

New data on proctotrupid wasp genus *Exallonyx* Kieffer (Hymenoptera: Proctotrupidae) from South Africa, with description of a new species and new synonymy

by

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ABSTRACT

New data on the distribution of the proctotrupid genus *Exallonyx* in South Africa are provided. One new species, *E. townesi* Kolyada, is described from the Western Cape and KwaZulu-Natal provinces. *E. cingulatus* Townes, 1981 is synonymised with *E. leptocorsa* Townes, 1981. A key is provided to the four species of *Exallonyx* recorded from South Africa.

INTRODUCTION

The proctotrupid wasp fauna of sub-Saharan Africa is amazingly poor and includes only two genera. The monobasic genus *Afroserphus* Masner, 1961 is recorded from equatorial Africa only. The world-wide genus *Exallonyx* Kieffer, 1904 comprises more than 160 species (Townes & Townes 1981; Johnson 1992), although some of them will undoubtedly fall into synonymy. Only nine species of *Exallonyx* are found in the afrotropics, and five of them have been recorded from South Africa. Herewith, we provide new data on species distribution, establish a new synonym in *Exallonyx*, and describe a new species of this genus.

In addition to the four species recorded in this study, Townes and Townes (1981) mentioned *E. trifoveatus* Kieffer, 1904 as occurring in South Africa. This species is widely distributed in holarctic forests and is recorded from Hawaii, New Zealand and Tasmania (Townes & Townes 1981). However, we did not find it in our extensive material and refrain from confirming its presence until new collections become available.

The biology of the genus *Exallonyx* is poorly known. Like nearly all proctotrupid wasps, species of this genus prefer damp and temperate habitats. Their known hosts are rove beetles (Staphylinidae) (Townes & Townes 1981).

MATERIAL AND METHODS

Specimens were collected using Malaise traps (MT), yellow pan traps (YPT), pitfall traps, and sweepnets. Before mounting specimens from alcohol, they were placed in 100% ethanol for dehydration and cleaning, then transferred into a vial with hexamethyldisilazane (HMDS) for one-half to two hours, and finally put on to a glass plate for drying and setting. This treatment gives excellent results, and an extra change of hexamethyldisilazane is unnecessary. Extremely dirty specimens (like those from

pitfall traps) were put into a weak solution of bioactive washing powder, gently shaken several times, then rinsed in water and treated as above.

Morphology was studied using light microscopy and environmental scanning electron microscopy (ESEM) with a maximum magnification of 5000 X.

The material studied is housed in the South African Museum, Cape Town (SAMC), Natal Museum, Pietermaritzburg (NMSA), and National Collection of Insects, Pretoria (PPRI-NCI).

TAXONOMY

Genus *Exallonyx* Kieffer, 1904

Key to South African species

1. Posteroventral corner of pronotum with one pit (Fig. 8) **townesi** sp. n.
- Posteroventral corner of pronotum with two pits (Fig. 7) 2
2. ♀. Ovipositor sheath without longitudinal striation, but with isolated pits. ♂. Gena high, 0.5 times as high as shortest diameter of eye (Fig. 1) **alticola** Kieffer
- ♀. Ovipositor sheath longitudinally striated. ♂. Gena low, 0.2 times as high as shortest diameter of eye (Fig. 2) 3
3. ♀. Petiole with one prominent transverse ridge ventrally and much smoothed laterally. ♂. All coxae yellow, hind coxae sometimes light brown. Median part of setal strip along dorsal edge of pronotum wide and consisting of 3–5 setae (Fig. 7). Propodeal sculpture smooth **subteres** Townes
- ♀. Petiole with several transverse ridges ventrally and not smoothed laterally. ♂. All coxae black. Median part of setal strip along the dorsal edge of pronotum narrow and consisting of only 1 seta (Fig. 5). Propodeal sculpture rough **leptocorsa** Townes

