwazeni Riv. 1200 m, Z.A. 25, x. 1960, M. Leleup, det. Fagel, 1 ♀, (TMSA); Kamberg Nat. Reserve, 1.-6.x.1978, J. G. H. Londt, riverside/open road, 3 ♀♀ (SANC, JRPC).

Female. Sternite VIII with moderately deep apico-lateral emarginations and narrowly rounded apex (Figs 49-51). Sternite IX narrow, with slightly depressed lateral sides basally, without any other depression in the middle and slightly emarginate or rounded apex (Figs 47, 48).

Discussion. Hitherto known from 3 localities in KwaZulu-Natal province and from Johannesburg.

***Pachypaederus crassus crassus* (Boheman, 1848)**

(Figs 14, 19, 27, 29, 52-55)

Material examined. SOUTH AFRICA: KwaZulu-Natal: Umbombo Mt., VIII. 1975, leg. P. E. Reavel, 1 ♂, (TMSA); Ubombo Mountain Nature Reserve, 27.5898° S, 32.08406° E, WGS84, 470 m, 29.ix.2004, Armstrong AJ, EKZNW Record ID: 328208, under a rock in tall, recently burnt grassland with Acacia trees on a gentle slope, 1 ♂, 1 ♀, (TMSA, JJRC); Empangeni, 28.44 S – 31.54 E, viii.1978, P. Reavell, det. Willers, 1 ♂, (SANC); same data, but 8.iv.1985, 1 ♀, (SANC); Enseleni Nature Reserve, 28°40' S, 32°00' E, 40m, 18.xii.1998, P. E. Reavell, det. Willers, 1 ♂, (SANC); KZN University of Zululand, 28.54 S – 31.45 E, 75 m, 10.viii.2000, P. E. Reavell, det. Willers, 3 ♂♂, (SANC); University of Zululand near Empangeni, 28.45 S – 31.45 E, c. 75 m, 25.vii.1975, Ngongoni veld, P. E. Reavell, 1 ♂, (SANC); Ngome State Forest, 27.49 S, 21.25 E, 1100m, 05.-08.ii.1996, R. Stals, det. Willers, 1 ♀, (SANC); Gelijkwater Nature Reserve, 28° 22' 25.86" S, 31° 3' 56.27" E, 1311 m, 17.xi.2010, AJ Armstrong, grassland, hillside, in short, recently burnt grassland, EKZNW Record ID: 329856, 1 ♀, (TMSA); Robinsons Bush, 28.572741° S, 29.044686° E, 1793 m, 12.x.2003, AJ Armstrong, SC Richert, in rocky area of Protea savanna with short grass burnt in June 2003, EKZNW Record ID: 328221, 1 ♀, (TMSA); Babanango, Gelykwater Farm, 28.3852065° S, 31.0593527° E, 1326 m, 15.ix.2004, AJ Armstrong, S Louw, under rock on rocky ridge with short, recently burnt grassland and some shrubs, EKZNW Record ID: 328306, 1 ♀, (TMSA); Hluhluwe, x. 1935, L. F. Lawrence, 2 ♀♀, (TMSA, JRPC); Drakensb., Cathedral Peak for., 28.57 S – 29.12 E, 15.iii.1976, E-Y: 1088, from under stones, leg. Endrödy – Younga, 2 ♀♀, (TMSA, JJRC); Mpumalanga: Uitsoek, high alt. grassveld, 25.15 S – 30.34 E, 25.x.1986, E-Y: 2316, from under stones, leg. Endrödy-Younga, 1 ♂, 2 ♀♀, (TMSA, JJRC); Knuckles graasveld, 25.47 S – 30.49 E, 4.xii.1986, E-Y: 2353, groundtraps, 67 days, leg. Endrödy-Younga, groundtrap with banana, 1 ♀, (TMSA).

Female. Sternite VIII with very shallow apico-lateral emarginations and shortly pointed apex (Figs 54, 55). Sternite IX wide, slightly depressed at right side of base, without any other depression in middle and deeply emarginate apex (Figs 52, 53).

Discussion. The most common and the most widely distributed species of *Pachypaederus* in South Africa, but without detailed data, as the previous authors did not publish precise localities.

Pachypaederus leleupi Fagel, 1965

Material examined. SOUTH AFRICA: Mpumalanga: E. Transvaal, Berlin F. S., gorge, 25.32 S – 30.44 E, 22.ix.1986, E-Y 2284, litt. rock crevices, leg. Endrödy-Younga, 1 ♂, (TMSA).

Discussion. Hitherto known only from type locality - Mariepskop forest in Mpumalanga Province.

Pachypaederus newtoni (Last, 1950)

(Figs 15, 20)

Material examined. SOUTH AFRICA: KwaZulu-Natal: Nkandla F. N. R., 28.42 S – 31.07 E, 31.x.1979, L. Schulze, 1 ♂, 1 ♀, (TMSA); Zululand, July 1936, R. F. Lawrence, 1 ♂, (JRPC).

