

Intumescences on the Leaves of *Marlea begoniifolia*, Roxb.

LAST summer my attention was drawn to the peculiar appearance presented by the leaves of a plant of *Marlea begoniifolia* growing under glass in the Royal Botanic Garden. On closer examination it was seen that the under surfaces of the leaves were studded with minute outgrowths, the largest barely exceeding 1 mm. in height. They varied in colour from the yellowish-green of the smaller swellings to the dark brown of the larger protuberances. They were absent from the upper surface, and were not observed on the other vegetative organs of the plant.

Microscopic examination of these structures showed that each had its origin immediately below a stoma. Division of the underlying cells of the mesophyll, accompanied by longitudinal division of the epidermal cells around the stoma, resulted in the formation of a hemispherical swelling, composed of thin-walled cells with vacuolated protoplasm and prominent nuclei, and enclosed by the extended epidermis, the stoma now being situated at the apex of the outgrowth, and completely occluded by the underlying compact tissue derived from the repeated division of the mesophyll elements. It is worth noting that although stomata are also present in the upper epidermis of the leaf, yet there was no hypertrophy of the tissues on that surface.

As the outgrowths increase in size they become lobed or branched, while the included elements are much elongated, with sparse protoplasmic contents and large vacuoles. At this stage the encompassing epidermal layer appears to have become disorganised, and the outline of each malformation is extremely irregular. Ultimately the outgrowths wither and die.

Intumescences resembling those found on *Marlea* have been recorded by Tomaschek * as occurring on *Ampelopsis hederacea*, while similar outgrowths in various plants have been described by Frank † and Sorauer.‡ More recently Miss Dale § has investigated very fully the nature and cause of the intumescences on *Hibiscus vitifolius*, and her conclusions as to the conditions favouring the production of the malformations suggest that the abnormal structures on the leaves of *Marlea* owe their origin to similar environmental conditions. A moist atmosphere, provided there is a sufficient temperature, seems to create a pathological condition inducing the formation of these outgrowths in *Marlea* as in *Hibiscus*; but, so far as is known, there has been no previous record of their occurrence in the former genus.

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* A. Tomaschek in Oester. Bot. Zeitschrift, xxix (1879), p. 87.

† A. B. Frank, Krankheiten der Pflanzen, iii (1896), p. 313.

‡ P. Sorauer in Ber. Deut. Bot. Gesell., xvii (1899), p. 456.

§ E. Dale in Proc. Camb. Phil. Soc., x (1899), p. 192, and in Phil. Trans. Roy. Soc., Ser. B, cxciv (1901), p. 163.

[Notes, R.B.G., Edin., No. LX, January 1921.]