

PARABUTHUS KALAHARICUS, A NEW SPECIES OF SCORPION FROM THE KALAHARI GEMSBOK NATIONAL PARK IN THE REPUBLIC OF SOUTH AFRICA (BUTHIDAE, SCORPIONIDA)

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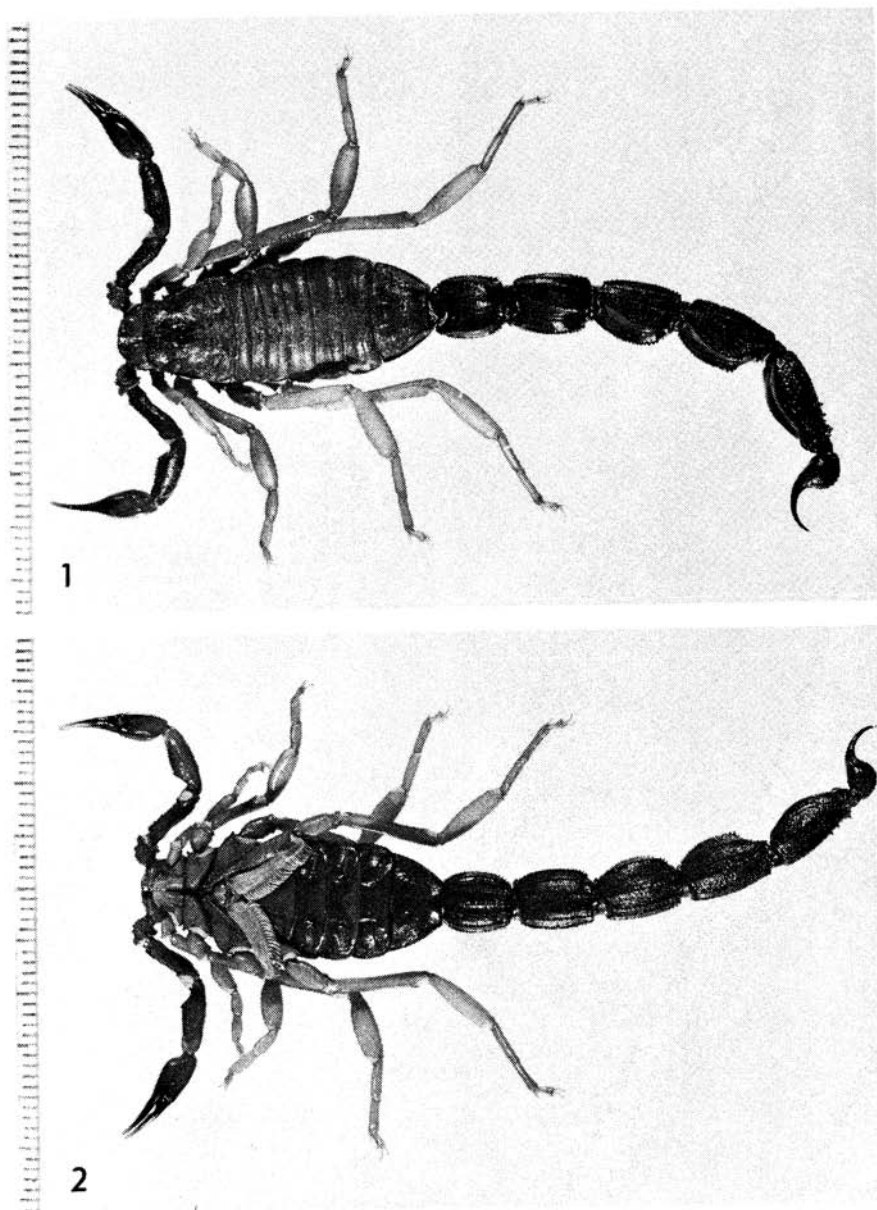
Abstract – A new species of scorpion *Parabuthus kalaharicus*, family Buthidae, is described from the Kalahari Gemsbok National Park, in the northern Cape Province of the Republic of South Africa. *P. kalaharicus* is most closely related to *P. granulatus* (H. & E., 1828) and a key separating the two species is provided

Family BUTHIDAE E. Simon, 1879
Subfamily BUTHINAE Kraepelin, 1899
Genus *Parabuthus* Pocock, 1890
Parabuthus kalaharicus sp. nov.

