

## ON TWO FORMS OF *HYDRURUS* AG. FROM KASHMIR.

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No member of the Chrysophyceæ,—a freshwater class of algæ characterised by the presence of brown or orange-coloured chromatophores and in great part naked protoplasts, and by the absence of starch,—has yet been recorded from India. The writer, on his way to Ladak (Kashmir) in June, 1931, collected two forms of *Hydrurus* Ag., described below. These two algæ were found attached to small stones, about 50 feet apart, submerged in shallow water of a narrow stream formed by melting of snow, at a distance of about three miles from Sonamarg, and at an altitude of about 9,000 feet above sea-level.

*Hydrurus foetidus* (Vill.) Kirchn. Agardh, *Systema Algarum*, p. 24, 1824; Wolle, *Freshw. Alg. U.S.*, Pl. 164, 1887; Lagerheim, *Ber. Deutsch. Bot. Ges.*, VI, p. 73, 1888; Pascher, *Süssw.-flora Deutsch. Oster. u. d. Schw.*, 2, Flagellata II, Fig. 139, a-c, 1913; Fritsch, *Struct. and Reprod. Algæ* I, p. 547, Fig. 181, 1935.

*Forma*, (Fig. 1, A).

Length of threads, up to 40 cm.; diameter of spherical cells, 6-12  $\mu$ ; length of ellipsoidal cells, up to 20  $\mu$ .

The length of the threads in this form is greater than that recorded for the type.

*Habitat*—Attached to submerged stones in a fast-flowing shallow stream, Sonamarg, Kashmir.

var. *indica* var. nov. (Figs. 1, B, and 2, A-C).

Thallus a branched system of thick reddish-brown and easily-breakable threads, composed of a soft, gelatinous and cylindrical axis, bearing long and short branches, distributed irregularly over its whole surface; both the main axis and the laterals being gradually attenuated towards their apices. Short branches of limited growth numerous, hardly seen with the naked eye, with their ends directed towards the apex of the main axis, simple when young (Fig. 2, A), richly branched when mature (Fig. 2, B) owing to the production of numerous short conical processes, arising usually irregularly and only occasionally in an acropetal order. Long branches of unlimited growth

