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On the Genus *Hobsonia*

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**Dawsonia limbata** Dix.

Eastern Highlands; Goroka Sub-district, near Kerigomna Camp, on steep rock along creek, ca. 3000 ft, *R. D. Hoogland & R. Pullen 5596*. Eastern Highlands; Goroka Sub-district, Asaro Valley, near Miruma, 6800 ft, terrestrial, forest edge, *R. G. Robbins 825*.

**ON THE GENUS HOBSONIA**

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Early in March, 1958, I received from Dr. C. M. Haenseler of the New Jersey Agricultural Experiment Station an ample collection of *Hobsonia* which had been found growing on corn cobs used as a mulch in a greenhouse at Cranbury, New Jersey, on February 25. This collection was of particular interest since it seemed to be almost exactly intermediate between the two recognized species *H. gigaspora* Berk. and *H. mirabilis* (Peck) Linder. It seemed desirable, therefore, to review the two species.

*Hobsonia* Berk., with the type species *H. gigaspora* Berk., was published by Masee (Ann. Bot. 5: 509, f.1. 1891) on the basis of the type specimen from Venezuela and notes found in Berkeley's herbarium after his death. The accompanying figure of the conidium is not very satisfactory but Linder (Ann. Missouri Bot. Gard. 16: 340. 1929) examined the type, a portion of which is in the Farlow Herbarium, and found it to agree with the other specimens at his disposal. The year after Masee's publication Patouillard (Bull. Soc. Mycol. Fr. 18: 185, f. a-e. 1892) described a second species, *H. ackermannii* from Guadeloupe, stating that it differed from *gigaspora* in many ways, especially in the larger receptacles (by which he meant sporodochia) and the form of the spores. The size of the sporodochium is scarcely significant in a fungus such as this, but Patouillard's drawings are much more accurate than the sketch published by Masee and if, as seems to be the case, Patouillard depended upon the description and illustration published by Masee for his concept of Berkeley's species, he was quite justified in publishing a new name for the Guadeloupe collection. However, Linder, after examining both, found them essentially the same, and reduced *H. ackermannii* to synonymy with *H. gigaspora*.

A decade earlier Peck (Ann. Rep. N. Y. State Mus. 34: 46, f. 6-10. 1881) had described *Helicomycetes mirabilis*. Linder examined two specimens, one from New York and one from Tennessee, but apparently did not see the type, to which he refers as "probably in the herbarium of the New York State Museum." He transferred Peck's species to *Hobsonia* but retained it as distinct from *H. gigaspora*. He did not provide a key, but the differences between the two species, as he understood them, may for convenience be put into key form as follows:

Milky white, gelatinous when moist, "Cinnamon Buff" and horny when dry; conidiophores subdichotomously branched, spirally coiled; conidial filament (6-)8-12(-14) $\mu$  thick; spores less turgid and contents less dense.

*H. gigaspora*.

White when moist, not conspicuously gelatinous, "Ochraceous Buff" when dry; conidiophores less branched, not or only slightly spirally coiled;

conidial filament (9-)12-15(-17) $\mu$  thick; spores turgid and with dense contents. *H. mirabilis*.

It will be noted that all these distinctions are relative. Linder evidently thought spore width most significant, for he published a graph showing the overlapping but apparently significant difference in the widths of spores as measured across the septa. The other distinctions are of less importance and might well be characteristic of a single species at different stages of maturity and developing under various environmental conditions.

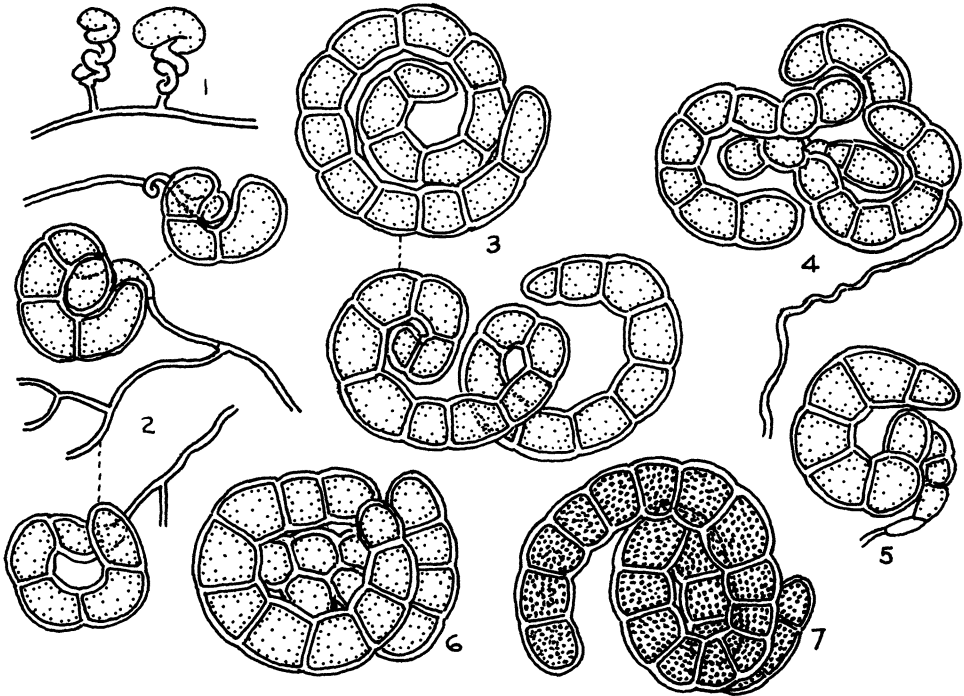
In 1935 I found *H. gigaspora* in abundance in the mountains of western Panama at elevations of 5300-6000 feet and in the Sierra Nevada de Santa Marta of Colombia at elevations of 5000-6000 feet (*Mycologia* **29**: 624. 1937). In both areas, the collections from the higher altitudes were luxuriant and were growing on decaying culms of spiny bamboo, while those from lower elevations were less luxuriant and some were growing on the bark of fallen angiosperm branches. A collection from Hawaii (*Doty 8490*), on banana leaves at 1500 feet, is entirely typical, and I have recently examined several specimens collected by A. L. Weldon in the mountains of Jamaica which are typical of *H. gigaspora* as at present understood.

