

A revision of the genus *Marlothiella* (Apiaceae)

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Abstract

Marlothiella gummifera is a small perennial shrublet endemic to the Skeleton Coast of Namibia. Surprisingly it was found that the general fruit morphology agrees with that typically found in Saniculoideae and other basally diverging taxa. It is remarkable in the combination of a compound umbellate inflorescence, slightly heteromorphic fruits and dispersed crystals (typical of basally divergent genera of the subfamily Apioideae) with several characters typical of the subfamily Saniculoideae: large rib ducts, no vittae, unicellular stellate trichomes (not yet observed in any other genus of the family), and ventral vascular bundles that are poorly developed or absent. New insights into the morphology and possible systematic affinities of this poorly known monotypic genus are presented, together with a detailed taxonomic revision.

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1. Introduction

During routine carpological studies of the African genera of Apiaceae, a surprising discovery was made that the monotypic Namibian endemic *Marlothiella* H. Wolff completely lacks vittae and rather has large rib oil ducts (the intrajugal oil ducts of *Drude*, 1898). The implication is that the genus does not belong to the subfamily Apioideae but that it is more likely related to the subfamily Saniculoideae. It became clear that a detailed analysis of this interesting and anomalous genus was an urgent priority, in view of numerous studies that are currently underway to devise a new familial and infrafamilial classification system for the Apiaceae (e.g., Plunkett et al., 1996, 1997; Downie and Katz-Downie, 1999; Downie et al., 2001; Plunkett, 2001; Valiejo-Roman et al., 2002; Chandler and Plunkett, 2004; Lowry et al., 2004; Plunkett et al., 2004). *Marlothiella* was not yet known at the time, but the system of *Drude* (1898), com-

prehensive and useful as it may have been, made no provision for the lesser known African genera such as *Lichtensteinia* and *Steganotaenia*. As a result, several of them would not be identified to the correct subfamily in *Drude's* key. Previous studies of the monotypic genus *Marlothiella* (Wolff, 1912; Engler, 1921; Schreiber, 1967; Dyer, 1975; Burt, 1991; Van Wyk, 2000) have been somewhat superficial, and rigorous morphological and anatomical observations were necessary for a revision of the genus and to assist in interpreting future molecular results.

The purpose of this paper is therefore to provide a detailed study of the morphology and especially the fruit structure of *Marlothiella* to determine if characters can be found to support the notion that the genus is misplaced not only in the tribe Apieae (Pimenov and Leonov, 1993) but indeed in the subfamily Apioideae.

2. Materials and methods

Leaves, bracts, bracteoles, flowers and mature fruits of *Marlothiella gummifera* were rehydrated prior to photographing and drawing. Voucher specimens (also listed in the figure captions) included *Dinter* 6347 (PRE), *Marloth* 5360 (PRE), *Merxmüller & Giess* 2344 (WIND), *Merxmüller and Giess* 28330 (PRE) and *Range* 1742 (BOL). Portions of the leaf blades and petioles and

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Fig. 1. Herbarium specimen of *Marlothiella gummifera* showing the woody branches, thick, subsucculent leaves and short compound umbels.

some mature fruits were placed in FAA for a minimum of 24 h after rehydration and then treated according to the method of Feder and O'Brien (1968) for embedding in glycol methacrylate (GMA). A Porter-Blüm ultramicrotome was used to cut transverse sections, about 5 μm thick, and the periodic acid-Schiff/toluidine blue staining method (Feder and O'Brien, 1968) was used. Suitable sections were photographed and drawn. The terminology used is illustrated in the figures.

3. Results

3.1. Vegetative morphology and anatomy

The plants are cushion-shaped shrublets up to 0.4 m high and spreading to a width of 1 m when growing in sheltered places. They are gnarled, densely leafy and subsucculent (Fig. 1). The older stems are woody and have a smooth, pale brown surface.

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