Diagnosis

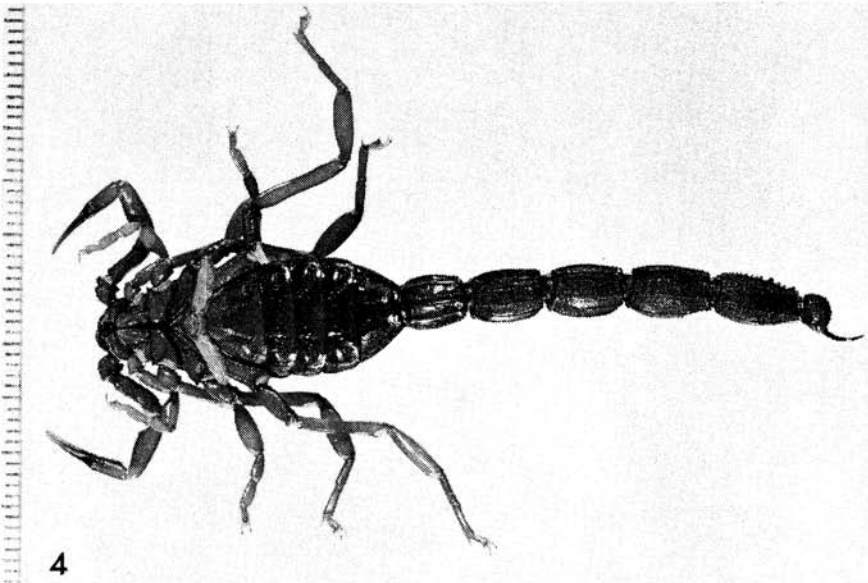
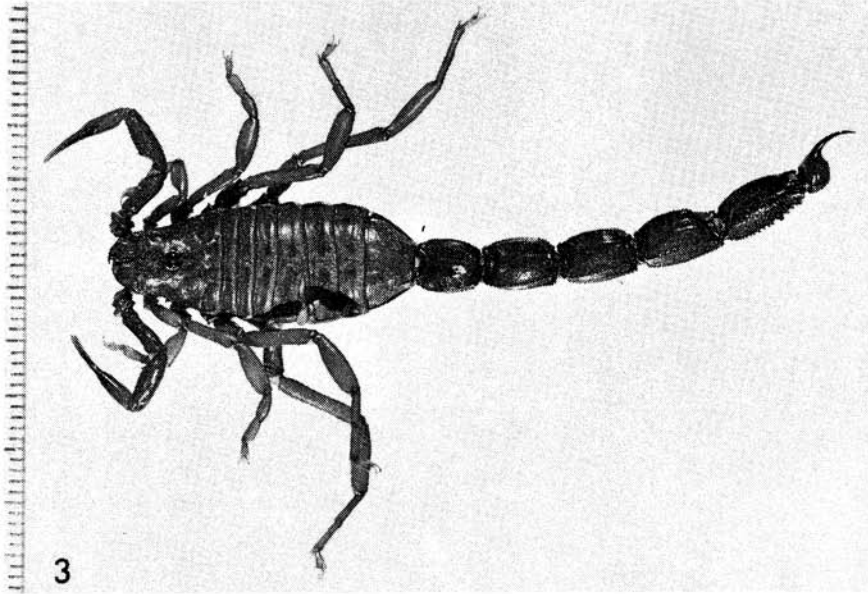
The following combination of characters separates *P. kalaharicus* from other species of the genus. Caudal segments (Figs 1–4): cauda IV, with six distinct granular keels, median lateral keel obsolete to absent, posterior three quarters of ventral keels obsolete; cauda I, dorsal stridulatory area fairly narrow, reaching posterior margin, finely shagreened cauda II, dorsal stridulatory area, narrow, poorly developed and not reaching posterior margin; cauda V, accessory dorsal crest absent, distal half of ventro-lateral keels composed of enlarged subspinose, and occasionally distally blunt, processes; adult ♂ & ♀, telson small, width 66% of cauda V width (range 61–71). Pedipalp chela (Fig. 5 a–c): mean movable finger length/hand back length ratio 1,60 for ♀ (range 1,55–1,65), 1,15 for ♂ (range 1,10–1,20) proximal dentate margin of fixed and movable fingers of ♂ distinctly emarginated as in Fig. 5 a, of ♀ linear as in Fig. 5 b; trichobothrium *db* almost level with *esb* in ♀ & ♂; trichobothrium *dt* either closer to *est* than *et* or medial, but never level with or distal to *et* as in most species of *Parabuthus* from southern Africa; trichobothrium *it* unusually proximal, level with fourth sub-terminal transverse row of enlarged teeth of dentate margin of fixed