Discussion. Hitherto known only by two type specimens from Nkhandla (Last 1950). The female holotype was studied by Fagel (1958). The aedeagus is as in Fig. 20, with the median lobe asymmetrically pointed apically and with a long and narrow internal structure. The aedeagus of *P. newtoni* is very similar to the picture published by Fagel (1958) as *P. natalensis* Fagel, 1958 (cf. Fig. 44).

Pachypaederus nigriventris Fagel, 1965

Material examined. SOUTH AFRICA: Limpopo: Debegeni Falls, 5 km S. E. Magoebaskloof, N. Tvl., 27.ii.1973, A. Primslov, T. Bouwer, det. Willers, 1 ♂, (SANC); Magoebaskloof, i. 1961, P. P. de Moor, 1 ♂, (TMSA); Woodbush, near Haenertsburg, E. Tvl., 10.xi.1970, L. Prozesky and Strydom, 2 ♀♀, (TMSA, JRPC); De Hoek Forest Res., ca. 10 km W Tsaneen [= Tzaneen], 17.ix.1986, Stuckenberg & Londt, indigenous forest, det. Willers, 1 ♀, (SANC).

Discussion. Hitherto known only from Helpmekeer River and Woodbush Forest in Limpopo Province.

Pachypaederus puncticollis (Bernhauer, 1912)

(Figs 21, 24)

Material examined. SOUTH AFRICA: KwaZulu-Natal: St. Lucia, Mission Rock, 28.22 S – 32.35 E, 8.xii.1975, E-Y: 865, at U. V. light, leg. Endrödy-Younga, 1 ♂, (TMSA); Limpopo: Arbor farm, Levubu, 23.05 S – 30.17 E, 28.i.1998, E-Y: 3320, at light, leg. R. Müller, det. Willers, 1 ♂, (TMSA); Province unknown: Woodb. Vill., iv. 1915, C. J. Swierstra, 1 ♂, (JJRC). ZIMBABWE: Salisbury [= Harare], det. Willers, 1 ♂ 5 ♀♀ (SANC); Mt. Selinda, S of Chipingwe, 12.-13.xii.1998, A. Kudrna jr. lgt., 2 ♂♂, 1 ♀, (JJRC); NE, 50 km W Kasama, 26.xi.2004, Snížek & Tichý lgt., 1 ♂ (JJRC).

Discussion. Reported from the area between Guinea and Zimbabwe (Fagel 1958). This is the first record from South Africa.

***Pachypaederus reductus* Fagel, 1965**

(Figs 22, 25, 28)

Material examined. SOUTH AFRICA: Mpumalanga: Mariepskop, 24.35 S – 30.50 E, 5.v.1981, E-Y : 1777, beaten, cloud forest, leg. Endrödy-Younga, 1 ♂, 1 ♀, (TMSA, JJRC); Mount Shebs Forest, m. Pilgrim's Res. 1700 m, 24.56 S 30.42 E, 17.xii.1995, R. Stals, det. Willers, 1 ♂, 1 ♀, (SANC); Uitsoek forest, 25.17 S – 30.34 E, 29.i.2005, E-Y : 3634, sifting, small indig. forest, leg. Ruth Müller, 1 ♂, 1 ♀, (TMSA).

Discussion. Hitherto known from the type locality only - Mariepskop forest in Mpumalanga Province. The shape and internal structures of the aedeagus in the specimen from Uitsoek forest are slightly different compared to specimens from the type locality and thus, additional specimens from Uitsoek forest are needed for a further study of their status.

