



Taxonomic revision of the southern African genus *Pachyphymus* Uvarov, 1922 (Orthoptera: Acridoidea: Euryphyminae)

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Abstract

The southern African endemic genus, *Pachyphymus* Uvarov, 1922 (Orthoptera: Acrididae: Euryphyminae), is the only genus in the Euryphyminae subfamily with enlarged and hump-shaped pronotal crests. Here, we redescribe two species using newly evaluated diagnostic characters: *P. carinatus* Dirsh, 1956 and *P. cristulifer* (Serville, 1838); and describe two new species: *P. samwaysi* n. sp. and *P. namaquensis* n. sp. Of the 23 genera of Euryphyminae, *Pachyphymus* is arguably the most morphologically distinct. However, the species of *Pachyphymus*, like those of the other Euryphyminae, are difficult to distinguish morphologically because of a high degree of intraspecific variation. Height and shape of the pronotal crests and rugosity of the pronotum were previously considered diagnostic but are strongly variable within species. Degree of infumation of the hind wing is strongly conserved and is the single best diagnostic character in most cases. However, one population of *P. cristulifer*, which is isolated from the mainland population by a mountain range, shows very little conservation in this character. Additionally, one population of *P. namaquensis* and one population of *P. cristulifer*, both from outlying regions of their geographic range have intermediate wing infumation as well as other morphological characters. This may indicate recent or ongoing hybridization or divergence of the geographically overlapping species. This study emphasizes the need for molecular analysis to complement detailed morphological diagnosis of the species of Euryphyminae, a notoriously under-studied and taxonomically problematic group.

Ke ywords: Orthoptera, Euryphyminae, South Africa, Succulent Karoo, Nama Karoo, Fynbos

Introduction

The Euryphyminae (Orthoptera: Acrididae) include 23 genera and approximately 90 species, 80% of which are endemic to southern Africa. Many of the species are specialized to southern Africa's arid regions such as the Karoo and Kalahari semi-deserts, and are often the most abundant insects encountered in these regions. They are found on open ground or at the base of shrubs in habitats ranging from bare, gravelly or rocky with very sparse vegetation, to habitats with thick, scrubby fynbos vegetation. The Euryphyminae are notoriously difficult to catch because of their sparse habitat which provides them with good visibility of oncoming predators. When a predator is spotted, Euryphyminae either stand still to avoid detection and blend into their surroundings or quickly and agilely jump away.

Male Euryphyminae have species-specific, complex, three-dimensional cerci, and a jointed epiphallus. Most Euryphyminae are relatively small to medium-sized in comparison with other South African grasshoppers (body length: 15–28 mm), often robust, brachypterous or macropterous, have colorful or banded hind wings, and hind femora which are colored black internally at sexual maturation in both sexes. Their integument is often darkly-colored and mottled, providing camouflage with their bare and gravelly environments. The flashy colors of the hind wings and internal hind femora stand out against the dark-colored background and are used for intraspecific communication, most likely in order to attract mates.

- and the other two at lateral edges of plate. Female subgenital plate with large, obtuse, median lobe which is often notched at apex, and two smaller lateral lobes *carinatus* Dirsh
- Hind wing infumation dark and distinct, covering 50–100% of wing surface. Male supraanal plate with two tubercles along either side of median concavity. Female subgenital plate distinctly trilobate with median lobe acute. 3
- 3 Hind wing completely or close to completely infumated. May have slight, indistinct interior hue from pink to purple. Male cercus short, robust and blunt when viewed laterally. Female subgenital plate distinctly trilobate with shallow, obtuse indentations between lobes and lateral lobes sloping gently. *namaquensis* n. sp.
- Hind wing with large degree of infumation (50–70% of surface of wing) but distinct internal area without infumation. Internal area usually bright pink, unless specimens originates from West of the Cederberg Mountain range, in which case wing interior may vary from pink to white. Male cercus elongate with pointed apex. Female subgenital plate trilobate with all lobes acute and deep, acute indentations between lobes *crisulifer* (Serville)

Acknowledgements

Specimens and photographs of specimens were loaned by the following individuals and institutions: G. Beccaloni (BMNH photos), D. Otte (BMNH and SANC photos), R. Urban (SANC specimens), M. Cochrane and D. Larsen (SAMC specimens). H.D. Brown collected most of the specimens used in the analysis and housed at the SANC. SANParks and Northern Cape Province, South Africa, granted permission to sample within their holdings. C. Tucker assisted with photography and B. Bamberger assisted with image processing in CorelDraw. Funding was provided by Ernst Mayr Travel Grants in Animal Systematics, Orthopterists' Society Small Grants, and the Mauerberger Foundation Fund.

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