

(outer and inner) smooth, 2–4 μ thick. Lateral chords one-third body width wide near middle. Lip region not off-set, 18–24 μ wide. Amphids small, obscure, near base of lateral lips. Buccal cavity 22–23 \times 10–13 μ with strongly cuticularized walls. Dorsal tooth large, thorn-like, situated on anterior half of the dorsal sector, pointing forward, opposed by six transverse rows of minute denticles spreading round the subventral walls as rasp-like area. Apex of dorsal tooth 17–20 μ from the base of stoma. A pair of small blunt subventral teeth opposite the base of dorsal tooth. A pair of foramina on the subventral plates of stoma near the posterior end.

Oesophagus nearly cylindrical forming a collar around the base of stoma, 260–275 μ long. Nerve ring 124–132 μ from anterior end. Rectum 24–28 μ , less than one anal body-width long. Gonads amphidelphic and reflexed. Anterior and the posterior ovary 58 μ and 80 μ long, respectively, each having 5–6 oocytes arranged in a single file. Proximal part of oviduct glandular. A fairly developed sphincter is present at the oviduct uterus junction. Cuticularized piece at vagina-vulva junction. Vulva post-equatorial. Egg 95 \times 35 μ . Tail arcuate-conoid, 38–40 μ long. Caudal glands tandem. Spinneret terminal.

Male.—Spicules 19 μ long, gubernaculum 13 μ and lateral accessory piece 8 μ . Supplements 6. Tail 35 μ long about twice the anal body-width long.

Type habitat and locality.—Soil around roots of cauli flower, *Brassica oleracea* var. *botrytis* from Jodhpur, Rajasthan.

Type specimens.—Collected by Mr. G. R. Soni on October 25, 1979. Holotype female on slide No. 113, paratype females on slide No. 114 and paratype male on slide No. 115, deposited in the Department of Zoology, University of Jodhpur, Jodhpur.

Differential diagnosis

On the basis of key provided by Jairajpuri¹, *Mylonchulus brassicus* sp. n. comes closest to *M. nainitalensis* Jairajpuri, 1970 in amphidelphic gonads, tandem arrangement of caudal glands, number of transverse rows of denticles and size of gubernaculum but differs in distribution of transverse row of denticles, terminal spinneret, size of spicules (19 vs. 35 μ) and number of supplements (6 vs. 12). It is distinguished from *M. mulveyi* Jairajpuri, 1970 where male has been described recently by Ahmed and Jairajpuri², by the didelphic gonads in female and smaller size of spicules and 6 instead of 8 supplements in male.

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Department of Zoology,
University of Jodhpur,
Jodhpur 342 001, January 4, 1980.