***Pachypaederus cf. sparsicollis* Fagel, 1958**

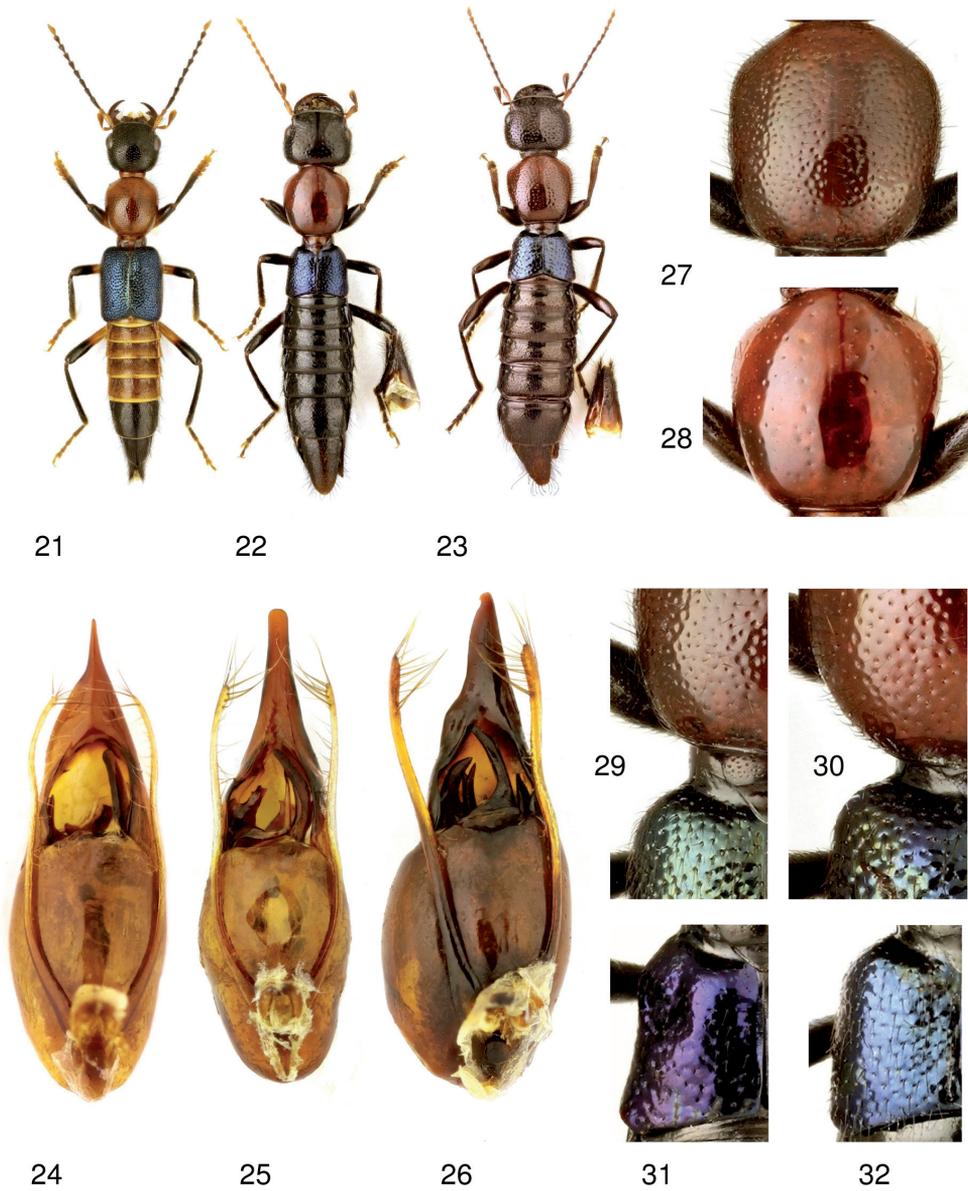
Material examined. SOUTH AFRICA: Mpumalanga: Sabie env., 25°13.1'S, E 30°37'E, 1200 m, 10.-11.ii.2004, sifted litter, P. Hlaváč lgt., 1 ♀ cf. det., (JJRC); Eastern Cape: Grahamstown, 18.ix.1948, K. T. Coates Palgrave, det. Fagel, 1 ♀, (TMSA).