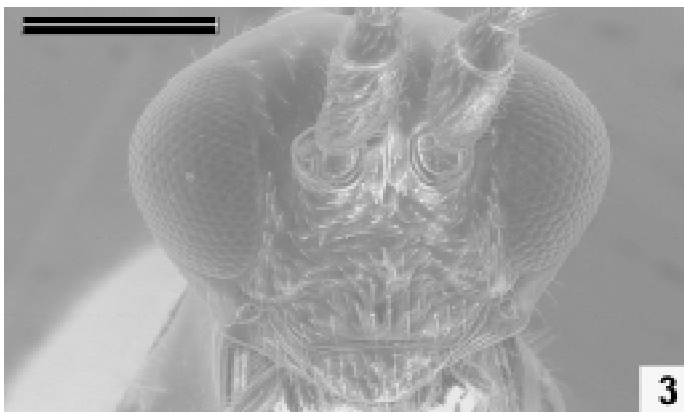
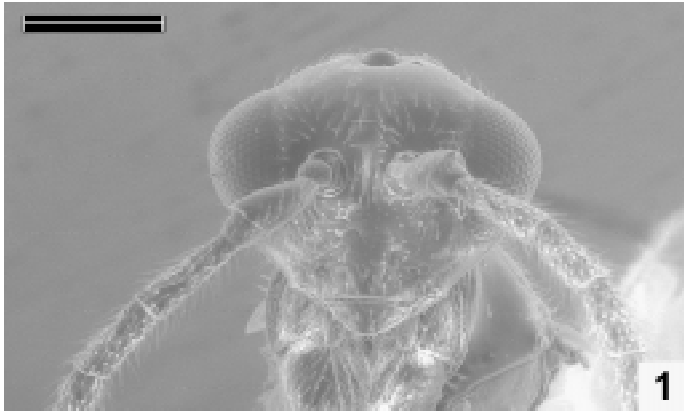
Exallonyx alticola Kieffer, 1913

Figs 1, 4, 10, 11, 18

Exallonyx alticola Kieffer, 1913: 20; Townes & Townes 1981: 297. (Type locality: Kenya)

Codrus longipetiolatus Sundholm, 1970: 307; Townes & Townes 1981: 298. (Type locality: South Africa)

Material examined: SOUTH AFRICA: *Free State*: 1♂, Adullam Farm near Clarens (28°34'S:28°28'E), 15–18.01.1986, B. Grobbelaar (PPRI-NCI); *Mpumalanga*: 1♂, Mac Mac Falls, 10 km N Sabie (25°02'S:30°48'E), 27.02.1986, B. Grobbelaar (PPRI-NCI); *Western Cape*: 1♂, Citrusdal, Olifants R., 3219CA, 6.x.1977, R.M. Miller (NMSA); 1♂, Brandfontein Res. (34°46'S:19°52'E), 16–18.x.1992, S. van Noort; 1♂ 1♀, Grootvadersbosch (33°52'30"S:20°52'30"E), 28–30.xii.1996, D. Larsen; 1♂, Grootvadersbosch (33°59'S:20°49'E), 1.i.2000, D. Larsen (SAMC); *KwaZulu-Natal*: 16♂ 7♀, Grande, 20.3 km 205° SW Underberg, 3–9.xii.2001, MT, S. van Noort; 3♂ 1♀, Hlogoma, 4.9 km 127° S Underberg, 4–10.xii.2001, MT, S. van Noort; 2♂ 1♀, Triscombe, 18.1 km 203° SW Underberg, 2–8.xii.2001, S. van Noort; 64♂ 51♀, Pineglades, 1.3 km 178°S Himeville, 3–9.xii.2001, S. van Noort; 1♀, Good Hope Estate, 9.3 km 281° NW Boston (29°41.7'S:29°55.9'E), 1350m, 25–30.viii.1998, MT, S. van Noort (SAMC); 3♂, Southern Drakensberg, Himeville, 3–5.iii.2004, YPT, V. Kolyada & M. Mostovski; 1♀, Impendle, Nhlosane farm (29°35'S:29°58'E), xi.1993, pitfall traps, J. Kotze; 4♀, same data except



Figs 1-3. *Exallonyx* male heads, frontal view. 1. *E. alticola*. 2. *E. subteres*. 3. *E. townesi* Kolyada, sp. n.
Scale bars = 200 μ m.

19.i–15.ii.1994; 2♂ 5♀, same data except 16.ii–29.iii.1994; 1♀, same data except 30.iii–12.iv.1994; 1♀ same data except 13.iv–31.v.1994; 1♂, same data except 1.vi–1.vii.1994; 1♀, Pietermaritzburg, Hilton (29°32'30.7"S:30°18'18.4"E), 1131 m, 27.ix–13.x.2003, MT, M. Mostovski; 1♂ 1♀, same data except 13–23.xi. 2003; 4♀, same data except 24.xi–9.xii.2003; 2♀, same data except 29.ii–13.iii.2004; 1♂, Pietermaritzburg, Town Bush, 15.ii.2004, sweeping, V. Kolyada & M. Mostovski; 1♂, Karkloof, near Braco Farm (29°19'S:29°19'E), 13–25.iii.2004, pitfall traps, V. Kolyada & M. Mostovski (NMSA).