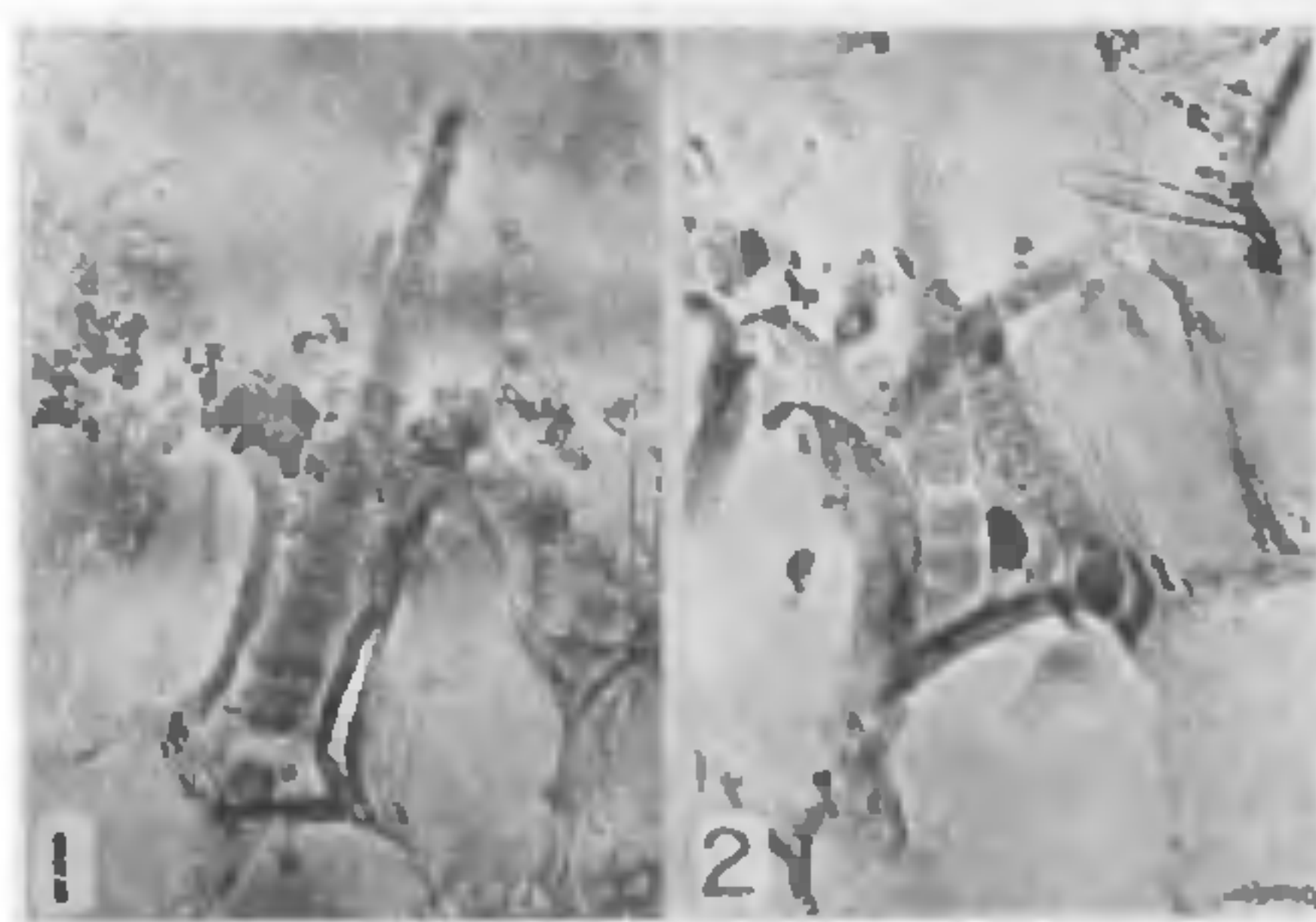
G. R. SONI.
H. S. NAMA.

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RIVULARIA AQUATICA DE WILDE AS A PARASITE ON GRIFFITHELLA HOOKERIANA WARM.

HETEROTROPHIC nutrition among the bluegreen algae is admittedly a rare phenomenon. The only recorded instances are certain species of *Anabaeniolum*, *Oscillospira* and *Simonsiella* which have been reported to be parasitic on man and in the intestines of animals¹. During the course of an extensive study on the developmental anatomy and embryology of the Podostemaceae certain cells of the dorsal epidermis of the thallus of *Griffithella hookeriana* were seen to be infected by *Rivularia aquatica*. The latter taxon has been otherwise known to be an autotroph as other bluegreens. However, it does resort to other modes of nutrition is evidenced in the present case.

Microtome sections (8 μ m) of the host plant revealed that the cells in which the alga occurred were depleted of their contents. The special circumstances that act incumbent on the organism to become parasitic appears to be the lowering of the water level of the habitat as a result of which the thallus is exposed to dry conditions. Under the changed influences, the heterocysts are seen to undergo divisions as a result of which many filaments partly grow out of the epidermis of the thallus (Figs. 1, 2). These features strongly suggests a parasitic mode of existence for *Rivularia aquatica*.



FIGS. 1-2

Habitat: The host plant was collected from the Netravati River, about 5 km from Dharmasthala,

Karnataka State. The slides have been preserved in the Botany Department.

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Department of Botany,
University of Mysore,
Manasa Gangotri,
Mysore-6, May 14, 1980.