Discussion. Hitherto known only from one unspecified locality in KwaZulu-Natal and from Grahamstown in Eastern Cape (one ♀). The specimen from Grahamstown differs by microsculptured elytra and may represent a different species. The distribution and variability of this species remain poorly known.

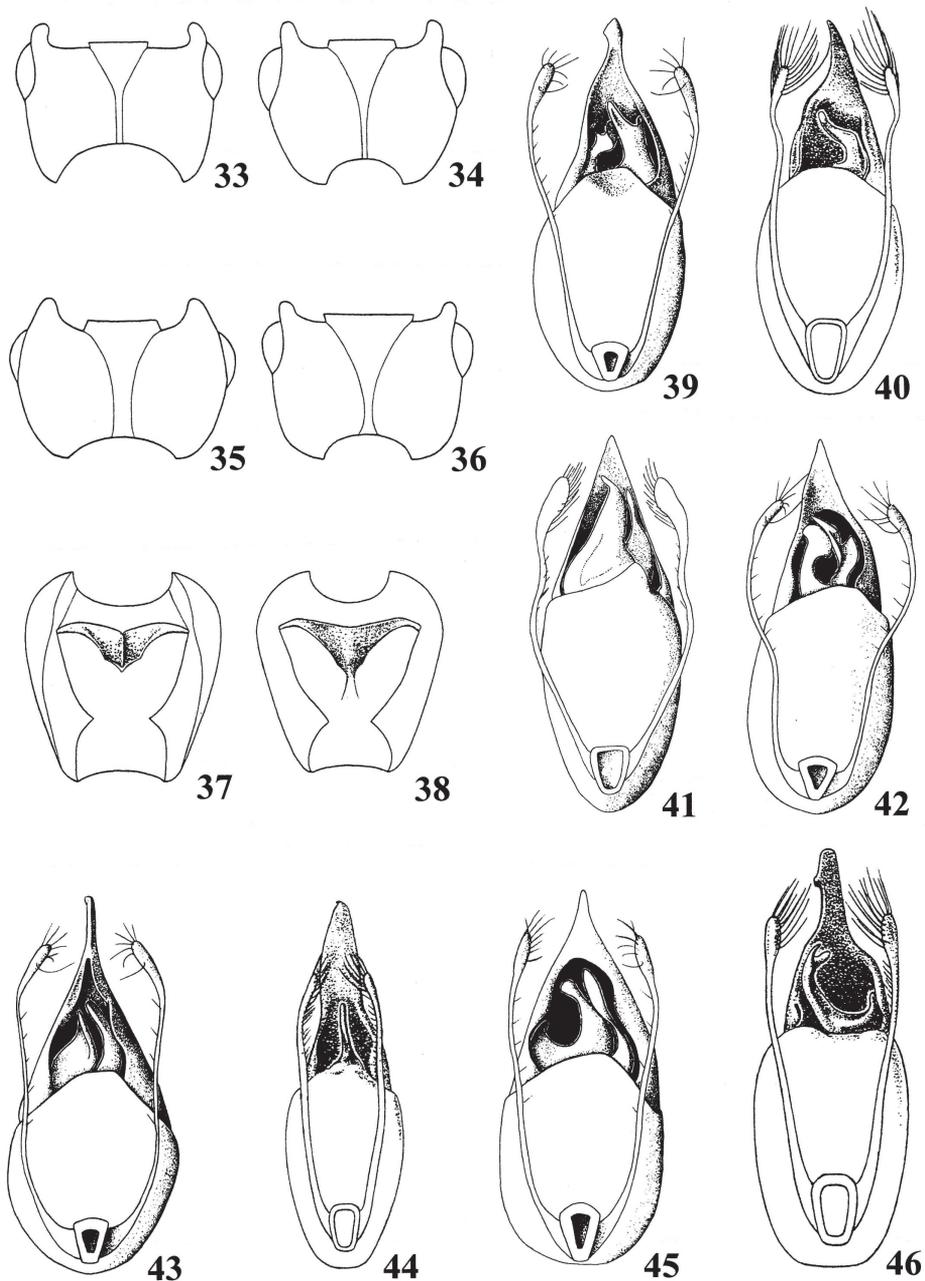
***Pachypaederus wendeleri* Fagel, 1958**