Diagnosis: Female. Forewing 2.0–3.0 mm long. Gena as long as shortest diameter of eye. Second flagellomere 2.3 times as long as wide, tenth flagellomere 1.75 times as long as wide. Pronotum with epomia, with sometimes 1–3 setae behind epomia. Posteroventral corner of pronotum with two pits. Setal strip along dorsal side of pronotum consists of 2–5 setae. Ovipositor sheath 0.33 times as long as hind tibia, lacking longitudinal striation but having isolated punctures (Fig. 18).

Male. Forewing 2.0–3.0 mm long. Gena long, 0.5 times as long as shortest diameter of eye. Clypeus 2.5 times as long as wide. Tyloids present but poorly distinct. Second flagellomere 3.1 times as long as wide. Other characters as in female.

Remarks: The size of this species is highly variable, and some specimens can be nearly twice as long as others. The statement about a long petiole (Townes & Townes 1981) is not always correct, since this character is also variable.

Distribution: South Africa, Kenya. This species had been described from Kenya and was subsequently recorded in South Africa (Grahamstown, Kirstenbosch, and Pietermaritzburg).

Exallonyx leptocorsa Townes, 1981

Figs 5, 6, 12, 13, 19

Exallonyx leptocorsa Townes, 1981: 287. (Type locality: South Africa)

Exallonyx cingulatus Townes, 1981: 307. (Type locality: South Africa) **syn. n.**

Material examined: SOUTH AFRICA: *Western Cape*: 1♀, Cape Town, Kirstenhof (34°04.14'S:18°27.09'E), 15–27.v.1994, MT, S. van Noort; 1♀, same data except 23–25.viii.1994 (SAMC); *KwaZulu-Natal*: 1♀, Hlogoma, 4.9 km 127°S Underberg, 4–10.xii.2001, S. van Noort (SAMC); 3♂ 2♀, Southern Drakensberg, Himeville, 3–5.iii.2004, YPT, V. Kolyada & M. Mostovski; 1♂, Southern Drakensberg, Sani Pass (29°37'S:29°23'E), 4.iii.2004, YPT, V. Kolyada & M. Mostovski; 1♂, Pietermaritzburg, Hilton (29°32'30.7"S:30°18'18.4"E), 1131m, 24.xi–9.xii.2003, MT, M. Mostovski; 1♀, same data except 17–29.ii.2004; 1♂, Pietermaritzburg, Hilton, Winterskloof (29°35.27'S:30°17.91'E), 20–25.xii.2003, MT, C. Conway (NMSA).

Diagnosis: Female. Forewing 2.8–3.4 mm long. Gena 0.75 times as long as shortest diameter of eye. Second flagellomere 2.2 times as long as wide, tenth flagellomere 1.6 times as long as wide. Pronotum with interrupted epomia, without setae behind it. Posteroventral corner of pronotum with two pits. Setal strip along dorsal edge of pronotum consists of one or two setae. Propodeal sculpture noticeably rough. All coxae dark. Petiole short, as long as high or shorter, ventral face of petiole with several transverse ridges. Ovipositor sheath short, ca. 0.5 times as long as hind tibia, with distinct longitudinal striation.

Male. Forewing 2.5–3.0 mm long. Gena short, 0.3 times as long as shortest diameter of eye. Clypeus 2.9 times as long as wide. Second flagellomere 3 times as long as wide. Tyloids developed as poorly distinct rounded swellings. Petiole longer than high, its ventral face without transverse ridges. Other characters as in female.

Remarks: A comparison of SEM images of *E. cingulatus* (only females known) and *E. leptocorsa* in Townes and Townes (1981) revealed that these species are essentially identical, and like those of our specimens (Figs 5, 6, 12, 13). The Townes pictures are of the type specimens, so there was no need for us to re-examine the types themselves. Having a good series of specimens of both sexes clearly attributable to *E. leptocorsa*, the females of which show all the characters in the description of *E. cingulatus* also, leads us to conclude that a single species is involved. We therefore synonymise *E. cingulatus* under *E. leptocorsa*.

The presence of tyloids on the antennomeres (Townes & Townes 1981), is confirmed for the male of *E. leptocorsa*. They are present in other species as well (and apparently in all males of *Exallonyx*), but they become visible only in preparations when the antennae are cleared and become transparent.

