Botrychium Jenmani in Cuba

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The genus *Botrychium* is very widespread in the tropics as well as in temperate regions, but, to judge from herbarium collections, in the tropics, the species are uncommon. *B. Jenmani* Und., as originally described and as treated in the North American Flora (Vol. **16**: part 1), was based entirely on Jamaican material. Now, however, Cuba may be added to its range by reason of a recent collection made by Dr. J. A. Shafer, in February of this year, between La Perla and Santa Ana, in the province of Oriente. (*Shafer no. 8626*, Feb. 11, 1911.)

The plants collected were just in a mature fruiting condition, some of the sporangia having opened, the others still closed but full-sized. In Jamaica the fruiting period appears to range from late December to April, just about six months earlier than the fruiting season of *B. Underwoodianum* Maxon, the related Jamaican form. These two species form one of the several interesting pairs of *Botrychium* species, which occur in widely separated regions, and include in each locality two forms more or less alike in form and cutting but differing in the time of fruiting.

In Jamaica the pair comprises, as just noted, *Botrychium Jenmani* and *B. Underwoodianum*. In the southern United States a similar pair exists in the case of *B. biternatum* (Lam.) Und., and *B. alabamense* Maxon, fruiting in the early spring (February to April) and in the early fall (September), respectively. In California, *B. silaifolium* Presl and *B. californicum* Und. appear to constitute a similar pair, with *B. californicum* the earlier species. Now recently it has been suggested by a writer in the Fern Bulletin that there is here in the Eastern States a similar difference between *B. silaifolium intermedium* and *B.*

obliquum, the latter being said to be at least a month later in the same locality.

The explanation of the relationships of the extremely puzzling forms in the *Botrychium ternatum* group, here recognized as species, is not a simple one from our present knowledge of these plants. It is comparatively easy to arrange most of them in an evolutionary scheme, recognizing geographic distribution and consequent climatic difference as two chief causes of variation. This explanation, however, clears up only a part of the difficulty, and what remains is the more perplexing. More facts are needed regarding the habits, fruiting periods, and form variations. From the present knowledge, it appears to the writer that most of the distinct forms are deserving of the rank of species. It may be that new evidence, especially if discovered by experiment, will make a considerable change in our conception of these plants. The most promising field would appear to be along the line of pedigree cultures, but unfortunately it still remains to be discovered how these ferns may be raised from spore to adult condition.

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