(Figs 23, 26, 60-63)

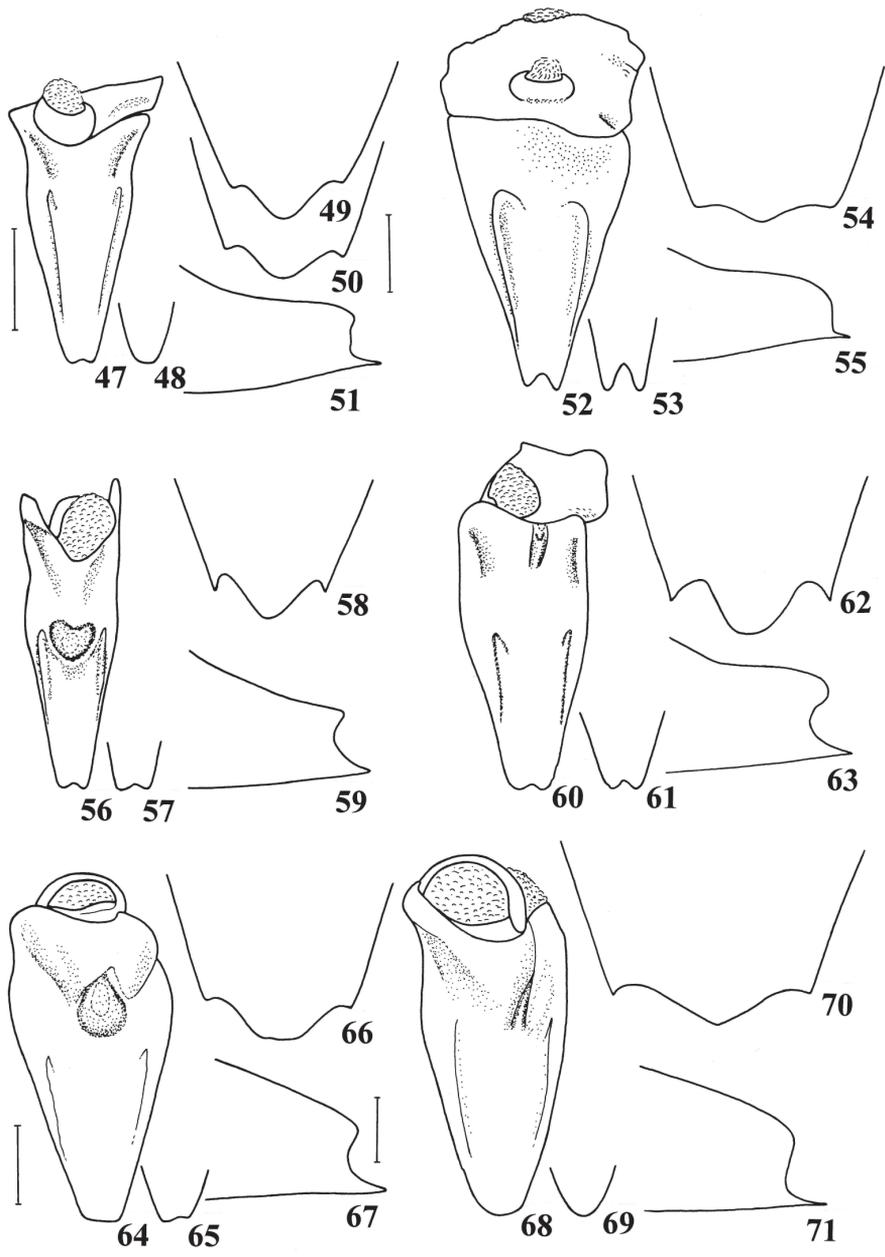
Material examined. SOUTH AFRICA: KwaZulu-Natal: Coleford Nature Res., 29.57 S, 29.27 E, 16.xi.1981, I. M. Millar, det. Willers, 1 ♂, (SANC); Natal, Giant's Castle G. R., between Main Camp and Bannerman Hut, at 29°16'S, 29°28'E, 1700-2300 m, 23.-25.iv.1994, Harrison & Stals, det. Willers, 1 ♂, (SANC); Swartwater Dam, nr. The Sentinel, 28.44 S, 28.54 E, 05.viii.1998, C. Dreschodt, det. Willers, 1 ♀, (SANC); Impendle, Nhlosane farm, pitfalls, 29°35'S, 29°58'E, 1700-1900m, - 23.xi.1993, J. Kotze coll., 1 ♀, (NMSA); dtto, but 24.xi.-8.xii.1993, 1 ♀, (JJRC); dtto, but 9-21.xii.1993, 1 ♂, (NMSA); dtto, but 22.xii.-5.i.1994, 4 ♀♀, (NMSA, JJRC); dtto, but 6.-18.i.1994, 2 ♀♀, (JJRC); dtto, but 19.i.-1.ii.1994, 1 ♀, (NMSA); dtto, but 2.-15.ii.1994, 3 ♀♀, (NMSA, JJRC); dtto, but 16.ii.-1.iii.1994, 2 ♀♀, (NMSA, JJRC); dtto, but 2.-23.iii.1994, 4 ♂♂, 3 ♀♀, (NMSA, JJRC); dtto, but 24.-29.iii.1994, 5 ♂♂, 8 ♀♀, (NMSA, JJRC); dtto, but 30.iii.-12.iv.1994, 6 ♂♂, 2 ♀♀ (NMSA, JJRC); dtto, but 1.vi.-1.vii.1994, 3 ♀♀, (NMSA, JJRC); dtto, but 30.viii.-19.ix.1994, 1 ♂, (JJRC); dtto, but 12.-31.x.1994, 1 ♂ (JJRC); Nsikeneni Vlei Nature Reserve, 30.1461° S, 29. 4621° E, 3.xi.2010, AJ Armstrong, 1812 m, under rock, short, recently-burnt grassland, dorelite ridge, 1 ♂, (DMNH); dtto, but 30° 7' 9.70''S, 29° 28' 1.38''E, 1807 m, Armstrong AJ, EKZNW Record ID: 330135, grassland, ridge, under stones in short, recently-burnt grassland on a dorelite ridge, 4 ♀♀, (DMSA, TMSA); dtto, but 30° 8' 47.08''S, 29° 27' 47.95' 'E, 1809 m, ID: 330134, 1 ♀, (DMSA); dtto, but 30° 8' 46.68 'S, 29° 27' 45.25'' E, 1817 m, ID: 330142, 1 ♀, (DMSA); Inchbrakie Farm, Tunga's Hill, 29° 21' 5.33'' S, 29° 54' 14.18'' E, 21.x.2008, AJ Armstrong, PS Khubeka, E-J Cleasby, grassland, summit, under cow path in short grassland with many forbs, EKZNW Record ID: 330059, 1 ♀, (TMSA).



Figs 21-32. 21, 24- *P. puncticollis* (Bernh.); 22, 25, 28- *P. reductus* Fagel; 23, 26- *P. wendeleri* Fagel; 27, 29- *P. crassus crassus* (Boh.); 30- *P. confusus* Fagel; 31- *P. sarkae* sp. nov.; 32- *P. caheni* Fagel. 21-23: habitus; 24-26: aedeagus; 27, 28: pronotum; 29, 30: left side of pronotum and elytra; 31, 32: left elytron.



Figs 33-46. 33, 37- *Pachypaederus* sp., 34- *Paederidus* sp., 35- *Oreopaederus* sp., 36, 38- *Paederus* sp., 39- *P. crassus meeresmanae* Fagel, 40- *P. delagoanus* (Bernh.), 41- *P. lasti* Fagel, 42- *P. leleupi* Fagel, 43- *P. minutus* Fagel, 44- *P. natalensis* (Last), 45- *P. nigriventris* Fagel, 46- *P. sparsicollis* Fagel. 33-36: ventral side of head with gular grooves, 37, 38: dorsal side of pronotum, 39-46: aedeagus. All Figs after Fagel (1958, 1961, 1965).