Males of this species differ from *E. subteres* in having dark middle and hind coxae and from other species in having more conspicuous propodeal reticulation. Females differ from other species in having several well-defined transverse ridges on the petiole basoventrally.

Distribution: South Africa, Kenya. *E. leptocorsa* was described on the basis of four females and one male from Grahamstown (Townes & Townes 1981); *E. cingulatus* was described on the basis of four females from Magoebaskloof (near Tzaneen), Jonkershoek (near Stellenbosch), and Kenton-on-Sea.

Exallonyx subteres Townes, 1981

Figs 2, 7, 14, 15, 20

Exallonyx subteres Townes, 1981: 288. (Type locality: South Africa)

Material examined: SOUTH AFRICA: *Limpopo*: 1♂, Malta Forest near The Downs (24°10'S:30°14'E), 3–6.03.1986, B. Grobbelaar (PPRI-NCI); *KwaZulu-Natal*: 8♂ 2♀, Southern Drakensberg, Sani Pass (29°37'S:29°23'E), 2–5.iii.2004, MT, V. Kolyada & M. Mostovski; 7♂, Southern Drakensberg, Himeville, 3–5.iii.2004, YPT, V. Kolyada & M. Mostovski; 6♂ 7♀, Grande 20.3 km 205° SW Underberg, 3–9.xii.2001, MT, S. van Noort; 1♂, Hlogoma, 4.9 km 127°S Underberg, 4–10.xii.2001, MT, S. van Noort; 1♂, Triscombe, 18.1 km 203°SW Underberg, 2–8.xii.2001, MT, S. van Noort; 74♂ 14♀, Pineglades, 1.3 km 178°S Himeville, 3–9.xii.2001, MT, S. van Noort.; 6♀, Impendle, Nhlosane farm (29°35'S:29°58'E), 19.i–15.ii.1994, pitfall traps, J. Kotze; 4♀, same data except 16.ii–29.iii.1994; 5♀, same data except 30.iii–12.iv.1994; 1♂, same data except 13.iv–31.v.1994; 2♀, same data except 1.vi–1.vii. 1994; 1♀, Pietermaritzburg, Town Bush, xii.1977, MT, R.M. Miller; 11♂ 4♀, Pietermaritzburg, Hilton (29°32'30.7"S:30°18'18.4"E), 1131m, 27.ix–13.x.2003, MT, M. Mostovski; 3♂ 2♀, same data except 13–23.xi.2003; 2♂ 4♀, same data except 24.xi–9.xii.2003; 4♂ 3♀, same data except 10–23.xii.2003; 1♀, same data except 15–26.i.2004; 2♀, same data except 17–29.ii.2004; 2♀, same data except 29.ii–13.iii.2004; 1♀, Pietermaritzburg, Hilton,

Winterskloof (29°35.27'S:30°17.91'E), 20–25.xii.2003, MT, C. Conway; 1♂, Durban Metro, Kloof, 1–5.xii.2003, MT, D. Barraclough (NMSA).

Diagnosis: Female. Forewing 3.0–3.9 mm long. Gena 0.85 times as long as shortest diameter of eye. Second flagellomere 2.1 times as long as wide, tenth flagellomere 1.35 times as long as wide. Pronotum with well developed epomia and sometimes with one or two setae behind it. Posteroventral corner of pronotum with two pits. Setal strip along dorsal edge of pronotum consists of one or two setae. Propodeal sculpture heavily smoothed, sometimes almost absent. Petiole long and thin, with almost erased lateral wrinkles and noticeable dorsal depression (Fig. 15). Ventral face of petiole with one strong transverse ridge at base. Ovipositor sheath short, approx. 0.5 times as long as hind tibia, with longitudinal striation (Fig. 20).

Male. Forewing 2.9–4.0 mm long. Gena short, 0.4 times as long as shortest diameter of eye. Clypeus 3 times as long as wide. Second flagellomere 3.5 times as long as wide. Tyloids poorly distinct. Setal strip along dorsal edge of pronotum consists of 3–5 setae. Propodeal sculpture not heavily smoothed, clear. Petiole longer than wide, its ventral face without transverse ridges. Other characters as in female.

Distribution: South Africa. This species was described on the basis of a number of females from Magoebaskloof (near Tzaneen), Grahamstown, Karkloof (near Howick), Mpendle, Pietermaritzburg, and Royal Natal National Park (Townes & Townes 1981). This species is particularly abundant in elevated and forested areas.

