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Juania australis Revisited in the Juan Fernández Islands, Chile

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The Juan Fernández (or Robinson Crusoe) Islands lie in the Pacific Ocean 400 miles west of continental Chile at latitude 33° S. These islands are botanically of great interest because over 68% of the native species of flowering plants and 19% of the genera are endemic (Skottsberg 1922). Even one endemic family, the Lactoridaceae, survives. Among the endemic taxa, one monotypic genus stands out for its striking appearance: *Juania* Drude of the Palmae (Ceroxyloid major group). The systematic affinities of this unusual genus comprising a single species, *Juania australis* (Martius) Drude ex J. D. Hooker (Fig. 1), have been obscure. It has also been exploited commercially for its attractive stems with black vascular traces.

The late Harold E. Moore, Jr. of Cornell University, well-known to readers of this journal, was a member of the 1965 Chile–United States Botanical Expedition to the Juan Fernández Islands. This expedition consisted of 12 scientists and resulted in many useful collections (Meyer 1966). Dr. Moore was particularly interested in *Juania australis*, and he paid special attention to its collection and preservation, including FAA liquid-preserved material for anatomical study. These materials were examined carefully and the results were published by Moore (1969), Tomlinson (1969), and Uhl (1969).

Our recent expeditions during January–March and November–December of 1980 were also joint Chile–United States cooperative investigations, this time between the Departments of Botany of the Universidad de Concepción and The Ohio State University. The objectives were: (1) to obtain new collections for the herbaria of the Universidad de Concepción and The Ohio State University for continued studies on the flora of Chile; (2) to determine the patterns of evolution of the tree-Compositae and other genera in different families which have speciated most extensively on the islands (e.g., *Blechnum*, *Gunnera*, *Peperomia*, *Wahlenbergia*, etc.); (3) to examine the phytochemical resources of the entire flora with special emphasis on the evolution of chemical systems in the tree-Compositae; and (4) to re-evaluate the phytogeography of the entire flora (earlier presented by Skottsberg 1956).

Although our main focus in these recent expeditions was not primarily on *Juania* (Moore and associates having already completed detailed investigations), we did make two collections (*Ugarte & Parra 9173*; *Stuessy & Sanders 5098*) of juvenile individuals and numerous observations on the largest island, Masatierra. We photographed the species in its native habitat and witnessed the attempts of CONAF (Corporación Nacional Forestal, the Chilean equivalent of our Department of Interior) to preserve this rare palm. The purposes of this paper, therefore, are: (1) to comment on the present status of the species on Masatierra; and (2) to indicate

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1. *Juania australis.*

2. *Juania australis* growing in Corrales de Molina, Masatierra.

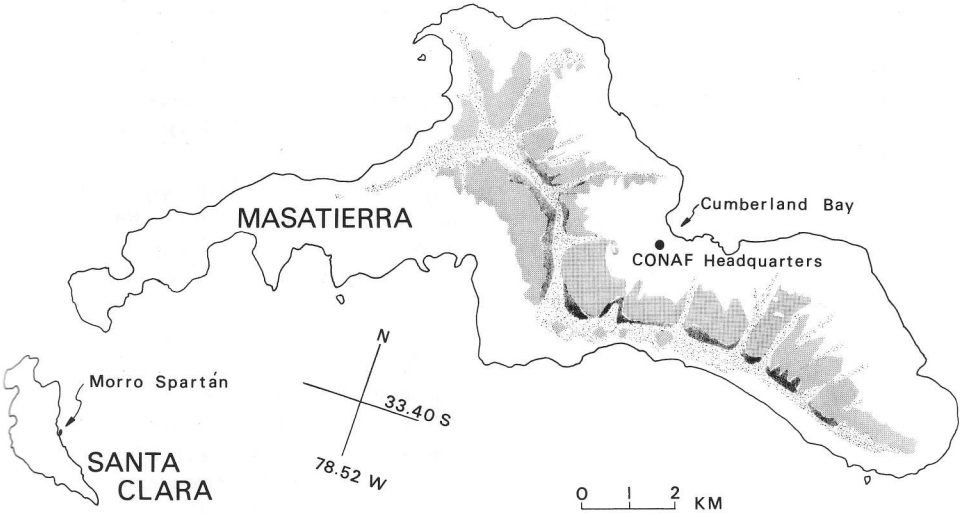
what steps have been taken by CONAF for its continued preservation.