Figs 47-71. 47-51- *P. confusus* Fagel; 52-55- *P. crassus crassus* (Boh.); 56-59- *P. triangulipennis* sp. nov.; 60-63- *P. wendeleri* Fagel; 64-67- *P. opacinus* sp. nov.; 68-71- *P. sarkae* sp. nov. 47, 52, 56, 60, 64, 68- female sternite IX; 48, 53, 57, 61, 65, 69- apex of female sternite IX, different specimen; 49, 50, 54, 58, 62, 66, 70- female sternite VIII dorsally; 51, 55, 59, 63, 67, 71- female sternite VIII, lateral view. Scale 0,5 mm (47 = 48 = 52 = 53 = 56 = 57 = 60 = 61; 49 = 50 = 51 = 54 = 55 = 58 = 59 = 62 = 63; 64 = 65 = 68 = 69; 66 = 67 = 70 = 71).

Female. Sternite VIII with moderately deep apico-lateral emarginations and with widely rounded apex (Figs 62, 63). Sternite IX moderately wide, with slightly depressed lateral sides basally, and narrow deep longitudinal depression at base near to middle and slightly emarginate apex (Figs 52, 53).

Discussion. Distributed in the western part of KwaZulu-Natal Province. Reported also from Delagoa Bay in Mozambique by Fagel (1958) based on single female. According to the current state of knowledge of the distribution of southern African species, this locality seems to be very improbable.

Pachypaederus sp. A

Material examined. SOUTH AFRICA: KwaZulu-Natal: Entumeni Nature Reserve, 28.8758308° S, 31.3802361° E, 2.v.2006, AJ Armstrong, S Louw, D Eckard, EKZNW Record ID: 328288, 1 ♂, (TMSA).

Discussion. This teneral specimen has similar color and size as *P. caheni* and *P. nigriventris*, but it differs by some characters, mainly by a different shape of the pronotum and elytra with oblique humeri and distinctly emarginate lateral sides. These characters are similar in *P. obscuricollis* (Bernhauer, 1927), described from Delagoa Bay (Mozambique). The aedeagus is similar to that of *P. caheni*, with a similar internal structure, but the apex of the median lobe is larger and distinctly turned to the left. It may be a new species, but additional specimens are needed for study before making a definitive decision.

Pachypaederus sp. B

Material examined. SOUTH AFRICA: KwaZulu-Natal: Ingwavuma, July 1938, R. F. Lawrence, 1 ♂, (TMSA).

Discussion. This specimen has similar color, size and sculpture as *P. caheni*, but it differs by its more convex pronotum, different shape of the pronotum and the trapezoidal elytra with oblique humeri and distinctly emarginate lateral sides. These characters are similar in *P. obscuricollis* (Bernhauer, 1927), described from Delagoa Bay (Mozambique). The aedeagus is in general shaped like that of *P. caheni*, but the apex is slightly turned to the left and the internal structure is distinctly widened apically. It may represent a new species as well, but additional specimens are needed for study before making a definitive decision.

Pachypaederus spp.

Material examined. SOUTH AFRICA: KwaZulu-Natal: Makatini flats, viii.1975, leg. P. E. Reavell, 1 ♀, (TMSA); Sani Pass, 29°34'S, 29°28'E, 22.ix.2005, M. Potgieter, 1 ♀, (SANC); Krantzkop, i.1915, E. Warren, 1 ♀, (TMSA); Entabeni, Zpbg, Nov., 1931, G. van Son, 2 ♀♀, (TMSA).

Discussion. From these localities, only isolated females are known and may represent several different species. Additional specimens would be appreciated in order to precisely determine the species.



Figs 72, 73. 72- Mt. Gilboa, locality of *P. opacinus* sp. nov.; 73- place where the type specimens were collected.