***Exallonyx townesi* Kolyada, sp. n.**

Figs 3, 8, 9, 16, 17, 21

Etymology. This species is named after Henry K. Townes, whose input to the study of proctotrupids cannot be overestimated.

Type material: Holotype: female, SOUTH AFRICA: *KwaZulu-Natal*: Pietermaritzburg, Hilton (29°32'30.7"S:30°18'18.4"E), 1131m, 27.ix–13.x.2003, MT, M. Mostovski (NMSA). Paratypes: *Western Cape*: 1♀, Brenton-on-Sea, 19–26.xi.1997, pitfall traps, H.G. Robertson (SAMC); *KwaZulu-Natal*: 2♀, Impendle, Nhlosane farm (29°35'S:29°58'E), 19.i–15.ii.1994, pitfall traps, J. Kotze; 1♂ 6♀, same data except 16.ii–29.iii.1994; 1♂, same data except 30.iii–12.iv.1994; 1♀, same data except 13.iv–31.v.1994; 3♂, same data except 1.vi–1.vii.1994; 1♂, Pietermaritzburg, Hilton (29°32'30.7"S:30°18'18.4"E), 1131m, 13–23.xi.2003, MT, M. Mostovski; 1♀, same data except 24.xi–9.xii.2003; 1♀, same data except 10–23.xii.2003; 1♀, same data except 15–26.i.2004; 1♀, same data except 29.ii–13.iii.2004; 1♂ 1♀, Southern Drakensberg, Himeville, 3–5.iii.2004, YPT, V. Kolyada & M. Mostovski (NMSA); 2♂ 1♀, Grande 20.3 km 205° SW Underberg, 3–9.xii.2001, MT, S. van Noort; 1♂ 9♀, Hlogoma, 4.9 km 127° S Underberg, 4–10.xii.2001, MT, S. van Noort; 17♂ 4♀, Triscombe, 18.1 km 203° SW Underberg, 2–8.xii.2001, MT, S. van Noort; 13♂, Pineglades, 1.3 km 178° S Himeville, 3–9.xii.2001, MT, S. van Noort (SAMC).

Description: Female. Body black, antennae fuscous, base of scape fulvous below, pedicel, tegula, stigma, fore coxa, and legs yellowish brown; ovipositor sheath black with yellowish tint apically. Forewing length 2.0–3.2 mm. Head noticeably compressed laterally, prognathous, laterally 1.4 times as long as high. Clypeus about 2.2 times as wide as long, convex, free margin thin, weakly depressed and truncated. Temple about

2.7 times as wide as eye. Ratios of antennomere lengths to widths 2:1, 1:1, 1.7:1, 1.4:1, 1.4:1, 1.4:1, 1.4:1, 1.4:1, 1.4:1, 1.4:1, 1.25:1, 2.5:1. Lateral side of pronotum with one pit in posteroventral corner. Setal strip along upper edge of pronotum comprising one or two setae. Epomia complete and distinct, with no setae behind it. Mesopleuron with horizontal groove complete, mesopleural furrow foveolate, area below horizontal groove smooth. Radial vein entering costal vein at 45°. Propodeum abruptly sloping in profile, propodeal sculpture smoothed and even, dorsally with two large shiny patches reaching upper posterior margin. Lateral smooth area of anterior part of propodeum large, occupying about half of propodeum. Base of syntergite with one median groove reaching half the distance to first pair of thyridia and with two small furrows on each side of this groove. Ovipositor sheath 0.5 times as long as hind tibia, with small longitudinal wrinkles.

Male. Same as female but forewing length 2.0–3.4 mm, head not laterally compressed, hypognathous, laterally 0.8 times as long as high. Clypeus about 3 times as wide as long, weakly convex. Gena very short, 0.2 times as wide as eye, with furrow running from lower corner of eye toward base of mandibles. Ratios of antennomere lengths to widths 1.75:1, 1:1, 1.3:1, 1.3:1, 3:1, 2.7:1, 2.3:1, 2.3:1, 2.3:1, 2.3:1, 2.3:1, 2:1, 3.7:1. Antennomeres 4–11 bearing small oval tyloids, visible in cleared preparations only. Propodeum gently sloping in profile.

Comparison: This species differs from its African congeners in the presence of only one pit in the posteroventral corner of the pronotum (Figs 8, 9).

Remarks. Within the genus *Exallonyx*, Townes recognised formal species groups (Townes & Townes 1981). It seems that all other Afrotropical members of this genus belong to the species-rich *formicarius* group on the basis of having two pits in the posteroventral corner of the pronotum. However, we have seen specimens of other undescribed species from Tanzania with only one pit, besides *E. townesi*, so recognition of another group of species may become necessary.

