FLORISTIC KNOWLEDGE AND NEEDS IN PACIFIC TROPICAL AMERICA

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Gentry, Alwyn H. (Missouri Botanical Garden, 2345 Tower Grove Avenue, St. Louis, MO 63110). Floristic knowledge and needs in Pacific tropical America. Brittonia 30: 134-153. 1978.—The tropical American region of the Pacific Basin is undoubtedly the Basin's most poorly known region floristically. It is probably also the richest in number of species. I present here a brief history of floristic work in the area, a review of the region's ecological geography and a summation of the interaction of history and ecology which has led to the present day situation. The current status of floristics in the region is assessed from this perspective and some proposed directions of future floristic research are suggested.

INTRODUCTION

The tropical American region of the Pacific Basin is here defined to include all of the Central American countries (including the Caribbean slopes)—Guatemala, Belize, El Salvador, Honduras, Nicaragua, Costa Rica and Panama—plus the Chocó region of Colombia—Chocó Department and the western parts of Valle, Cauca, and Nariño Departments—and the Pacific lowlands of Ecuador and the adjacent Tumbes region of Peru [Southern Mexico is floristically similar but was treated with North America at the original symposium]. Floristically this is the most poorly known region of the Pacific Basin. The tropical American region is perhaps also the richest area of the Pacific Basin floristically but such large parts of it are still so botanically unexplored that a meaningful estimate of its floristic diversity (surely in excess of 30,000 species of vascular plants) is not yet possible.

The most comprehensive effort to summarize the plants of this region to date has been Hemsley's monumental botanical treatment in Godman and Salvin's Biologia Centralli-Americana (1879-88). Subsequent to Hemsley, one man—Paul Standley—was responsible for most of the floristic work in this region. Almost single-handedly he compiled a series of species lists and florulas for most of the Central American republics during the late 1920's and 1930's (Standley, 1928, 1930, 1931a, 1933, 1937; Standley & Calderón, 1926 [1925]; Standley & Record, 1936). Most of these Floras lacked keys and full species descriptions but to some extent order was brought to the chaos of Central American nomenclature and taxonomy. The culmination of Standley's floristic endeavors was the comprehensive Flora of Guatemala begun in 1946 and now nearing completion under the supervision of Dr. Louis Williams, Standley's successor as dean of Central American botanists [as of 1977 the Flora of Guatemala has been completed except for the majority of the ferns]. At the other end of Central America, Robert Woodson and his colleagues from the Missouri Botanical Garden initiated a comprehensive Flora of Panama in 1943 (in Annals of the Missouri Botanical Garden) which is also nearing completion (projected to be finished in 1978), currently under the supervision of William D'Arcy.

Presented at a Symposium on Floristic Needs in the Pacific Basin at the 13th Pacific Science Congress, Vancouver, 1975. Scheduled publication of the Symposium contributions in Allertonia has been delayed so this paper is being published separately. The manuscript has been rather widely distributed and cited and its conclusions were directly relevant to initiation of new collecting programs in Nicaragua and the Colombian Chocó. For this reason the 1975 vintage assessments of collecting activity are retained even though the botanical data base in these two regions currently is improving rapidly.


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A third comprehensive Flora—the Flora of Peru—had already been initiated by J. F. Macbride of the Field Museum in 1936 but is really outside the scope of this paper. The Flora of Peru, now about three-fourths completed, has been dormant for some time but is being reactivated as a joint project of the Field Museum and the Missouri Botanical Garden in collaboration with the Universidad de San Marcos and the Universidad Nacional de Amazonia Peruana with myself as Principal Investigator.

To the two major Floras now terminating were recently added two additional projects—Flora Costaricensis (1971–present, in Fieldiana) with William Burger of Field Museum as Principal Investigator and Flora of Ecuador (1973–present, in Opera Botanica) under the supervision of Benkt Sparre and Gunnar Harling of the Swedish Natural History Museum and the University of Göteborg, respectively. Neither of these Floras will be completed for several decades.

In summary, Pacific tropical America has a series of out-dated regional and country-wide annotated species lists covering about half its area, two comprehensive national Floras nearing completion, and two recently initiated comprehensive national Floras.

To judge from the names in use in the various Floras and checklists, there is not too much overlap of species from country to country. But as Standley (1928) has noted: “In tropical America . . . the flora has been studied from isolated centers with little regard for the species accepted at other centers, but with the assumption that each area is floristically distinct. Correlation through monographic work, covering a group throughout its range, will reduce the species that have been multiplied unnecessarily.” This taxonomic problem is just as real today. In actuality lowland tropical Pacific America is much more homogeneous than previously supposed, with plant distribution patterns closely correlated with ecology. We must review the ecology of the region to understand its floristic situation.

By far the best system of ecologic subdivision from the phytogeographic point of view is the Holdridge Life Zone System (Holdridge et al., 1971). Vegetation maps using this system are available for all the countries of Central America and northwest South America (see Maps Cited). A composite map of the region has been constructed from these (Fig. 1). In this map only the lowland tropical and subtropical life zones are designated (roughly below 1500 m altitude). For further simplification premontane wet forest and tropical wet forest are united as are premontane moist forest with tropical moist forest, premontane dry forest with tropical dry forest, etc. In addition, all the lowland desert and subdesert life zones are lumped together. As thus modified, this map shows clearly that a continuous band of dry forest extends along the Pacific side of Central America south to northwest Costa Rica and interruptedly across Panama to connect with a similar area of dry forest in northern South America. An isolated area of dry forest occurs in the southern part of Pacific Ecuador and extreme northwestern Peru. Some major river valleys also have dry forest. Similarly wet forest extends the length of the Chocó south along the base of the Andes in Ecuador and northwest along the Caribbean side of Central America to Guatemala. Like the dry forest, this wet forest is interrupted at intervals along its length: the Canal Zone in Panama and sporadically throughout Nicaragua and Honduras. Isolated patches of wet forest also occur along the Pacific side of Central America, notably in the Azuero Peninsula of Panama and the Osa Peninsula region of Costa Rica. The wet forest tends to be displaced inland onto the lower slopes of the mountains north and south of the Chocó. It is replaced nearer the coast by an ecologically intermediate but floristically distinct moist forest vegetation similar to the vegetation covering much of the relatively low interiors of Honduras, Nicaragua, Costa Rica (Meseta Central) and Panama. In northwestern Ecuador the Chocó wet forest is similarly replaced by moist forest. A final lowland life zone—the pluvial or true rain forest is restricted to the central Chocó Department and narrow