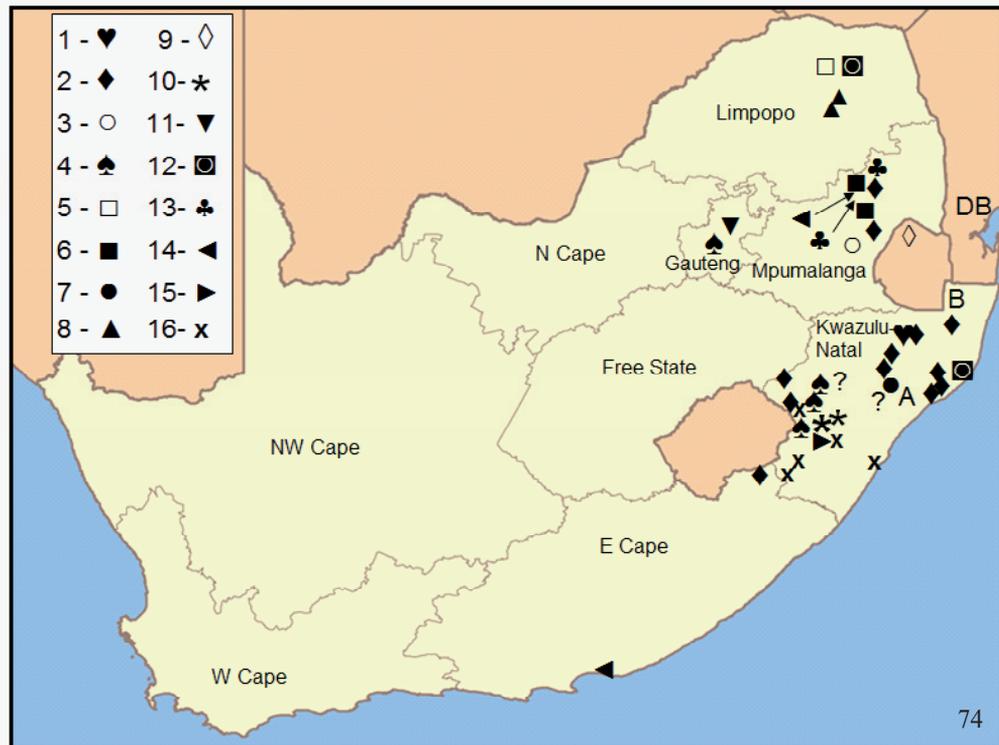


Fig. 74- Distribution of *Pachypaederus* in South Africa. 1- *P. bidens* Willers & *P. sarkae* sp. nov., 2- *P. crassus crassus* (Boh.), 3- *P. crassus meersmanae* Fagel, 4- *P. confusus* Fagel, 5- *P. caheni* Fagel, 6- *P. leleupi* Fagel, 7- *P. newtoni* (Last) & *P. lasti* Fagel, 8- *P. nigriventris* Fagel; 9- *P. minutus* Fagel, 10- *P. opacinus* sp. nov.; 11- *P. pretoriensis* sp. nov., 12- *P. puncticollis* (Bernh.), 13- *P. reductus* Fagel, 14- *P. sparsicollis* Fagel, 15- *P. triangulipenis* sp. nov., 16- *P. wendeleri* Fagel, A, B, ?- *P. sp.*, DB- Delagoa Bay.

KEY TO SOUTHERN AFRICAN SPECIES OF *PACHYPAEDERUS* (AFTER FAGEL (1965), MODIFIED AND SUPPLEMENTED)

1. Elytra completely dull, with very dense microsculpture and short setae. Length 21 mm. Habitus: Fig. 3, aedeagus: Fig. 8. South Africa: Gauteng: Pretoria. *P. pretoriensis* sp. nov.
- Elytra shining, at most with some sparse traces of microsculpture. 2
2. Abdomen completely dull, with very fine punctuation. 3
- Abdomen always more or less shining, never completely dull, with much more distinct punctuation 5
3. Head and pronotum shining, without microsculpture. Length 22-23 mm. Aedeagus: Fig. 44. South Africa: KwaZulu-Natal: Qudeni. *P. natalensis* (Last, 1950)
- Head and pronotum dull, with very distinct microsculpture. 4
4. Very large species, strongly microsculptured without any shine, except of dark green shining elytra. Length 25 mm. Habitus: Fig. 15, aedeagus: Fig. 20. South Africa: KwaZulu-Natal: Nkandla. *P. newtoni* (Last, 1950)
- Distinctly smaller species, slightly shining though microsculptured, except of blue elytra. Length 14 mm. Male unknown. Zimbabwe: Vumbu Mts. *P. rhodesianus* (Bernhauer, 1927)
5. Abdomen partly yellow or reddish. Length 12-13.5 mm. Habitus: Fig. 21, aedeagus: Fig. 24. Africa south of Sahara. *P. puncticollis* (Bernhauer, 1912)
- Abdomen completely black. 6