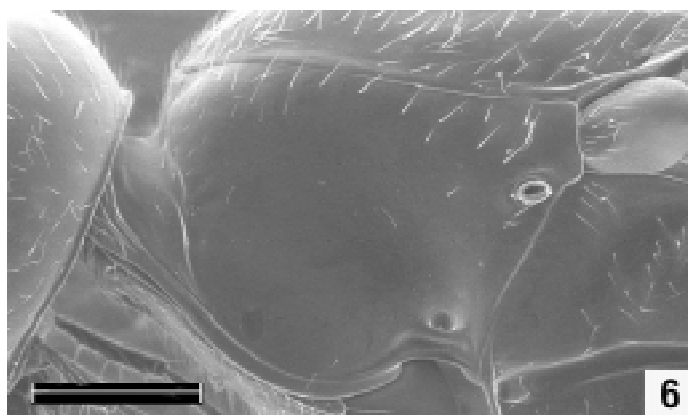
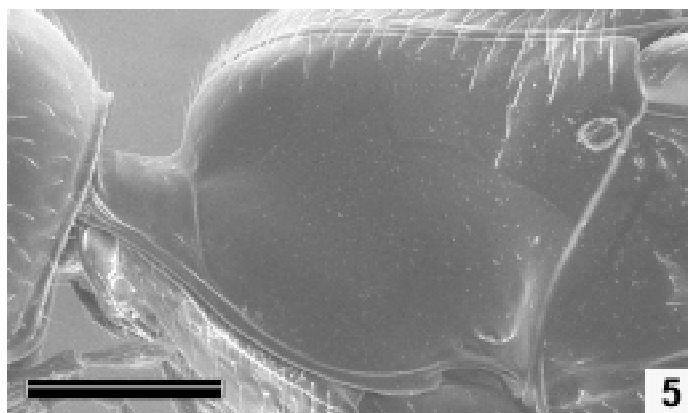
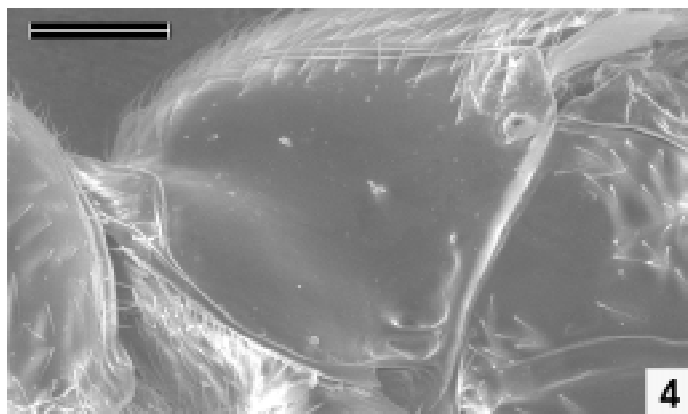
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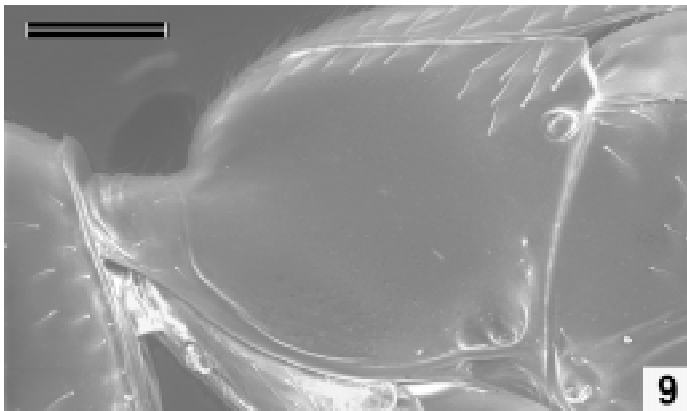
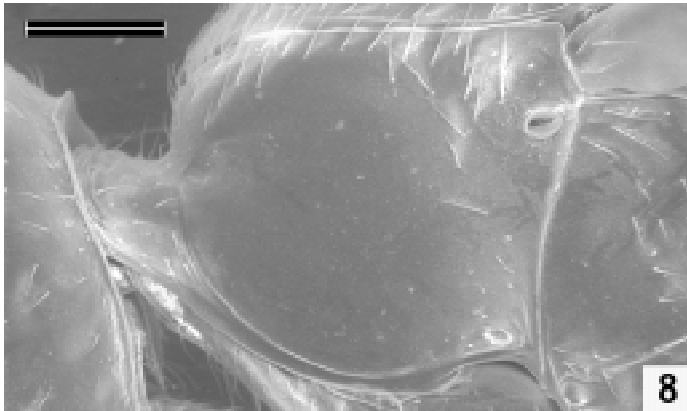
Our gratitude extends to Mrs B. White (Centre for Electron Microscopy, University of KwaZulu-Natal, Pietermaritzburg) for her help during many SEM sessions, to Dr J.C. Masters and Dr J.D. Plisko (both NMSA) for their help during field work, to Mrs C. Conway (NMSA), who kindly collected valuable material in her garden, to Dr S. van Noort (SAMC) and Mrs O. Naser (PPRI-NCI) for providing material in their care. Our special thanks are due to Prof. W. Pulawski (Californian Academy of Sciences, USA), Dr D.L.J. Quicke (Imperial College, Ascot, Berkshire, UK) and Dr J.G.H. Londt (NMSA) for their useful comments on the manuscript.

