NOTE.

NOTE ON THE FOLIAR ORGANS OF MONOPHYLLAEA.—THE small genus of Cyrtandraceae, *Monophyllaea*, comprises seven species of soft succulent herbs growing on limestone rocks from Southern Siam southwards to the Malay Peninsula, Sumatra, and Borneo. The species are all very similar in appearance and habit.

Monophyllaea Horsfieldi Br. A native of the Malay Peninsula; has been in cultivation in the Botanic Gardens, Singapore. It is a monocarpic plant, with a cylindric succulent stem, slightly dilated at the base, where it emits numerous rootlets. In a large plant the stem is about 6 inches tall, and half an inch through; on the top are borne two foliar organs, of which one is very much the larger, attaining a length of 12 inches and a width of 18 inches. The leaf is ovate-cordate and sessile, with nerves radiating from the base. It is thinly fleshy, and more or less sprinkled with hairs. The opposite leaf is very small. From the axils of these leaves rise four or five slender peduncled scorpioid cymes of small white flowers.

The seeds are borne in a small capsule, and are minute, elliptic, with a reticulated testa.

On germination two small, equal, semicircular, rounded cotyledons appear, rather broader than long. Very soon, however, as the young plant grows, one becomes more oblong, and longer than broad. It is now larger altogether than the other. After a week or two the larger one, increasing in size more rapidly than the other, becomes ovate-cordate with a blunt tip, and the midrib and lowest pair of nerves are faintly visible. The other leaf, though it increases in size, retains its original form, but is now not a quarter of the size of the big leaf. When the latter is half an inch long, it shows its complete nervation, and becomes slightly hairy along the lower edge. The smaller leaf is now concealed under the lobes of the cordate bigger leaf. As the plant grows, no buds appear on the stem below the leaves, and there are no leaf-buds in the axils of the two leaves.

Thus, in *Monophyllaea*, there is no stem except the original hypocotyl, and no leaves other than the two original cotyledonary leaves, of which one practically becomes abortive.

In 1861 Mr. Crocker (*Journal Linn. Soc.*, vol. II, p. 65) showed that the two very unequal leaves of *Streptocarpus polyanthus* were the permanent cotyledons, and that the plant was leafless except for one or two upper leaves, unless the bracts of the inflorescence were considered as such.

Mr. Clarke (*Monogr. Cyrtandr.*, p. 12) suggests that in other one-leaved species of Cyrtandreae of various genera the one large leaf may also be the cotyledon. He instances *Didymocarpus pygmaea*, *Trachystigma Mannii*, *Acanthonema strigosum*,

Epithema Horsfieldi, and all the six species of *Monophyllaea*, and says that 'if it should appear that the solitary leaves of these are really permanent cotyledons, it will be an additional proof of the very close connexion between different genera of the tribe.' Certainly in *Monophyllaea* the only foliar organs are the cotyledons. In adult plants the smaller cotyledon usually disappears, and I cannot see any bracts, even, in any of the specimens. Of the other plants of this habit mentioned by Mr. Clarke, *Trachystigma*, *Platystemma*, and *Acanthonema* have bracts, and of *Didymocarpus pygmaea* Mr. Clarke says, 'Bracts none, or inconspicuous.' *Epithema* has often fully-developed normal leaves, and a large cup-shaped bract at the base of the flowers. A plant of very similar habit to *Monophyllaea* is *Argostemma unifolium* King. This has a succulent stem swollen tuberously at the base, and a large rounded leaf from the axil of which arise one or more peduncles. This Rubiaceous plant grows on rock faces, as *Monophyllaea* does. I have not had any opportunity of raising it from seed, but it is clear, I think, that in this plant the large leaf is not one of the cotyledons, for half-way up the stem, below the large leaf, is a pair of ovate scale-like leaves showing the presence of a node. These may be remains of cotyledons, but it is obvious that the upper leaf is not. Further, the large leaf is really one of a whorl of four leaves of which three are reduced to small size. Some allied species of *Argostemma* have a terminal whorl of four equal leaves, and in *A. unifolium* it appears that one of these leaves has developed to a large size while the others remain undeveloped.

A few other plants which inhabit these wet rock surfaces beneath the gloom of the forest seem also to have a tendency to reduce the number of leaves and increase the size of one, but in all of these it seems that these are true leaves and that it is only among the Gesneraceae that we find the cotyledons persisting and the true leaves not developed.

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