



On the recognition of varieties in the grammitid fern genus *Melpomene* (Polypodiaceae)

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Abstract

In a recent revision of the genus *Melpomene* several wide-spread species have been recognized to display a greater morphological variability than their congeners. In order to facilitate the discussion of the regional variability, several varieties are here newly described: *Melpomene flabelliformis* var. *tepuiensis* from the Guyana Highlands; *M. moniliformis* var. *adnata* from Central America and the northern Andes; *M. moniliformis* var. *minor*, a dwarfed form occurring throughout the range of the species; *M. moniliformis* var. *subdicarpa* from southeast Brazil; *M. pilosissima* var. *tsatchelae* occurring throughout the range of the species; *M. xiphopteroides* var. *acrodontia* from Bolivia and southeast Brazil.

Key words: Andes, Bolivia, Brazil, *Grammitis*, Guyana shield, intraspecific variability, Mesoamerica, varieties

Introduction

The grammitid ferns include ca. 750 species that form a distinct clade within the Polypodiaceae (Parris 1997b, Schneider *et al.* 2004). Anatomically they differ from the rest of the Polypodiaceae by having exclusively chlorophyllous spores (only an exceptional trait in non-grammitid Polypodiaceae) with originally trilete laesures, but sometimes reduced to the monolete condition as in non-grammitid Polypodiaceae (Parris 1990, Schneider *et al.* 2004). Furthermore, they are predominantly smaller than other Polypodiaceae, largely lack articulate petioles and phyllopodia, and have a reduced number of vascular bundles per petiole (1–2 *vs.* 1–many in non-grammitid Polypodiaceae). Grammitid ferns are distributed pantropically, with a few species in adjacent moist subtropical and south-temperate regions. The majority occur epiphytically, as relatively few species are also found growing on rocks or terrestrially (Parris 1990).

The delimitation of genera within the grammitid ferns has been controversial, with authors recognizing one to eight genera (Parris 1990). In most cases, the genera were defined by artificial characters, which hampered the revision of natural groups but at least allowed some sort of classification. After the number and quality of specimens had increased significantly during the second half of the 20th century, a new attempt was undertaken to circumscribe natural genera of manageable sizes (Bishop 1974, 1977, 1978, 1988, 1989a, 1989b, 1989c, Bishop & Smith 1992, Smith 1992, 1993, Smith & Moran 1992, Smith *et al.* 1991, Parris, 1997a, 1997b, 1998, 2007, Murillo & Smith 2003). In contemporary times phylogenetic studies tested the generic concepts and found many of them to be based on homoplastic characters (Ranker *et al.* 2004).

Melpomene is one of the morphologically defined genera that were confirmed to be natural by molecular data (Ranker *et al.* 2004, Lehnert *et al.* 2009). It is characterized by having clathrate rhizome scales with clavate cells along the margins (or at least at the apices), dorsiventral rhizome anatomy, and secondary metabolites that result in a sweet, pungent smell in most species (Smith & Moran 1992, Lehnert 2008). The genus is almost exclusively neotropical except for one species, *Melpomene flabelliformis*, that also occurs in Africa, Madagascar and the Mascarene Islands (Smith & Moran 2001).