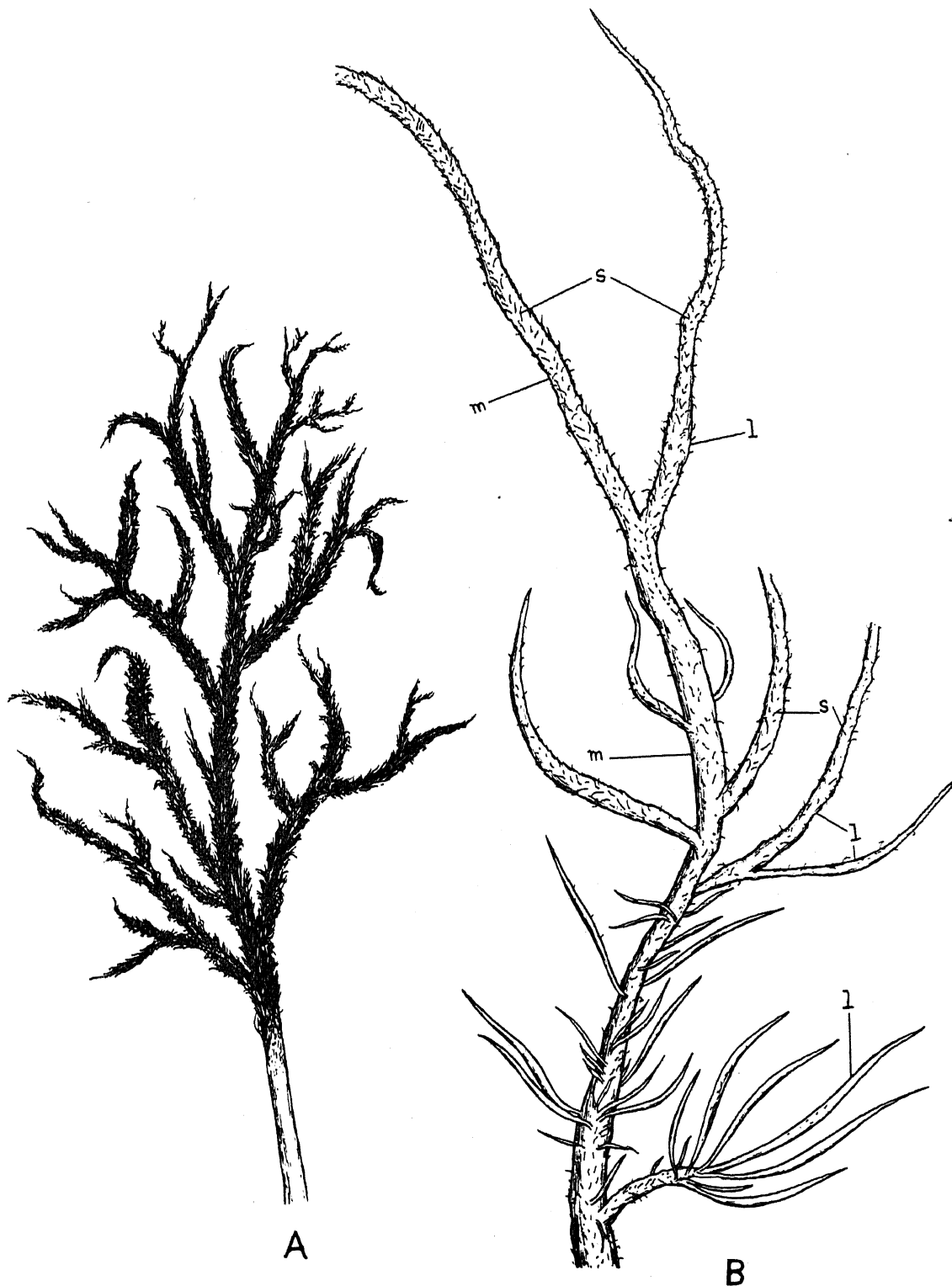


FIG. 1. *A*—*Hydrurus fætidus* (Vill.) Kirchn. *forma*, and *B*—var. *indica* var. nov. showing habit. *l*, long lateral; *m*, main axis; *s*, short lateral. *A*  $\times \frac{2}{3}$ ; *B*  $\times 2.6$ .