finger. Pedipalp tibia (Fig. 5 e): trichobothrium *et* distinctly distal to *est*; trichobothrium *em* medial between *est* and *esb*₂. Pedipalp femur (Fig. 5 f): trichobothrium *d*₂ on proximo-dorsal side of dorso-internal keel; trichobothrium *d*₃ on distinctly distal to *d*₂ and closer to *d*₄ than *d*₁. Pectines (Figs 2 and 4): ♀, first proximal middle lamella of each pecten sub-oval with mesial margin arcuate (not enlarged and lobate) and not



Figs 1-2. *Parabuthus kalaharicus* sp. nov., holotype ♂ (N.M. 10945). 1, dorsal; 2, ventral. Scale in mm.

supporting any pectinal teeth, ♂, sub-rectangular with mesial margin angular and supporting 2-3 pectinal teeth; ♀ 18-20 and ♂ 22-27 teeth per pecten. Mean carapace length of adult ♂ 7,3 mm (range 6,7-7,9 mm). ♀ 7,9 mm (only 2 ♀ collected). *P. kalaharicus* is one of the medium-sized species of *Parabuthus* with total body length of adult ♀ & ♂ about one third shorter than those of *P. granulatus*. *P. kalaharicus* is



Figs. 3-4. *Parabuthus kalaharicus* sp. nov., paratype ♀ (N.M. 10946). 1, dorsal; 2, ventral. Scale in mm.