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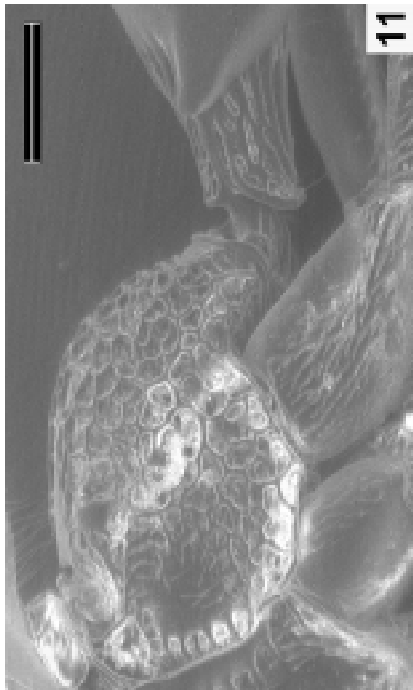
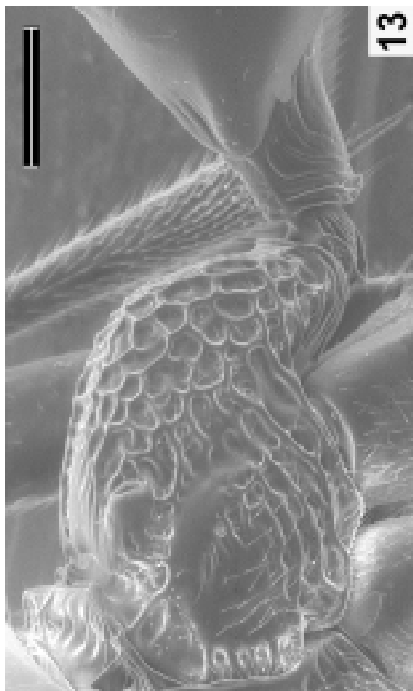
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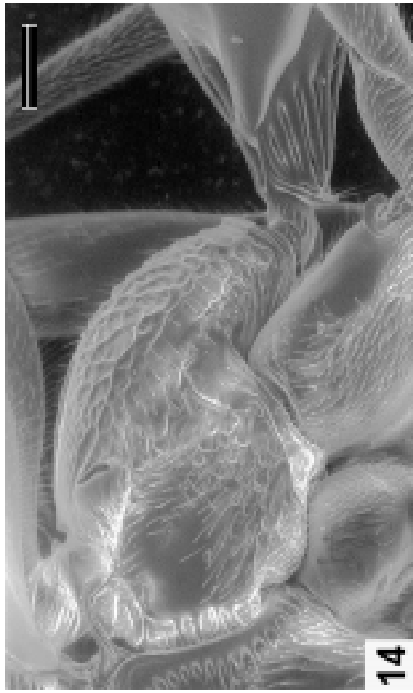
Figs 4-6. Pronota of *Exallonyx* species. 4. *E. alticola*, male. 5, 6. *E. leptocorsa*, male and female.
Scale bars = 100 μ m in Fig. 4 and 200 μ m in Figs 5, 6.



