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A taxonomic revision of the genus *Pauridia* (Hypoxidaceae) in southern Africa

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Abstract

Pauridia, a genus confined to southern Africa, Australia, Tasmania and New Zealand, is distinguished from other genera of Hypoxidaceae by the synapomorphic mucilage canals above the vascular bundles of the leaves and the disulcate, microechinate pollen grains, apart from the secondarily derived trisulcate state in one of the Australian species. The majority of species (86%) are endemic to southern Africa, mostly in seasonally damp sites within the winter rainfall and all-year-round rainfall regions of Namibia and South Africa. The Australian, Tasmanian and New Zealand taxa were revised by Henderson (1987) and the African taxa were revised by Nel in 1914. The difficulties of applying Nel's classification to the wealth of new material collected within the last century duly prompted a revision of *Pauridia* in southern Africa. Thirty species and three subspecies are recognised in this work, which includes a key to the species and full descriptions of all the southern African taxa, together with the updated nomenclature, geographic distribution, discussion on diagnostic characters and putative relationships

of each. Four new species, *P. breviscapa*, *P. maryae*, *P. monticola*, and *P. pudica* and two new subspecies, *P. monticola* subsp. *nubigena*, *P. gracilipes* subsp. *speciosa* are described and illustrated, adding to the four other southern African species described subsequent to Nel's revision. *P. acida*, a high altitude species that appears to flower after fire, remains poorly understood and one taxon, though almost certainly distinct, has been left unnamed until more complete material becomes available. The study of morphology, leaf anatomy and seed micromorphology suggests that the floral bracts and seeds are most helpful in revealing putative relationships among species. These characters are nevertheless insufficiently discrete to allow the recognition of formal infrageneric taxa. The northwestern and southwestern Cape has the highest concentration of species and according to IUCN criteria is home to three Endangered species (*P. canaliculata*, *P. maximiliani*, *P. pygmaea*) and two Vulnerable species (*P. alba*, *P. linearis*), found mainly in the lowland areas where natural habitats have been extensively fragmented.

Key words: distribution maps, illustrations, morphology, new taxa, systematics

Introduction

Pauridia Harvey (1838: 341), within Hypoxidaceae (Asparagales), is a relatively small genus of about 35 species located in southern Africa, Australia, Tasmania and New Zealand. The genus is most richly represented in southern Africa, leaving the remaining areas with relatively few species. Although not common amongst the petaloid monocotyledons, this distribution pattern is shared by *Bulbine* Wolf (1776: 84) and *Bulbinella* Kunth (1843: 569), within Xanthorrhoeaceae (Asparagales), and *Wurmbea* Thunberg (1781: 18) within Colchicaceae (Liliales).

Whereas a modern taxonomic account of all five Australian species of *Pauridia* [see *Hypoxis* sect. *Ianthe* Salisb. ex Baker (1878: 99) Bentham in Bentham & Hooker (1883: 717)] is available (Henderson 1987), the African members of the group have a history of taxonomic neglect and the naming of recently collected plants has become increasingly difficult.

This taxonomic study brings together data on morphology, leaf anatomy and seed micromorphology for a revision of *Pauridia* in southern Africa. Thirty species and three subspecies are covered, of which the majority are endemic or near endemic to the winter rainfall and all-year rainfall regions of Namibia and South Africa. Only one species, *P. verna*, is found exclusively in southern Africa's summer rainfall region, on the high escarpment of the Drakensberg. Most of the southern African species flower in late winter and spring, seven species flower in autumn and one species, *P. verna*, flowers in early summer. With few exceptions the favoured habitats are seasonally damp sites.

Taxonomic history

Pauridia has been variously treated since it was first established in 1838 (Harvey 1838: 341). For more than a century it remained a monotypic genus until a second species was added by Thompson (1972a: 163). In the original protologue, Harvey (1838) provided sound reasons for placing the genus within Hypoxidaceae, but some authors (Engler & Prantl 1887, 1930, Phillips 1951) subsequently placed it within Haemodoraceae due to the flowers having three rather than six stamens. Many others (Baker 1878, Dyer 1976, Hutchinson 1959, Takhtajan 1985), however, remained in agreement with Harvey (1838) and retained *Pauridia* in Hypoxidaceae, a classification upheld more recently by molecular phylogenetic studies (Rudall *et al.* 1998, Kocyan *et al.* 2011).

After new data on the southern African genus *Saniella* Hilliard & Burt (1978: 70) came to hand, the relationships of *Pauridia sensu stricto* to other taxa within Hypoxidaceae could be reassessed. Using morphological characters, Burt (2000) was able to infer the close relationships between *Pauridia sensu stricto*, *Spiloxene* Salisbury (1866: 44) and *Saniella*, thereby adding to his earlier comment that the Australian species *Hypoxis glabella* Brown (1810: 289), and by inference all taxa within *Hypoxis* sect. *Ianthe* (Salisb. ex Baker) Benth., should be transferred to *Spiloxene* as well (Hilliard & Burt 1978). All these taxa comprise cormous, glabrous herbs, unlike plants of *Hypoxis sensu stricto* which invariably have a vertical rhizome and a pubescent covering, at least on the backs of the tepals.

Ongoing doubts about maintaining *Pauridia sensu stricto*, *Spiloxene*, *Saniella* and the Australian, New Zealand and Tasmanian species of *Hypoxis* sect. *Ianthe* in separate genera stemmed from several striking similarities between these taxa. The flowers of *Pauridia sensu stricto*, like those of *Saniella*, have a cup-shaped

The corms of these collections have small softly fibrous to almost fibreless corms and linear leaves, but they appear to be bifacial and firm-textured rather than subterete and succulent as given by Nel (1914). Based on the characters of the corm and leaves, Nel placed *P. acida* (as *Ianthe acida*) in his *Aquaticae* group. To fully resolve the identities of these plants further collecting near the summits of the Cape Fold Mountains of the southern Cape during the summer months is necessary.

***Pauridia* sp.**

SOUTH AFRICA. Northern Cape: Groot Pellaberg, southern slopes (QDS: 2919AA), 3 May 1988, *E.J. van Jaarsveld* 9805 (NBG!).

One small collection by Ernst van Jaarsveld from the Groot Pellaberg, Northern Cape of two partial leaves and inflorescences, probably from a single plant, seems to represent an undescribed species allied to *Pauridia scullyi*. Like *P. scullyi* the leaves are thin-textured and the inflorescences have two or three yellow flowers. The filaments, however, are longer than the anthers and the style is about as long as the stigma branches, unlike *P. scullyi* in which the filaments are shorter than the anthers and the style is at most one third the length of the stigma branches. The plants also appear to flower in May, two months in advance of the spring-flowering *P. scullyi*. Although the only known seeds are immature, these appear to be covered by blunt, peg-like tubercles that give the testa a spikey appearance. The plants are recorded as common on the upper southern slopes of Groot Pellaberg in Bushmanland, but to date only this single collection is known. Additional material is still needed to adequately assess whether the plant warrants formal description.

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