A PRELIMINARY NOTE ON TRACE FOSSILS FROM THE BAGH BEDS OF NARBADA VALLEY

PRESENT communication is intended to notify the occurrence of a variety of Trace Fossils (trails, tracks and burrows) in the Bagh Beds of the Narbada Valley. Most of the material reported here comes from the sandy shales in the upper horizons of the Nimar Sandstone, only a few *species* being from the Nodular Limestone. From the study of only a part of our collection of these fossils we have carried out so far, we have been able to identify the following *species*:

Arthropodichnus indicus gen. *et* sp. nov., *Diplopodomorpha* cretacea gen *et* sp. nov., *Dreginozoum orientale* sp. nov., *Nereites malwœnsis* sp. nov., *Oniscoidichnus communis* sp. nov., *O. ampla* sp. nov., *O. elegans* sp. nov., *O. robustus* sp. nov., *Permichnium bosei* sp. nov., *Tephrhelminthopsis subauricularis* sp. nov., *Tasmanadia sp. indet.*, *Asterosoma spatulata* sp. nov., *Biformites cf. insolitus* Linck, *Fucusopsis cf. angulatus* Vassoievitch, *Lœvicyclus mongrœnsis* Verma[3] *Phycodes gregarius* sp. nov., *Spongeliomorpha cf. iberica* De Saporta, and *Syringomorpha sp. indet.*

Trace Fossils are generally considered poor evidence for age consideration, and hence have been much neglected. But it is of interest to note that among those that we have identified, are *Dreginozoum orientale* sp. nov., *Asterosoma spatulata* sp. nov, and *Fucusopsis cf. angulatus* Vassoievitch which have close resemblance to forms from Upper Cretaceous of U.S.S.R. and Germany; also, while *Tephrhelminthopsis*, a Tertiary *genus* is found by us to extend down into these mid-Cretaceous rocks, several other *genera* known to be confined to older periods are now found to range upwards into the Cretaceous.[1]

The only arthropods known till now to occur in the Bagh Beds, and of which we have any detailed information, are some ostracods described by Jain.[2] But the several arthropod tracks which we have now found occurring in these strata make an important addition to the arthropodous fauna of the Bagh Beds and would provide us additional material for studying the faunal affinities of these rock-formations with those in other basins of sedimentation.

Among the fossils reported here *Arthropodichnus* and *Diplopodomorpha* are myriapod, and being terrestrial air-breathing forms, have important bearing on the conditions under which the Nimar Sandstone was deposited.

In view of what has been reported above there is evidently a need for making a more rigorous search for such fossils from these rock formations, and their detailed study should prove fruitful.

A fuller account of these fossils will appear elsewhere.

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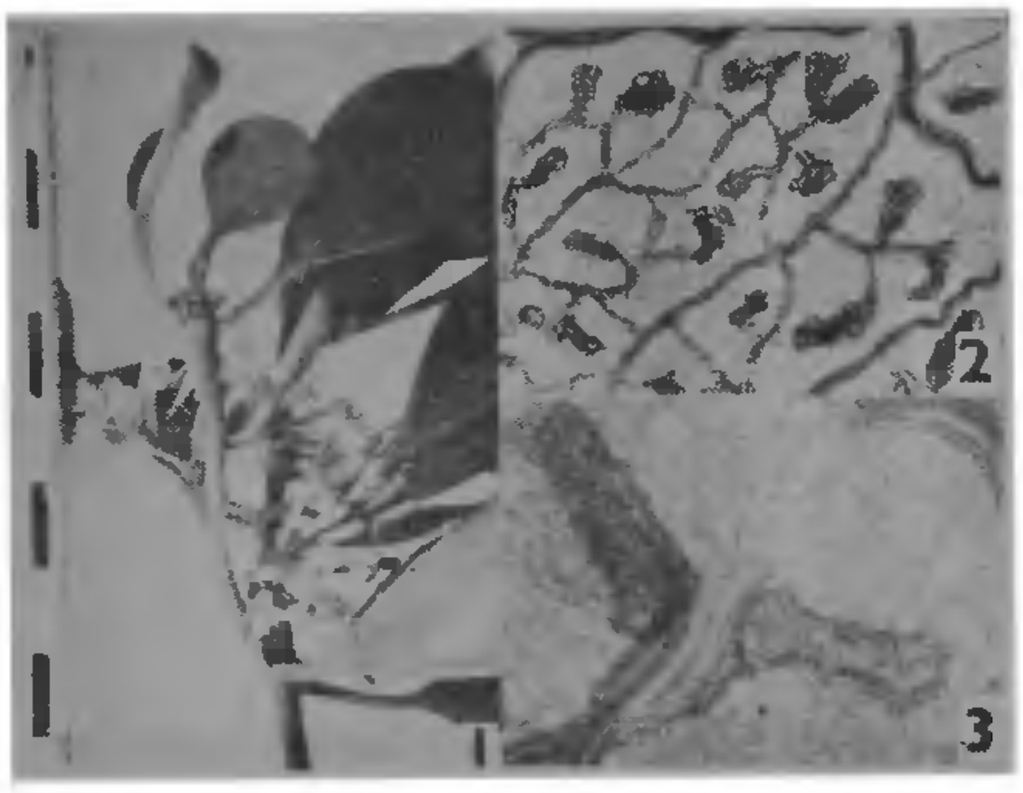
A NEW RECORD OF FOLIAR SCLEREIDS IN *SCYPHIPHORA HYDROPHYLLACEA*