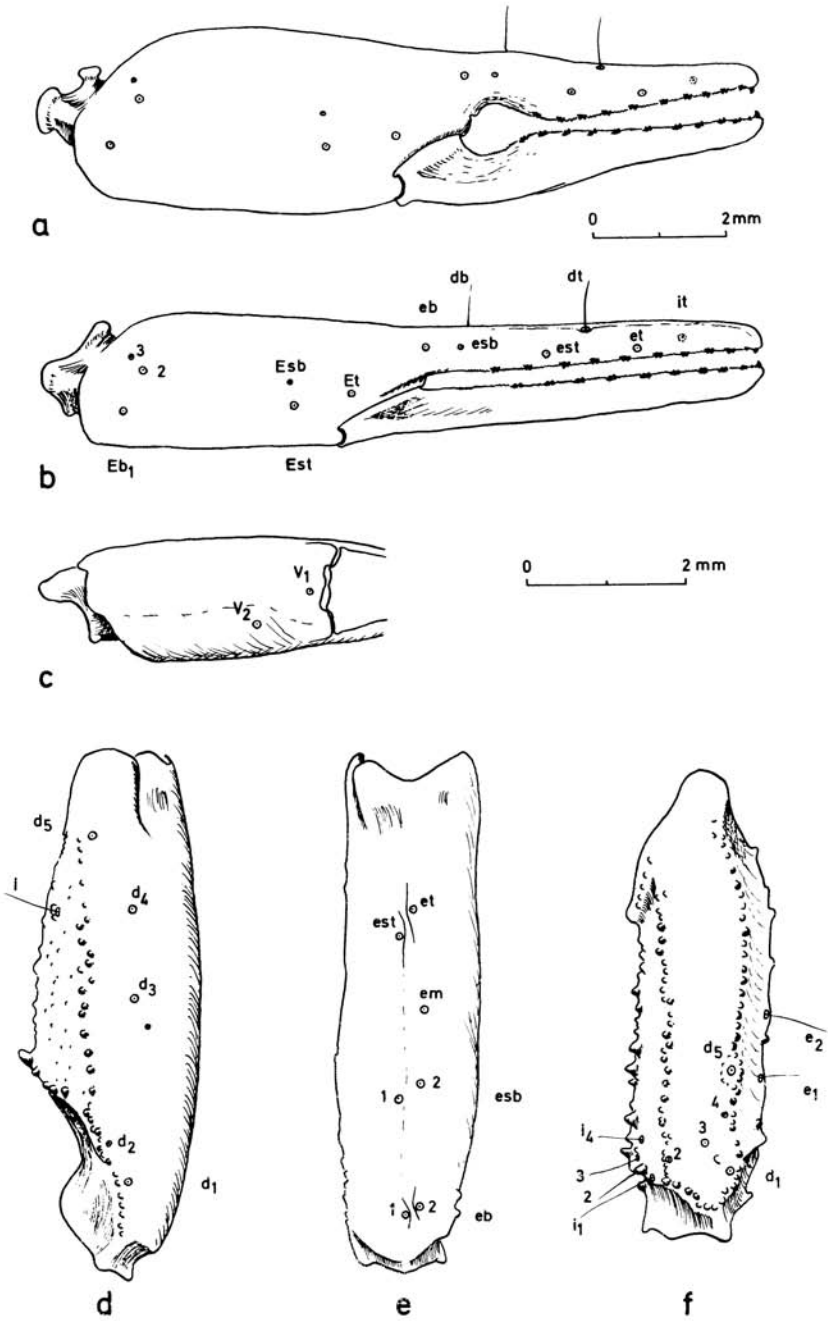


Fig. 5. *Parabuthus kalaharicus* sp. nov.: a, holotype ♂ (N.M. 10945); b-f, paratype ♀ (N.M. 10946). a & b, right pedipalp chela, outer aspect; c, right pedipalp chela, ventral aspect of hand back; d, right pedipalp tibia, dorsal aspect; e, right pedipalp tibia, outer aspect; f, right pedipalp femur, dorsal aspect. Scales: a, as indicated; b-f, all same scale, as indicated.

most closely related to *P. granulatus* (H. & E. 1828) (listed in Lamoral and Reynders 1975) from which it is separated by the differences in character states set out in the key provided below.

Key to *P. granulatus* and *P. kalaharicus*

1. Pedipalp chela: mean movable finger length/hand back length ratio 2,0 for ♀ (range 1,95–2,05), 1,55 for ♂ (range 1,50–1,60); trichobothrium *db* much closer to *est* than *esb* in ♀, almost medial in ♂; trichobothrium *dt* distal to *et*; trichobothrium *it* level with second subterminal transverse row of enlarged teeth of dentate margin of fixed finger. Pedipalp tibia: trichobothrium *et* almost level with *est*; trichobothrium *em* much closer to *est* than *esb*₂. Pectines: ♀ 22–30 and ♂ 28–36 teeth per pecten. Tergites I–VI, median keels present *granulatus* (H. & E., 1828)

Pedipalp chela (Fig. 5 a and b): mean movable finger length/hand back length ratio 1,60 for ♀ (range 1,55–1,65), 1,15 for ♂ (range 1,10–1,20); trichobothrium *db* almost level with *esb* in ♀ and ♂; trichobothrium *dt* either closer to *est* than *et* or medial, but never level with *et*; trichobothrium *it* level with fourth subterminal transverse row of enlarged teeth of dentate margin of fixed finger. Pedipalp tibia (Fig. 5 e): trichobothrium *et* distinctly distal to *est*; trichobothrium *em* medial between *est* and *esb*₂. Pectines ♀ 18–20 and ♂ 22–27 teeth per pecten. Tergites I–VI, median keels obsolete *kalaharicus* sp. nov.

Description

The type series consists of 194 males and two females. The following description is based on the ♂ holotype, unless otherwise indicated and supplements the above diagnosis and Figs 1–5.

