A Study of the Vascular System of Matonia pectinata.

BY

A. G. TANSLEY, M.A.,

Assistant-Professor of Botany, University College, London,

AND

MISS R. B. J. LULHAM, B.Sc.

With Plates XXXI, XXXII, and XXXIII, and five Figures in the Text.

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INTRODUCTORY.

EVER since the meeting of the British Association at Bristol in 1898, at which Mr. Seward described[1] the complicated and striking vascular anatomy of the comparatively rare Malayan fern *Matonia pectinata*, the problem of relating this apparently unique vascular skeleton to those of other Ferns has been a matter of considerable interest to students of Filicinean vascular morphology.

[1] Subsequently published in full, Phil. Trans. B., vol. cxci, p. 171, 1899.

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It was already evident in 1898 that a study of the young plants would throw light on this question[1], though the importance of the vascular structure of the first-formed stem, especially in Ferns, as furnishing an ontogenetic parallel to the process of evolution of the adult structure, was not at that time so clearly recognized as it is to-day.

It was largely for this reason that I welcomed the opportunity, in January, 1901, of joining Dr. W. H. Lang in his visit to Mount Ophir in the Malay Peninsula, the original locality[2] for *Matonia pectinata*, which is particularly abundant on its upper slopes. I can confirm Wallace's description of the habitat of this magnificent Fern, as quoted by Seward[3]. The *Matonia* is almost confined to open situations on Ophir, covering the comparatively shallow soil overlying the flat or gently sloping rock faces in dense thickets. Its most abundant congener in these thickets is *Gleichenia linearis* (*dichotoma*), while *Gleichenia flagellaris*, *Dipteris conjugata*, and a little *Pteris aquilina* are also constantly associated. All these Ferns are characteristic of the open, or of slightly shaded situations. *Matonia* scarcely penetrates the thick dwarf woods of the upper part of Ophir, though an occasional clump occurs where an opening in the trees allows more light than usual to reach the ground. In Borneo *M. pectinata* occurs on Santuborg and Matang, 3,500 to 3,800 feet above sea-level, situations which seem quite comparable to the Ophir one, though curiously enough it is said to be there confined to old jungle[4], quite contrary to its occurrence on Ophir. It is also known from various Malay islands at sea-level, and thus seems to belong to the coast-mountain flora to which Ridley has called attention[5].

Young Plants of Matonia pectinata.

After considerable search I discovered three young plants embedded in moss and humus on a shaded ledge of rock, a few feet below the rocky top of Gunong Ledang, which is the principal summit of Mount Ophir. These are represented on Plate XXXI, Figs. 4, 5, 6, and 7. The strong resemblance of their fronds to those of older but starved specimens of the plant growing in a deeply shaded crevice below an overhanging rock on the other side of the summit, left no doubt of the identity of these plants, while their small size and the shortness of their rhizomes indicated their comparative youth.

Dr. Lang afterwards found three even younger specimens, which he very kindly handed over to me, in the damp soil by the side of a small stream on Padang Batu. These are represented on Plate XXXI, Figs. 1, 2, and 3, and here again the form and venation of the fronds, when compared with the

[1] Seward ('99), pp. 180, 181.
[2] Wallace, The Malay Archipelago, 1886, p. 30.
[3] Seward ('99), p. 171.
[4] Seward ('99), p. 174.
[5] Ridley ('01).