The spores of the New Jersey collection were within the upper size range of *H. gigaspora*, which is also within the lower size range of *H. mirabilis*, and there was every variation between spiral conidiophores and straight and often dichotomously branched ones. I succeeded in getting the fungus in pure culture with some difficulty, since associated bacteria and molds were extremely persistent. It is noteworthy that the *Hobsonia* fruits more rapidly and abundantly in culture when these organisms are present than when the culture is pure, but in either case the fruiting is entirely typical.

The type specimen of *Helicomyces mirabilis* Peck is, as Linder supposed, in the N. Y. State Museum and through the courtesy of Mr. Stanley J. Hughes I have been permitted to examine it. Dr. I. Mackenzie Lamb kindly sent me all the collections filed under *Hobsonia mirabilis* in the Farlow Herbarium. While I have soaked only small fragments of some of this material, there is every indication that the sporodochia are quite as gelatinous as in the collections referred to *H. gigantea*. There is a slight and inconstant color difference. In general, the specimens assigned to *gigantea* are dingy whitish to pale ochraceous while those assigned to *mirabilis* tend to be ochraceous to orange-brown. There is a very great suggestion that this is largely if not entirely a matter of age, since there is complete transition with overlapping. I have not seen conidiophores in all mounts made but I have seen a sufficient number to suggest that there is no significant difference in this respect. It seems highly probable that many conidiophores that begin as close spirals become stretched and straightened out as gelatinization proceeds in developing sporodochia, and that in the more fully developed sporodochia a substantial number of conidiophores may be straight or nearly so from the beginning. As already noted, the conidiophores of the New Jersey collection range from almost straight to closely coiled. Both species form sporodochia, but most of the specimens of both also showed an accompanying effused, gelatinous growth. This leaves the diameter of the spore filament and the turgid character of its cells as the only remaining difference to be considered. Linder measured the width of the filament at the septum and makes no mention of the rather thick hyaline wall surrounding the cells which is, however, shown in Peck's figures. I have found it more convenient to measure the widest cell in each spore and to include the hyaline wall in the dimension recorded, hence my

measurements are probably slightly larger than his. The widest cell I measured in the type collection of *H. mirabilis* Peck was  $18\ \mu$  in diameter. Those of the Dudley collection from Ithaca, measured from Thaxter's slide and from a single spore mounted from the original material, did not exceed  $14\ \mu$  in diameter; those from Thaxter's Tennessee collection on corn and *Aristolochia* were about the same. These were the specimens cited by Linder. The largest cell of many seen in the New Jersey collection was  $16\ \mu$  in diameter. In all mounts there were many spores with cells of smaller diameter.

With reference to the turgid appearance of the cells, I have found no significant differences. A collection from Brazil sent to me some years ago by Fr. Rick was determined by Linder as *Hobsonia mirabilis*. In this collection the sporodochia are dark orange-brown in color, with very large, turgid conidia attaining a diameter of  $19\ \mu$  and with the cell contents markedly granular. It is typical of



FIGS. 1-7. *Hobsonia mirabilis*. FIGS. 1-3. New Jersey collection. FIG. 1. Two conidial primordia on coiled conidiophores. FIG. 2. Three developing conidia, showing apparent straightening of conidiophores. FIG. 3. Two mature conidia. FIG. 4. Conidium and conidiophore of Thaxter's collection on corn-cob from Tennessee. Linder's figures of *Hobsonia mirabilis* were drawn from this material. The attachment of the conidiophore is near the center, but could not be traced. FIG. 5. Typical but rather small conidium from collection of *Hobsonia gigaspora*, Panama, *GWM 2519*. FIG. 6. Conidium from Peck's type of *Helicomyces mirabilis*. FIG. 7. Conidium from Rick's Brazilian collection, with very turgid cells and dense granular contents.

All figures were drawn with the aid of a camera lucida and reduced in reproduction to approximately  $\times 400$ .

what has been regarded as *mirabile*. On the other hand, the type collection of *Helicomyces mirabilis* is much paler in color, the conidia are not markedly turgid nor are the cell contents noticeably granular. These collections are united by the characters of other collections and both grade into what would generally be regarded as typical *H. gigaspora*.

I conclude, therefore, that the genus *Hobsonia* includes a single species, widely distributed, especially but not exclusively, in the tropics, and that variations in sporodochial formation, color of sporodochia and of the spores, type of conidiophore, diameter of conidium, turgidity of conidial cells, and character of cell contents all represent differences due to age and development and responses to environmental conditions. The correct name for this species is *Hobsonia mirabilis* (Peck) Linder.

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Sect. 1. The name of this Society shall be the American Society of Plant Taxonomists.

### Art. II. Object of the Society

Sect. 1. The object of the Society shall be to promote the interests of taxonomy and systematic botany of vascular and non-vascular plants and the scientific welfare of its members. These interests are held to embrace phylogeny, phytogeography, ecology, floristics, and allied subjects; and the methods of experimental botany, of morphology, and of other disciplines, insofar as they bear upon taxonomy, as well as those of the herbarium.

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