Sexual dimorphism:

Holotype and paratypes. In adults, males differ very little from females except in the following characters: the mean movable finger length/hand back length ratio in ♂ is 0,45 lower than in ♀; the proximal dentate margin of fixed and movable fingers is distinctly emarginated in ♂ linear in ♀; ♂ have 22–27 and ♀ 18–20 teeth per pecten; the first proximal middle lamella of each pecten supports 2–3 teeth in ♂, none in ♀.

Male holotype:

Granulation: As in *P. granulatus*, but differing as following. Pedipalp chela, smooth and shiny. Tergites I–VI median keels obsolete. Lateral intercarinal surfaces of cauda I and lateral and ventral intercarinal surfaces of cauda II–V, finely and evenly granulated; cauda IV, posterior three quarters of ventral keels obsolete.

Colour: Colour given using the ISCC-NBS Colour Designation (Kelly and Deane 1965). Body and appendages, excepting legs and pectines, deep brown No. 56 with tergites and carapace dark brown No. 59; distal portion of pedipalp chela handback and proximal half of fixed and movable fingers, distinctly infuscated; legs and pectines, deep orange-yellow No. 69.

Pectines: ♂ with mean of 25 teeth (range 22–27 for 187 specimens examined) and ♀ 19 teeth (range 18–20 for 2 specimens examined) per pectine. First proximal middle lamella of each pectine in ♀ not enlarged and lobate as in most species of *Parabuthus*.

Sternum: Sub-triangular and elongate, twice as long as wide.

Setation: As in *P. granulatus*, sparsely pilose with cauda virtually apilose.

Trichobothria: as in Fig. 5 a–f for ♂ and ♀. One of the two ♀ paratypes (N.M. 10946) has an additional small trichobothrium on the dorsal surface of the right tibia only, situated just proximally to d_3 (see Fig. 5d); this is unusual and has not been found in any of the other types.

Paraxial organ: paraxial organ and hemispermatophore as in *P. granulatus*.

Variation

Mainly in overall coloration and degree of infuscation. Overall coloration either darker or lighter than holotype. In some paratypes cauda IV, V and telson are lightly infuscated. In subadults, the telson varies from deep brown to deep orange-yellow. These colour variations occur within samples of populations from all available localities.

Measurements

See diagnosis and Figs 1–5.

Type material

Holotype and paratypes in Natal Museum collection. Series of four paratypes from N.M. 10439 & 10455 have been deposited in each of the following institutions: South African Museum, Cape Town; Transvaal Museum, Pretoria; Kalahari Gemsbok National Park Museum; Museum National d'Histoire naturelle, Paris, France; British Museum (Natural History), London, England; Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, U.S.A.; California Academy of Sciences, San Francisco, U.S.A.

Material examined

Holotype ♂, Kalahari Gemsbok National Park, March 1970, B.

Lamoral (N.M. 10945, type no. 2104). Paratypes: 2♀, Twee Rivieren, March 1970, B. Lamoral (N.M. 10946, type no. 2105); 80♂, Twee Rivieren, March 1970, B. Lamoral (N.M. 10439, type no. 2106); 9♂, Sterkstroom farm, (25°43'S, 19°19'E), South West Africa, 19 March 1969, B. Lamoral (N.M. 10947, type no. 2106); 29♂, Mata Mata, 24 April 1970, B. Lamoral (N.M. 10948, type no. 2106); 4♂, Twee Rivieren, March 1970, B. Lamoral (N.M. 10452, type no. 2106); 1 juvenile ♂, Mata Mata, 27 April 1970, B. Lamoral (N.M. 10453, type no. 2106); 70♂, Twee Rivieren, 1960–1970, le Riche family and staff (N.M. 10455, type no. 2106).

Distribution

Kalahari Gemsbok National Park and south eastern part of South West Africa.

Bionomics

P. kalaharicus is nocturnal, hemiedaphic and digs shallow burrows at the base of shrubs and under rocks on sandy to gritty soils in the shallow interdune valleys of the Kalahari sand dunes system. Sweep-like rows of setae on the posterior edges of tibia, protarsi and tarsi of legs I–II and to a much lesser extent III, indicate a semi-psammophilous adaptation. *P. kalaharicus* and its most closely related species *P. granulatus*, are sympatric in the Kalahari Gemsbok National Park.

Acknowledgements

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