6. Pronotum completely dull with very dense microsculpture. Length 18-20 mm. Habitus: Figs 1, 2, aedeagus: Figs 6, 7, ♀ sternite IX: Figs 64, 65. South Africa: KwaZulu-Natal: Karkloof, Gilboa, Northington. *P. opacinus* sp. nov.
- Pronotum shiny, without microsculpture. 7
7. Elytra trapezoidal with emarginated lateral margins and less distinct humera (Fig. 31). 8
- Elytra most often oblong, rarely trapezoidal with rounded humeri, but with straight lateral sides (Figs 29, 30, 32). 10
8. Larger species, > 20 mm. Head densely punctured with interstices 1.5-2 times larger than diameter of punctures. Length 21-24 mm. Habitus: Fig. 4, aedeagus: Fig. 9, ♀ sternite IX: Figs 68, 69. South Africa: KwaZulu-Natal: Ngome. *P. sarkae* sp. nov.
- Smaller species, < 20 mm. Head sparsely punctured with interstices 2-3 times larger than diameter of punctures. 9
9. Tergites regularly densely punctured, except for basal transversal impression, last abdominal segments distinctly duller than basal segments, with umbilicate sculpture. Length 17-19 mm. Aedeagus: Fig. 40. Mozambique: Delagoa Bay. *P. delagoanus* (Bernhauer, 1927)
- Tergites very sparsely punctured, basal transversal impression unpunctured, last abdominal segments hardly duller than basal segments, sculpture hardly umbilicate. Length 18 mm. Aedeagus: unknown. Mozambique: Delagoa Bay. *P. obscuricollis* (Bernhauer, 1927)
10. Pronotum black, like head and abdomen. 11
- Pronotum red-orange, sometimes slightly brownish. 14
11. Elytra oblong with distinct humeri. 12
- Elytra trapezoidal with flattened humeri. 13
12. Pronotum rounded, trapezoidal with maximal width at anterior two sevenths, lateral sides only very slightly rounded. Length 17-21 mm. Habitus: Fig. 12, aedeagus: Fig. 17. South Africa: Mpumalanga: Hanglipbos Forest. *P. caheni* Fagel, 1965
- Pronotum egg-shaped with maximal width at anterior three sevenths, lateral sides distinctly rounded. Length 15-16 mm. Habitus: Fig. 11, aedeagus: Fig. 16. South Africa: KwaZulu-Natal: Ngome. *P. bidens* Willers, 2003
13. Tempora without microsculpture, pronotum narrowed more posteriad than anterior, lateral sides straight posteriad, pronotum and elytra sparsely punctured. Length 13 mm. Aedeagus: Fig. 41. South Africa: KwaZulu-Natal: Nkandla, Nqutu. *P. lasti* Fagel, 1961
- Tempora finely reticulate, pronotum not narrowed more posteriad than anterior, lateral sides distinctly and regularly rounded, pronotum and elytra moderately densely punctured. Length 13-14 mm, Aedeagus: Fig. 45. South Africa: Mpumalanga: Helpmekaar river, Woodbush forest. *P. nigriventris* Fagel, 1965
14. Tergites III-V sparsely and finely punctured, punctuation nearly missing in basal impressions. 15
- Tergites III-V densely and coarsely punctured, slightly less in basal impressions. 19
15. Pronotum densely punctured. Distance between punctures mostly about twice as large as diameter of puncture (Fig. 27). 17
- Pronotum sparsely punctured. Distance between punctures often larger than three times as large as diameter of puncture (Fig. 28). 18
17. Tergites very sparsely punctured, middle part of tergite V with transverse distance between punctures about 4-5 times larger than diameter of punctures. Length 11-15 mm. Habitus: Fig. 23, aedeagus: Fig. 26, ♀ sternite IX: Figs 60, 61. South Africa: KwaZulu-Natal. *P. wendeleri* Fagel, 1958
- Tergites moderately sparsely punctured, middle part of tergite V with transverse distance between punctures about 2-3 times larger than diameter of punctures. Length 14-15 mm. Habitus: Fig. 5, aedeagus: Fig. 10, ♀ sternite IX: Figs 56, 57. South Africa: KwaZulu-Natal: Impendle. *P. triangulipenis* sp. nov.
18. Pronotum distinctly finely punctured than head or elytra. 20
- Pronotum not finely punctured than head or elytra. Body smaller, slender, about 12 mm long. Aedeagus: Fig. 43. Swaziland: Piggs Peak. *P. minutus* Fagel, 1965
19. Pronotum very finely, sparsely irregularly punctured with unpunctured area (Fig. 28). Length 14-15 mm. Habitus: Fig. 22, aedeagus: Fig. 25. South Africa: Mpumalanga: Mariepskop. *P. reductus* Fagel, 1965
- Pronotum moderately finely and sparsely, but regularly punctured. Body larger and robust, nearly 15 mm long. Aedeagus: Fig. 46. South Africa: KwaZulu-Natal, Eastern Cape: Grahamstown. *P. sparsicollis* Fagel, 1958

20. Pronotum hardly more narrowed posteriorly than anteriorly, punctuation on head, pronotum, elytra and abdomen very dense. Length 15-17 mm. Aedeagus: Fig. 39. South Africa: Mpumalanga: Carolina district. *P. crassus meersmanae* Fagel, 1965
 - Pronotum distinctly more narrowed posteriorly than anteriorly. 21
21. Abdomen very densely punctured, elytra more coarsely punctured than pronotum, and with more elevated interstices (Fig. 30). ♂: temples divergent; ♀: head strongly transverse, much shorter than pronotum (0,80). Length 15-16 mm. Habitus: Fig. 13, aedeagus: Fig. 18, ♀ sternite IX: Figs 47, 48. South Africa: KwaZulu-Natal: Frere, Drakensberg. *P. confusus* Fagel, 1958
 - Abdomen distinctly less densely punctured, elytra mostly (exceptions in some *P. crassus crassus*) less coarsely punctured than pronotum (Fig. 29). ♂: temples not divergent; ♀: head less transverse, subrectangular, slightly shorter than pronotum (0,92-0,95). 22
22. Apex of median lobe of aedeagus slightly widened (Fig. 19). Length 10-16 mm. Habitus: Fig. 14. South Africa: KwaZulu-Natal, Eastern Cape. *P. crassus crassus* (Boheman, 1848)
 - Apex of median lobe of aedeagus not widened (Fig. 42). Length 17-18 mm. South Africa: Mpumalanga: forest of Mariepskop. *P. leleupi* Fagel, 1965

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