S. P. HOSMANI,
C. R. NAGENDRAN.

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FLORAL ANATOMY OF *SESAMUM ALATUM* THONN

A PERUSAL of the literature reveals that the vascular anatomy of the flower of the family Pedaliaceae did not receive adequate attention. Rao¹ investigated the floral anatomy of three taxa and subsequently Singh²⁻³ described the floral anatomy of a few more taxa of the family. In the present communication the features of vascular supply in *Sesamum alatum* Thonn are described and compared with those already known for other pedaliaceous taxa.

The flower is pedicellate (Fig. 1), tetracyclic, pentamerous except the gynoecium, bisexual, zygomorphic and hypogynous. The calyx is gamosepalous and the free limbs show valvate aestivation (Figs. 14-16). The gamopetalous corolla divides into a large posterior and three anterior limbs which exhibit imbricate aestivation (Fig. 32). The posterior limb is a double structure formed by the fusion of the two posterolateral petals. The androecium comprises four fertile epipetalous stamens and a posterior staminode (Figs. 1, 19-21, 28). Each fertile stamen bears a multicellular gland at its tip (Fig. 1). The gynoecium is bicarpellary, syncarpous and the ovary is bilocular at the base and apex (Figs. 17, 23, 24) but becomes four locular in the middle region owing to the development of a false septum from the inner surface of the ovary wall opposite the dorsal bundle and bears numerous ovules (Figs. 18-22). The single style (Figs. 1, 26, 28, 29) terminates in a two-lobed stigma. The inner surface of the lobes are lined by glandular papillose cells (Figs. 32). The hypogynous disc is vascularised (Fig. 1).

The pedicel shows a ring of vascular tissue which expands in the thalamus (Fig. 2) and from this ten strong traces arise (Figs. 3-5). Of these, five function as sepal midribs and the remaining five besides giving off the sepal lateral traces, function as petal midribs (Figs. 6, 7). There is thus adnation between sepal

lateral and petal median traces. The traces supplying the perianth parts divide further forming smaller bundles in the respective organs (Figs. 8-16, 9-21, 28, 32). Rao (1955) and Singh (1960a, b) reported adnation between perianth and staminal traces in *Sesamum indicum*, but only adnation between sepal lateral and petal midrib traces is discerned in *Sesamum alatum* (present study).

After the demarcation of perianth traces, five staminal traces arise independently from the main stele and the trace for the posterior staminode is weakly developed (Figs. 8-11) and enter the bases of the staminal filaments at the level of their separation from the corolla (Figs. 19-21). The posterior staminodal trace terminates at the place of the separation of the staminode from the corolla without entering it (Fig. 19). The anterolateral stamens separate from the corolla at a lower level than the posterolateral stamens (Figs. 19, 20).

The staminal traces divide radially and prior to the entry into the filaments exhibit horse-shoe arrangement (Figs. 19, 20). After entering the filaments they become arranged in a ring (Fig. 21). In the connective region the staminal bundles become tangentially flattened and from the sides two branches are given off ; these bend downwards and extend towards the base of the each anther lobe (Figs. 27, 28).

After the emergence of the staminal traces, the main stele gives off a number of traces which supply the massive disc (Figs. 8-13). Thus, the disc in this taxon can be interpreted as receptacular in nature. In *Sesamum indicum* Rao¹ the disc receives vascular supply from the branches given off by the four traces for the fertile stamens as well as those arising from the main stele.

After feeding the disc, the remaining stele reorganises into a more or less complete vascular cylinder. From this, two lateral units of vascular tissue become organised and the rest of the stele diverges out, in the form of a number of traces which along with the branches arising from the lateral units, as well as a few of the disc traces supply the wall of the ovary (Figs. 13, 14). Some of the disc traces also extend into the ovary wall. The lateral units divide tangentially forming a pair of common ventral bundles and a pair of common median lateral bundles to the inside and outside respectively (Figs. 14, 15). Thus the carpels are 5-traced. In the ovule bearing region the common ventrals fuse and form a core of vascular tissue from which ovule traces demarcate (Figs. 16-21). Towards the top of the ovary this core of tissue splits into two bundles lying opposite the loculi (Fig. 22). The ventral supply is completely utilised in the ovular supply (Figs. 23, 24). The placentation is axile. The dorsal bundles extend into the style and terminate