



The Peruvian species of *Cristaria* (Malveae, Malvaceae): taxonomic revision, chromosome counts, and breeding system

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Abstract

Cristaria (Malvaceae) contains about 20 species distributed in Chile, Argentina, and Peru. Most of the species are confined to the Chilean Atacama desert, two species are shared with Argentina, and three species had been reported for Peru. Of the three species previously cited for Peru, only *Cristaria multifida* is recognized here. One new subspecies is described (*Cristaria multifida* subsp. *moquipana*) and a lectotype for *Sida pterosperma* is here designated. Nomenclatorial and taxonomic notes as well as a key to the two subspecies of *Cristaria multifida* are presented. Additionally, chromosome numbers for *Cristaria multifida* ($2n = 12$) are reported for the first time. Based on pollen-ovule ratios, *C. multifida* is considered facultatively autogamous to facultatively xenogamous.

Introduction

Cristaria is a genus of about 20 annual or perennial herbaceous to suffruticose species distributed in Chile, Peru, and Argentina, with the majority of the species occurring in the first (Muñoz-Schick 1995). Most species are confined to the deserts of Peru and Chile, that is, the narrow coastal desert of Peru and the Atacama desert of Chile. Two species cross the main cordillera and are also found on the Argentinian side of the Andes, and few species enter the more mediterranean vegetation of northern-central Chile (Muñoz-Schick 1995). *Cristaria* extends over an altitudinal range from sea level to about 4300 m, but only *C. dissecta* (Hooker & Arnott 1833: 153) covers the entire range. The bulk of the species is restricted to the Chilean lomas formations, a fog-dependent vegetation type along the coastal cordillera that has a high level of endemism (Dillon 1997; Dillon & Hoffmann 1997; Rundel *et al.* 1991). *Cristaria* is ecologically similar to the mallow genus *Palaua* which grows sympatrically in the majority of the lomas localities (Huertas *et al.* 2007; Huertas 2010), but the two genera are not closely related (Tate *et al.* 2005).

Cristaria is a member of the Malveae and is circumscribed by the unique combination of the following characters: flowers lacking an epicalyx, carpocrater present, the fruits schizocarpic, the mericarps one-seeded, the lateral walls evanescent, endoglossum wanting, the seeds winged, pruinose. Most characteristic is the carpocrater, a basal plate-like expansion of the columella (Hochreutiner 1920: 348). The carpocrater is shared only with its putative sister genus *Lecanophora* Spegazzini (1926: 211), from which it differs in the evanescent lateral mericarp walls.

Cristaria is a taxonomically difficult genus as already pointed out by Philippi (1893: 24) who described a total of 37 *Cristaria* species, but admitted to being unable to produce a determination key because of the lack of sufficiently consistent characters. Hybridization might be an important reason for the poorly defined boundaries of many *Cristaria* species (see Muñoz-Schick 1995) and is a process supposed to be facilitated by the strong climatic fluctuations in the coastal deserts which cause cycles of habitat contraction and expansion and thereby recurrent contact of temporarily isolated taxa (Schneider *et al.* 2011). Additionally, the presumed restricted gene flow between the many isolated desert populations and the strong responses to the changes in