



## The Family Cladoniaceae (Lecanorales) in the Galapagos Islands

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### Abstract

As part of an ongoing comprehensive inventory of the Galapagos lichen flora, all species in the Cladoniaceae from the archipelago have been revised using both historic and recent collections. A total of twenty-six species is reported here, one species of *Cladia* and twenty-five *Cladonia* species. One species, *Cladonia bungartzii*, is described as new to science; seven are records new to Ecuador and the Galapagos: *Cladonia corymbosula*, *C. polyscypha*, *C. pulverulenta*, *C. pyxidata*, *C. aff. sphacelata*, and *C. strepsilis*. Four species have previously been reported from Ecuador, but are new to Galapagos: *C. cartilaginea*, *C. chlorophaea*, *C. dactylota*, and *C. grayi*. Eight species previously reported cannot be confirmed here. Detailed descriptions are presented for all species. They include diagnostic characteristics to distinguish similar species. An identification key to all Galapagos Cladoniaceae is provided. A brief discussion highlights the importance of baseline inventories and uses the Galapagos Cladoniaceae as a case study to discuss important aspects of lichen biogeography in Galapagos.

**Key words:** Census of Galapagos Biodiversity, Galapagos Lichen Inventory, taxonomy, *Cladonia*, *Cladia*, identification key, Ecuador, South America, *Cladonia bungartzii* sp. nov.

### Introduction

The Cladoniaceae are a large family of about 500 species of lichen forming fungi world-wide. Most are relatively large and conspicuous lichens, some even dominate vegetation communities such as the extensive mats of reindeer lichens in the arctic tundras. In the tropics they can also become quite abundant, several species are conspicuous elements for example of the Andean páramo (Ahti 2000).

In Galapagos, most species of the Cladoniaceae are generally more common if not restricted to the humid highlands; here *Cladonia* mats develop on relatively young lava flows with little soil development, but exposed to high humidity, the typical mist of the garúa season. Many species also grow on old logs, rotting wood, often at the basis of trees and as epiphytes also among the dense mats of liverworts and bryophytes. Relatively few species are found in the transition zone or even the dry Galapagos lowlands.

Galapagos lichens are today relatively well known. The first inventories were summarized in the 1960's (Weber 1966, Weber & Gradstein 1984, Weber *et al.* 1977), culminating in a preliminary list of 196 species; followed by a few updates (Elix & McCarthy 1998, Weber 1993). In 2006 the Charles Darwin foundation started the first comprehensive inventory of non-vascular plants and plant-like organisms and during consecutive visits to now 14 different islands almost 14,000 lichen specimens have been collected, all deposited in the herbarium of the Charles Darwin Research Station (CDS). Since 2005 several publications have appeared, treating many larger species groups as well as some otherwise interesting and spectacular reports and many new species were described (Aptroot & Bungartz 2007, Aptroot & Sparrius 2009, Aptroot *et al.* 2008, Bungartz 2008, Bungartz *et al.* 2008, 2010, Tehler *et al.* 2009).