Present Status

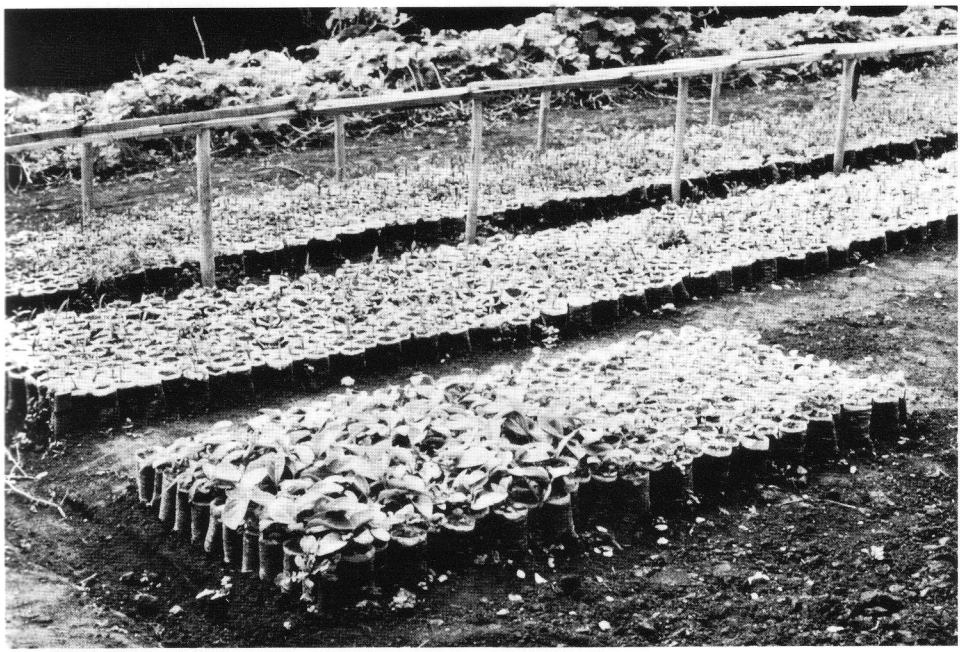
Moore (1977) estimated that about 1,000 individuals of *Juania australis* remained on Masatierra in 1965. At that time the prognosis was not good because the stems were being sought for the manufacture of decorative items because of the attractive dark vascular strands. This destruction has now been stopped because of the conscientious and laudable efforts of CONAF (see plan for development of the islands; Anonymous 1976). Our observations show individuals occurring principally in the upper montane hardwood and tree-fern forests at higher elevations on Masatierra (Figs. 2,3). It is still commonly encountered, but it is never abundant—"scattered" would be a better description. All ages of the species are present, which gives evidence of natural regeneration and augers well for survival. According to Bernardo Ackermann (pers. comm.), the Chief of the Juan Fernández National Park, about 1,000 individuals remain, the same figure as quoted by Moore (1977). There appears to be no immediate danger, therefore, of the species becoming extinct. There is, however, a general pressure from domesticated animals on the native forest, which now covers only the upper one-third of the island (Fig. 3). Hundreds of cattle, horses, sheep, rabbits, and coatis create unnatural disturbances which reduce the native vegetation (Sanders, Stuessy, and Marticorena 1982).

Steps Toward Preservation

In addition to prohibition of cutting stems of *Juania* for the handicraft industry, CONAF has begun a program of artificial cultivation. At the CONAF headquarters in San Juan Bautista on the southwest side of Cumberland Bay (Fig. 3) is a field plot in which seedlings of *Juania australis* are being grown successfully (Fig. 4). Local employees of CONAF, who know well the trails and terrain, collect kilogram quantities of ripe



3. Map of Masatierra, showing generalized vegetation zones and points of interest cited in text. Unshaded, native grassland, introduced weeds, maqui thickets, and eroded areas; light gray, lower montane hardwood forest; black, upper montane hardwood and tree-fern forests; stippled, scrub and exposed ridges.



4. Field plot of seedlings of *Juania australis* (background) growing at the CONAF headquarters, San Juan Bautista, Masatierra. Seedlings of *Dendroseris litoralis* are in foreground.

seeds and return these to the headquarters. Here they are germinated in sand in a plastic-covered greenhouse and the young seedlings are set out in the open in pots. Despite the success of seed collection, germination, and seedling establishment, poor achievement exists in attempting to maintain the young plants in good condition. Almost all of the seedlings die in the field plot, in transfer to another location on the CONAF property, or in replantings in the forest. Some problems relate to insect and herbivore predation and others to water stress. What is needed is a professional propagator familiar with the cultivation of palms to help these excellent efforts of CONAF to become even more successful.

CONAF efforts *have* succeeded completely with cultivation of *Dendroseris litoralis* Bert. ex Dcne. of the Compositae. Hundreds of seedlings are growing well (Fig. 4) and these do establish themselves without problems on the CONAF property and elsewhere in San Juan Bautista. The species also has been cultivated successfully on the Chilean mainland near Viña del mar (*Stuessy s.n.*; OS). This is extremely fortunate because our observations showed only two individuals left in the wild, and both are juvenile plants on Morro Spartán, a small isolated rock near Santa Clara Island (Fig. 3). The survival and reproduction of these two remaining plants is highly unlikely.

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