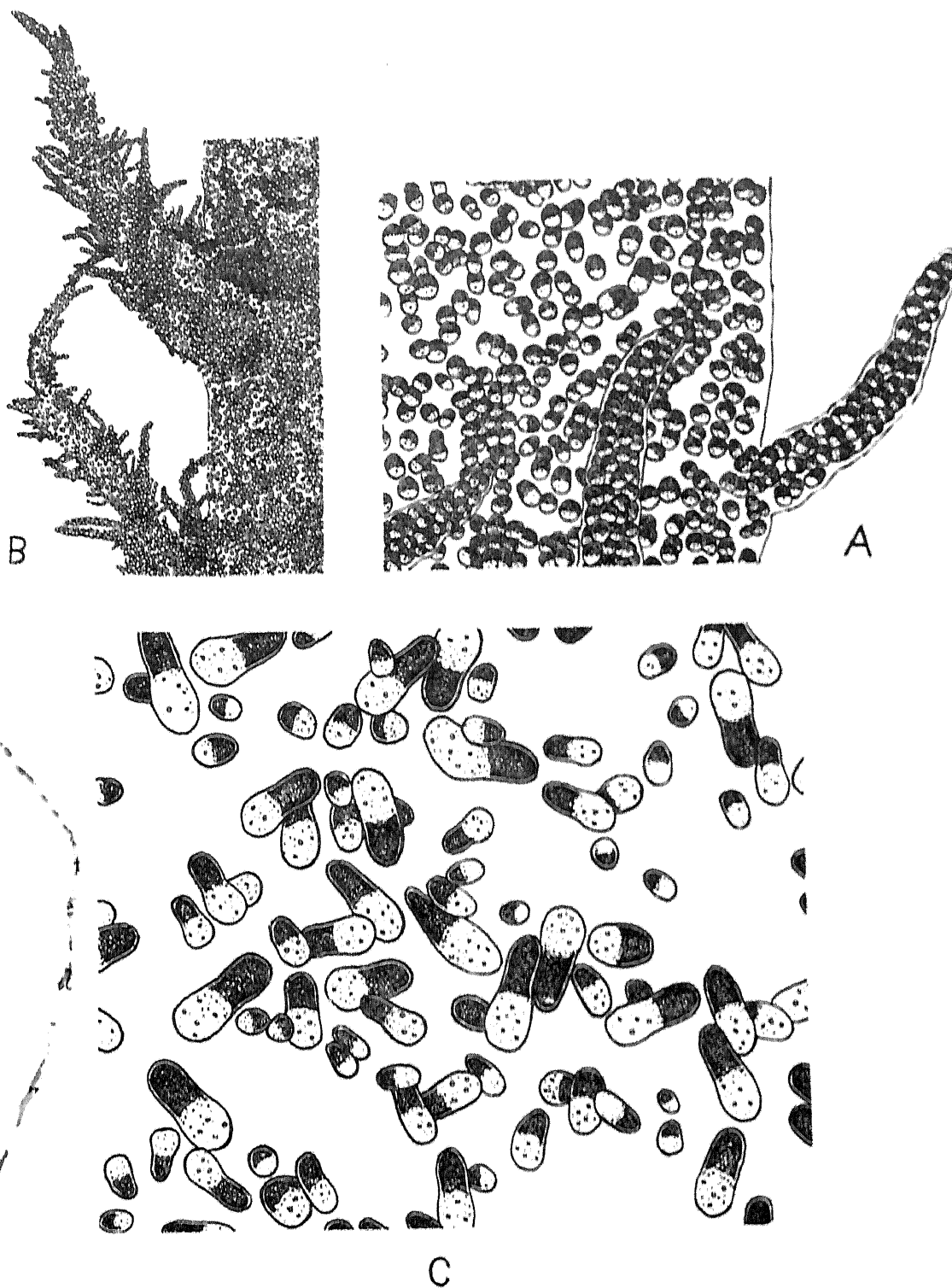


FIG. 2.—*Hydrurus foetidus* (Vill.) Kirchn. var. *indica* var. nov. *A* and *B*, portions of axis showing young and mature short laterals respectively; *C*, part of axis showing both young and mature cells of different forms. *A*×400; *B*×60; *C*×800.

sparingly formed, especially towards the apex of the main axis, and far less in number than the short ones, slightly attenuated towards the base when young, repeating the structure of the main axis, though generally not producing branches of unlimited growth. Cells naked, loosely aggregated in the centre than at the periphery in both the main axis and the laterals, at first almost spherical, later ellipsoidal, more or less dum-bell-shaped, club shaped or slipper-shaped (Fig. 2, C), with the posterior half, containing a few contractile vacuoles and some granules, usually broader than the anterior one, possessing a single chromatophore. Chromatophores cup-shaped in spherical cells, tumbler-shaped in elongated ones, without pyrenoids.

Length of threads, up to 10 cm. ; breadth of threads at their bases, 3 mm. ; diameter of spherical cells, 5-10  $\mu$ , rarely up to 12  $\mu$  ; length of elongated cells, 24-40  $\mu$ , rarely up to 48  $\mu$ .

*Habitat.*—The same as for the above form.

This variety differs from the type on account of its reddish-brown colour in fresh condition, the axis being branched (though sparingly) throughout its length, and the plant-body being not constructed to form any feathery tufts with a plumose appearance. It further differs in its branches arising irregularly and not in an acropetal order, and in the mature cells being much more elongated.

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