

Staghorn Ferns Today and Tomorrow

by

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The unique appearance of staghorn ferns (*Platycerium*) has attracted the attention of enthusiasts for well over a hundred years. Modern transportation and communication have brought all 18 species into cultivation. So great is interest in this fascinating fern group that it seems appropriate to note recent horticultural and botanical works that have solved many puzzles and to look ahead to problems yet to be answered.

HORTICULTURAL CONTRIBUTIONS. Horticultural interest in staghorn ferns has greatly benefited botanical work. The perseverance and tenacity of *Platycerium* fanciers who seek out new plants, grow them, and develop new varieties is amazing. Through their efforts I have been able to study every one of the known *Platycerium* species as live plants. The opportunity to watch plants grow from spore to maturity contributed greatly to the botanical knowledge of the genus.

Platycerium enthusiasts in United States cultivated a new species from Malaysia for several years before it was recognized and named by botanists (Joncheere and Hennipman 1970). This handsome plant, now called *Platycerium holttumii*, was well known enough by amateurs to have been photographed for two popular books prior to being formally named (Rüe et al 1957, Franks 1969). A second new species, the *P. grande* of the Philippines, has been recognized in the last few years (Joncheere and Hennipman 1970), another exciting event to platycerium fanciers! These relatively recent discoveries kindle the imagination of collectors who hope that different species may still be discovered. Collectors continue their quest for new and unusual platyceriums. Shipments of *P. wallichii* have reappeared in the United States, and these plants do show some frond variation. The significance of these variations has yet to be investigated. These plants were reported to have been collected along the India-Burma border. Native plants of *P. stemaria* have an interesting range of frond variation which may interest botanist as well (Joe 1964). But besides seeking variations among wild plants, horticulturist are developing new garden varieties. The multitude of new garden varieties is due to the increased number of people raising plants from spores. A hybrid platycerium, *P. mentelosii* (*P. stemaria* x *superbum*) has been developed and other hybrid combinations will most likely follow (Hoshizaki 1975). Growers tell us that platyceriums are quite plastic in their leaf form. Slight changes in the environment may cause base fronds to become partly foliaceous, normally entire fronds to become forked and so forth.

Staghorn fern propagation by meristem or tissue culture is being actively investigated by commercial nurseries. They claim that plants may grow twice as fast through meristem culture as by spores. Meristem plants tend to produce mutations more frequently than spore grown ones and this interest horticulturist and geneticist.

The Malaysian plant, *Platycerium ridleyi*, thought extinct, has been found and introduced into United States cultivation. It grows very nicely in southern California

greenhouses if adequately protected from slugs and snails. Spores from these introduced plants have produced mature plants, thus insuring the species' survival and reducing the need to collect these rare plants from native habitats, a happy circumstance for conservationists.

Much more information is needed on the cultural conditions for *Platycerium wallichii* of Southeast Asia, and *P. madagascariense* and *P. quadridichotomum* both of Malagasy. These species, being difficult to cultivate, create demands for replacement, a situation which is not encouraging for conservationists. Hopefully more work along the lines of Boyer will help in the successful growth and propagation of these plants. Boyer closely examined the ecology, physiology, and mineral needs of two African species, *P. angolense* and *P. stemaria* (Boyer 1964).

The type of foregoing activities and results generated by horticulturists hold promise of supporting and even giving direction to scientific work and increasing our understanding of the genus. To help science, horticulturist should be encouraged to maintain reliable records as to where native plants were collected, or if new plants were developed in cultivation, the names of the parent or parents involved. Conditions which may have caused unusual growth patterns should also be recorded. Horticulturists on the other hand should protect native plants and prevent their extinction from indiscriminate collecting.

BOTANICAL CONTRIBUTIONS. The name changes among platycerium species confuse and frustrate growers and most botanists. If it is any comfort to know, botanist specializing in nomenclature have for years been trying to unravel the technical complexities in determining the proper name for certain species. A series of papers and rebuttals dealing with this problem has been published in the last few years by G. J. Joncheere and the late C. V. Morton (Morton 1964, 1970, Joncheere 1967, 1974). The main issues first center around whether *Platycerium vassei* as conceived by botanist, not horticulturist should be called *P. alcicorne* and second, whether *P. angolense* should be called *P. elephantosis*. A few botanist are following this intricate and complicated problem and their views will be forthcoming. Morton's argument, that the correct spelling of *P. stemaria* is not *P. stemmaria*, seems to be upheld. The acceptance of *P. wandae* as the legitimate name over *P. wilhelminae-reginae* seems without complication (Joncheere 1968). However, among plants introduced from New Guinea and now growing at Longwood Garden, Pennsylvania are two kinds of *P. wandae*. One produces long fertile fronds fitting the original description of *P. wilhelminae-reginae* and the other produces short fronds closely fitting the description of *P. wandae*. In all likelihood both plants are one species. Short and long fertile frond forms have also been noted in *P. coronarium*. However, further study and field observations on long and short frond plants might be of interest.

It is indeed unfortunate that the name *Platycerium grande* must now be applied to the Philippine plant instead of the Australian plant. The Australian plant must now be called *P. superbum* in accord with Joncheere and Hennipman (1970). I examined the rhizome scales of the Philippine plant and they differ from the Australian plant, though both are closely related. Rhizome scales of the Philippine plant are very similar to *P. holttumii* except for having slightly fewer cells in the marginal hairs (highest number of cells in the longest hairs were mostly 7 in *P. grande* and 8 in *P. holttumii*). The scale morphology is consistent with other morphological data which relates *P. grande*, *P. superbum*, and *P. holttumii* (Hoshizaki 1970, 1972).

The relationships of the Australian-Javan species (*Platycerium bifurcatum*, *P. veitchii*, *P. willinckii*, and *P. hillii*) and their distribution still needs to be clarified with more data. Some of the features separating these supposedly different species are not stable from observations on plants in cultivation. Mr. Ernest Todd of New South Wales, Australia has been investigating the distribution of the Australian-Javan species. In a personal communication Mr. Todd reports that the collections of

P. bifurcatum by Bamblér and others in New Guinea were probably taken from cultivated or escaped plants most likely introduced by German missionaries in the early part of the century. Distributions of some of the Malayan-Asiatic species also need further clarification.

Platycerium coronarium and *P. ridleyi* are very closely related species, yet there is a gap between these two species and their closest relatives. It doesn't seem too far-fetched to speculate that some yet undiscovered species may be found in the Malaysian area that bridges this gap and others as well.

With the relatively wide-spread use of the scanning microscope studies should be encouraged on the ontogeny of stellate hairs in this genus and its proposed relatives (*Pyrrosia* and *Drymoglossum*). It might be worthwhile to also study and compare these genera as to sporangial structure. Within the platyceriums are species with complete to incomplete annular rings, laterally and apically located lip cells, and stalk structure variations.

Certainly there are many topics I have not touched upon that should be considered in future studies. However, I want to stress that botanist and horticulturist have much to look forward to in knowing more about these unusual plants.

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