WHILE studying the sclereids in certain mangrove plants of Singapore, palosclereids were observed in the leaves of *S. hydrophyllacea* Gaertn., a member of Rubiaceæ. *Scyphiphora* consists of one species, Indo-Malayan in distribution. Foliar sclereids are reported in only three genera of this family so far, namely, *Burchellia*, *Chomelia*, and *Coffea*.[1-3] The cellular characters and distribution of the sclereids in *S. hydrophyllacea* are briefly discussed here. Foster's[4] methods were followed to obtain the leaf clearings, sections and macerations.

S. hydrophyllacea is a common coastal tree of Singapore and Malaysia, growing to a height of 40–50 feet.[5] The evergreen tree can be easily identified by the presence of reddish or brownish twigs, and fleshy, obovate leaves (Fig. 1). The terminal and axillary buds glisten due to the surface deposition of resin. On an average the leaf measures 57 mm. long, 38 mm. wide at the broadest point, with an area of 1,524 sq. mm. An examination of cleared mature leaves reveals the distribution and association of sclereids with terminal veinlets. Studying their relationship with ultimate veinlets indicates that 98% and 2% of them are terminal and diffuse in their distribution respectively (Fig. 2). It is common that 2–3 sclereids overlap on each other at the distal or sub-distal portions of these veinlets (Fig. 3).

The leaf is a dorsiventral structure, 385 μ thick as seen in transections with 2–3 hypodermal layers arranged next to the upper epidermis. Palisade mesophyll is also 2–3-layered. The spongy mesophyll is 9–10-layered loosely arranged, with many air spaces characteristic of this tissue in other mesophytes.



FIGS. 1–3. Fig. 1. Portion of a twig showing leaf arrangement (cm. scale). Fig. 2. A portion of cleared lamina showing terminal distribution of sclereids, × 55. Fig. 3. Enlarged picture showing vein endings, overlapping sclereids (left) and pits on sclereid wall (right), × 420.

In distribution, the sclereids are generally confined to the upper layers of spongy parenchyma, mostly associated with the vascular bundles or present very close to them. Ontogenetic studies are necessary to trace the origin and development of sclereids from the young mesophyll cells. The individual sclereid cell on an average measures 129 × 41 μ, with a thick (5·1 μ), pitted cell wall, and a wide central lumen. Both in leaf clearings and transections, the sclereid cell shows a somewhat irregular rectangular outline with small projections here and there, and the shape of the sclereid cell is not very variable. Recently, De Roon[6] has reclassified the sclereids and distinguished the palosclereids and rhizosclereids using such characters like cell shape, ramifications of the cell, cell wall thickness, lamellation, etc. The sclereids of *S. hydrophyllacea* belong to the category palosclereids. The number of sclereids in a microscopic field (68/area = 1·62 mm.^{2}) is determined; and if the total number of sclereids per leaf is calculated on this basis, it would be approximately 63,650. In the narrow sub-marginal area the sclereids are absent, and in the rest of the laminar region the sclereids are uniformly distributed. The transverse sections of the stem are also examined and only brachysclereids are present in the pith region, either singly or in small groups of 2–3.

Apart from the genetical characteristics, the resultant shape and to a certain extent the structure of an individual foliar sclereid cell is largely controlled by the compactness of surrounding mesophyll cells amidst which it develops. Other details and exceptions to this general trend of development are discussed by earlier authors.[6-7] The palosclereids are simple structures, small in size, when compared with the other categories of sclereids reported in different taxa.[8–10] Further, these are distinguishable from rhizosclereids in that they have no root-like projections.[6] Studies concerning morphogenesis of sclereids in this species are in progress.

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KARYOTYPE STUDY OF *COLOCASIA ANTIQUORUM* SCHOTT.

Colocasia antiquorum belongs to the family Araceae and tribe Colocasioideae. It grows wildly in marshy areas and is non-edible. A karyotype study in this species is reported here.

For karyotype study, pretreatment of root tips with 0·25% colchicine solution for five hours yielded adequately condensed and well-spread metaphase figures.

The chromosome counts and the karyotype analysis were made from metaphase stages. In all metaphase stages the chromosomes were found to be 22 in number ($2n = 22$) (Fig. 1, A). Out of the 11 pairs ($n = 11$), 5 pairs were metacentrics and 6 pairs were submetacentrics (Fig. 1, B). Acrocentric chromosomes were totally absent in all cells. The chromosomes were comparatively small in size and did not show much difference in morphology, size and shape among different pairs.

Karyotype study of this species brings out some features of cytological interest. The