EDITORIAL INTRODUCTION

Exploring the Ways of the Plant

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Five of the six floristic kingdoms on Earth contribute to the formation of the terrestrial flora and vegetation of the continents surrounding the Pacific Ocean and its islands – 'Pacifica'. Within the region, extremes of climate and an extraordinarily complex geological history have led to one of the most diverse assemblages of living organisms on the planet. There are good biogeographical reasons why the unique taxonomic history and ecological complexity of the Pacific flora continue to attract the attention of life scientists worldwide: Pacifica includes the world's longest continuous latitudinal gradient (> 60° N to > 55° S) of vegetation, stretching from the Arctic to the southern tip of the tropical Malaysian peninsula in Asia, to southernmost South America and the sub-antarctic islands. The longitudinal gradient reflects continentality on both sides of the Pacific, with vegetation that includes the Arctic, the humid subtropical and warm-temperate evergreen forests of southeastern China and Japan, the complex tropical forests of eastern Indomalesia, the Australian and Chilean sclerophyll forests, the Andean deserts of South America, the temperate rainforests of northwestern North America, and the cold steppes in western North America**.** Many of the so-called "Living fossils" that reflect the evolutionary history of the Earth's biota are found in Pacifica.

The flora of Pacifica has not only served as an inter-generational focus for scientific study but continues to inspire original concepts and principles that, through researchers such as Darwin and Takhtajan, create such a resounding impact on science. Over the centuries, researchers have been captured by the unique diversity of Pacifica and the intricate web of evolutionary relationships between humankind and plants. Apart from natural evolutionary processes, human culture is one of the most significant determinants of modern vegetation that, when combined with natural processes in Pacifica, is unique within a global context.

Inspired by the flora and vegetation of Pacifica, we consider it our duty to draw the attention of researchers worldwide to these important relationships. The focus of the new journal *Botanica Pacifica* is plants and related groups of organisms at different organizational levels, from molecular to the biosphere, and at different temporal and spatial scales. We expect the primary stage of journal development to focus mainly on the basic problems of modern biology, such as novel concepts, and theories related to a living plant and fossils, including the ever present 'hot' topics related to the accumulation of information about plants and their management.

Among the most urgent needs is the standardization of taxonomic nomenclature. This problem cannot be solved within existing national taxonomies and is achievable only through close international cooperation. A resolution to this problem will greatly facilitate the comparison of floristic and vegetation databases from different countries that has not been realized so far due to lack of uniformity in data collection, storage and analysis. A unified approach will improve understanding of the evolution of the flora and vegetation complexes in Pacifica by identifying plant response to biophysical gradients in a hierarchical system of chorological units.

At a time when precise spatial and temporal monitoring of vegetation cover is so readily available, it is sometimes problematic for the general public and funding agencies to be convinced that there are still real gaps in our knowledge of plant biodiversity over very extensive and sometimes not so remote geographical areas. Obtaining valid data over a broad spectrum of traditional botanical tasks is a major challenge for most botanists and ecologists. As a result, publishing new data will be one of the major goals for our new journal. New species taxonomic and plant functional diagnoses, species assemblages, vegetation classification, new technologies of biodiversity assessment and vegetation mapping will always be welcome in *Botanica Pacifica*.

Understanding the influence of climate on plants and vegetation is one of the fundamental problems facing life scientists due in no small way to our limited

understanding of the ecology and evolution of the biota. In recent decades, the scientific community has proposed a number of scenarios for the post-Pleistocene development of the biota and has attempted to model changes in the biota based on recorded and projected climate trends. The limited selection of plant attributes in modeling and the simplistic view of plant responses to varying climate, have led to significant errors in these scenarios, leading to inaccurate predictive modeling of the interaction of climate and the biota. Modern biogeographical studies show that a significant proportion of the biodiversity at the regional level is concentrated not in zonal habitats often over large areas, but rather in very localized azonal, intra-zonal and extra-zonal areas representing abnormal geomorphological, edaphic, or topographic situations that may include calcic or ultrabasic outcrops, aeolian sand, wetlands, or coastal dunes. The biota of such sites tends to differ significantly from the general regional biota and is often characterized by a high degree of endemism.

Studies in such areas, including reconstructions of vegetation history in climatically contrasting periods, have already contributed significantly to understanding the patterns and processes of the formation of regional floras. Relictual and endemic species deserve much more attention beyond species lists, and often highly speculative interpretation of their ecological and floristic relationships. So far we have very little historical information about the complex adaptations of relictual plant species where such information may be very important for understanding and forecasting the responses of plants to global change. There are still major deficiencies in our capacity to model the optimal conditions for the development and establishment of relict species and their genetically related relatives, to reconstruct their paleodistributions, and to understand how their main migration routes are linked to the chronological scale.

Another area that we hope will be reflected in the journal is improved research on cryptogamic plants and related organisms (lichens, fungi, slime molds, cyanobacteria). In the same way that we identify knowledge gaps in the vascular flora, so should we also identify focal areas for research on non-vascular plants. Study of cryptogamic organisms is unfortunately lacking on all the continents fringing the Pacific. Maintaining the existing *status quo* will detract from proper taxonomic decisions for the most problematic groups of cryptogamic organisms. Recent studies show clearly that current knowledge about the evolution and systematics of cryptogamic taxa, including those in East Asia, is largely inconsistent with previous, widely accepted hypotheses. It is important to study patterns of dissemination and distribution of cryptogamic organisms, as they possess unique dispersal and establishment characteristics that permit their survival under extreme climatic and edaphic conditions. Such information is vital if we are to improve reconstructions of the genesis of floras, phytogeographical classifications and our capacity to forecast the effects of climate change on the Earth's vegetation cover.

In summary, a major purpose of *Botanica Pacifica* is the removal of artificial, man-made boundaries, wherever these exist in the plant world. We encourage potential authors to use the journal to communicate all botanical information to our colleagues worldwide. We hope this journal will stimulate wide-ranging discussion, and invite researchers to participate in this brainstorming session in order to better understand the way of the plant, which in ancient philosophy was marked by sign 道.