



A revision of the genus *Leontodon* (Asteraceae) in the Azores based on morphological and molecular evidence

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Abstract

Two endemic species of *Leontodon* are currently recognized in the Azores archipelago: *Leontodon filii* and *L. rigens*. However, there has been confusion regarding the application of these names and field observations and herbarium studies suggested three morphotypes in the islands. Here, we present a taxonomic revision of the Azorean endemic *Leontodon* species using morphological characters and new molecular data from the ITS region and from three chloroplast regions: *trnQ*, *trnV* and *matK*. Fifty-one quantitative and qualitative morphological characters were examined that revealed consistent differences between specimens from the western, central and eastern subarchipelagos (where, on the latter, *Leontodon* is restricted to São Miguel). Molecular analysis revealed two well defined monophyletic groups, one comprising accessions from São Miguel and the second comprising accessions from the western group, while central group accessions were in an unresolved polytomy. Both analyses also indicated the occurrence of hybridization with *L. saxatilis*, a widespread non-endemic species. Taken together, molecular and morphological data suggest the reinstatement of a third Azorean *Leontodon* taxon endemic to the western group. A key to the *Leontodon* of the Azores and descriptions of the endemic taxa are provided.

Key words: *Leontodon hochstetteri*, Asteraceae, phylogeny, morphology, island endemic

Introduction

The genus *Leontodon* Linnaeus (1753: 798) subg. *Leontodon* Widder (1931: 146) comprises c. 40 species with a distribution centred in the Mediterranean area and extending into North Europe and South West Asia (Hand *et al.* 2013). A molecular phylogenetic study by Samuel *et al.* (2006) confirmed that the European and Anatolian-Caucasian *L. hispidus* Linnaeus (1753:799) group (Meusel and Jäger 1992), and *L. kulczinskii* Popov & Chrschanovski (1949: 299), from the East Carpathians, belong to section *Leontodon* Widder (1975: 26), which is morphologically characterized by single capitula on simple leafless stems. However, this section is also considered to include the Azorean endemic *Leontodon* species, with multiple capitula on bracteate stems (Paiva & Ormonde 1972, 1974; Lack 1981). The *Leontodon* species currently listed as endemic to the Azores archipelago (Silva *et al.* 2010) are *L. filii* (Hochst. ex Seub. 1844: 34) Paiva & Ormonde (1972: 447), and *L. rigens* (Dryand. in Aiton 1789: 127) Paiva & Ormonde (1972: 448). These species were previously considered to belong to *Crepis* Linnaeus (1753: 805), *Microderis* DC. (1838: 127) and *Picris* Linnaeus (1753: 792), until Paiva & Ormonde (1972; 1974) placed both species in *Leontodon*, with the degree of floral stem ramification and the number of capitula the key discriminating traits between the two taxa. The first molecular phylogenetic analysis including Azorean *Leontodon* was conducted by Samuel *et al.* (2006) who confirmed the inclusion of *L. rigens* in section *Leontodon*. *Leontodon filii* was not included in that study.

The two Azorean *Leontodon* species have been historically listed as co-habiting the same locations on several of the Azorean islands, with the exception of Corvo, where only *L. rigens* was recorded, and Graciosa and Santa Maria, where both species were considered as absent (Azores Biodiversity Portal 2008). In the most recent checklist for the Azorean vascular flora (Silva *et al.* 2010), *L. filii* was listed as present in Pico, São Jorge, and Terceira, but doubtful in Faial and São Miguel islands, while *L. rigens* was considered to occur in São Miguel and doubtful in Pico and Terceira. *Leontodon* populations on Flores and Corvo were not listed as *L. rigens*, because the authors had come to the