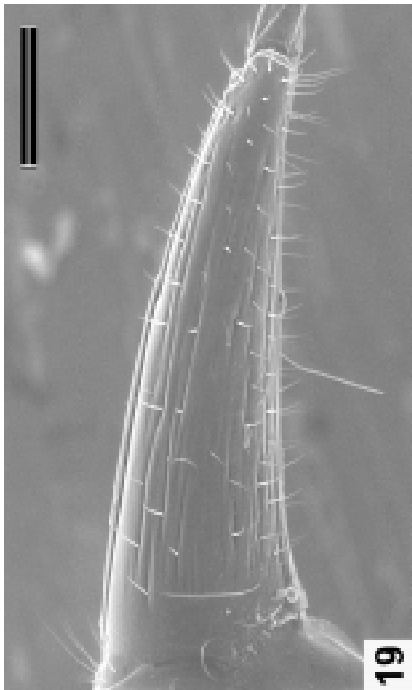
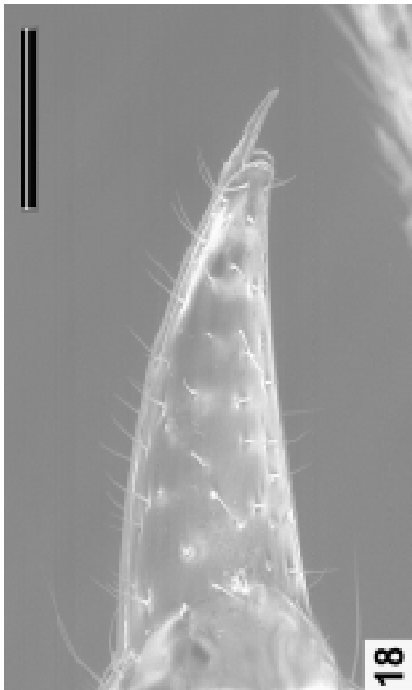
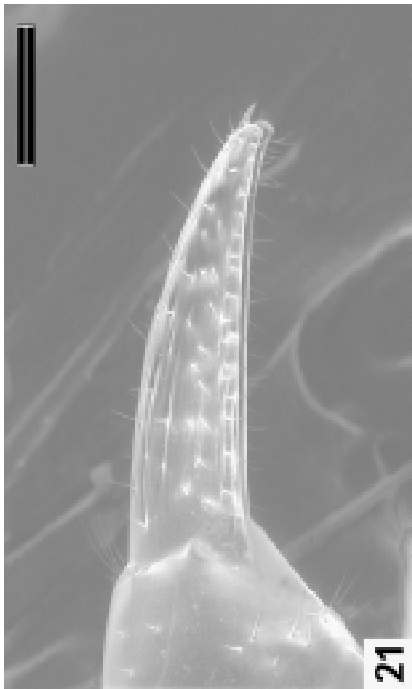
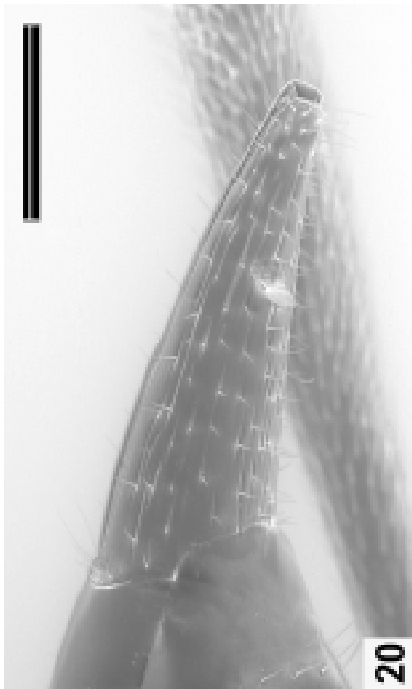
Figs 7-9. Pronota of *Exallonyx* species. 7. *E. subteres*, male. 8, 9. *E. townesi* Kolyada, sp. n., male and female. Scale bars = 200 μ m in Fig. 7 and 100 μ m in Figs 8, 9.



Figs 10-13. Propodeal sculpture and petiole of *Exallonyx* species. 10, 11. *E. alticola*, male and female. 12, 13. *E. leptocorsa*, male and female. Scale bars = 200 μ m.



Figs 14-17. Propodeal sculpture and petiole of *Exallonyx* species. 14, 15. *E. subteres*, male and female. 16, 17. *E. townesi* Kolyada, sp. n., male and female. Scale bars = 200 μ m.



Figs 18-21. Ovipositors of *Exallonyx* species. 18. *E. alticola*. 19. *E. leptocorsa*. 20. *E. subteres*. 21. *E. townesi* Kolyada, sp. n.
Scale bars = 100 μ m in Figs 18, 19, 21 and 200 μ m in Fig. 20.