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## PHENOTYPIC VARIATION IN *CALANDRINIA GALAPAGOSA* (PORTULACACEAE)

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### ABSTRACT

*Calandrinia galapagosa* St. John is found only on San Cristóbal Island in the Galápagos archipelago, where it is severely threatened by feral goats. A population at Cerro Colorado is protected by an enclosure constructed for this purpose in 1993. Individuals of this population have white or pinkish white flowers with a green stem, whereas the population at La Galapaguera, has pinkish white flowers with a purple stem.

### INTRODUCTION

There are 60 species of the genus *Calandrinia* (family Portulacaceae) in Australia and 40 species in the Americas. Some are cultivated as ornamental plants because of their fleshy leaves and attractive flowers. Polymorphic species are found in the subgenera *Baitaria*, *Cistanthe*, and *Rumicastrum* (Mabberley 1997). In Galápagos, Stewart (1911) reported a *Calandrinia* for the first time from Sappho Cove, on the central north coast of San Cristóbal Island.

Later, St. John (1937) noted differences between Stewart's collection and other species of *Calandrinia*, specifically *C. splendens* from Chile. He established that the sepals, the number of stamens, and the seeds were different, and he described it as a new species, *C. galapagosa*, endemic to Galápagos. Later, Eliasson (1968) reported 20 bushes, which were non-reproductive and severely grazed by feral goats, surviving only on inaccessible cliffs. In 1977, H. Adsersen (pers. comm.) found some plants on

lava at Bahía Rosa Blanca (non-reproductive specimens, Charles Darwin Research Station Herbarium).

In 1993, Jacinto Gordillo (pers. comm.) reported a population on Cerro Colorado at an altitude of 150 m on a red clay soil. Ortiz (1994) noted the danger of extinction of this species, mainly due to pressure by feral goats. This site was therefore protected by a 300 m barbed wire fence built in 1993. This fence was never entirely adequate and deteriorated over the years, permitting access by goats once more. It was therefore replaced by a chain-link fence built in 1999 by the Charles Darwin Research Station and Galápagos National Park Service. This enclosure protects not only the largest *Calandrinia* population, but also a large population of the threatened San Cristóbal endemic *Lecocarpus darwinii*.

Arsiniegas (1996) reported a new *Calandrinia* population in four small cones to the southwest of the cone "Media Luna" and in two larger cones located southeast of the cones "Calzoncillo" and "Pan de Azúcar" in the eastern part of the island in the section called La Galapaguera. These individuals are protected from the donkeys and feral goats that exist in the area due to their location on the vertical walls of the cones. In 1999, Alan Tye and Patricia Jaramillo (pers. obs.) found three individuals of this species at a new location at Bahía Rosa Blanca.

In this study I report differences in the color of the leaves and flowers between individuals found at Cerro Colorado and La Galapaguera.

## MORPHOLOGY

Most observers have reported pink-white flowers and green leaves (Stewart 1911, St. John 1937, Eliasson 1968, Wiggins & Porter 1971). More recently, variably colored leaves (Arsiniegas 1996) or slightly purple leaves, or white flowers (Jaramillo 1998) have also been noted.

At Cerro Colorado, Jaramillo (1998) found plants with white flowers that were otherwise identical to the pink flowered plants at the same site, thus confirming that variation exists at this site. J. Sotomayor collected some seeds of this species from Cerro Colorado and M. Arsiniegas from La Galapaguera. Sotomayor germinated them at the Charles Darwin Research Station facility in San Cristóbal. The seeds were germinated with the same substrate at an altitude of 20 m above sea level. The color of the flowers and leaves was different in the two cases: flowers from La Galapaguera were purple and leaves were slightly purplish, whereas flowers from Cerro Colorado were white and the leaves were green. Presumably samples from plants with pink flowers from this site would have produced pink flowers.

Different populations of *Calandrinia galapagosa* thus seem to differ phenotypically, and there is also variation within the Cerro Colorado population. More studies are necessary in order to explain the taxonomic and genetic status of the different forms.

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*Calandrinia galapagosa* San Cristóbal Island.