*Tribonema aequale* Pascher (Figs. 1–4).

Filaments dull yellowish-green in colour; cells 2–2½ times longer than broad, 11·5–16·0 μm long, 5·5–7 μm broad; chromatophores one, rarely two, parietal; pyrenoids absent; cell wall composed of 'H'-pieces, ends of filaments generally open, exhibiting one arm of 'H'-piece. Reproduction other than fragmentation not seen.

*Habitat* :

(1) Free-floating along with some desmids in a Pond at Pahargaon, near Port Blair (Andaman Islands), Coll. No. 33 F.
Date : 27–1–1978.

(2) Epiphytic on *Nitella* sp. in a fresh-water stream at Bedanabad, near Port Blair (Andaman Islands), Coll. No. 59 F.
Date : 27–1–1978.

The filaments and cells of plants collected from Bedanabad are slightly longer and broader than those from Pahargaon.

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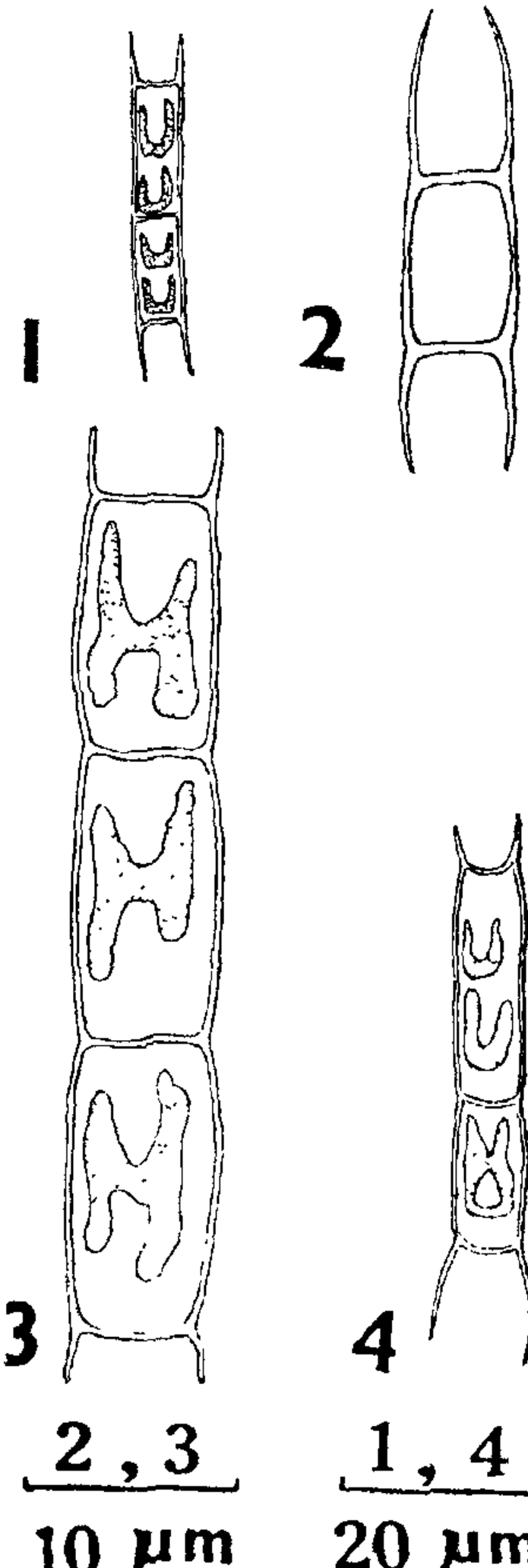


FIGS. 1–4. Fig. 1. Fragment of filament showing 2 chromatophores per cell. Fig. 2. Filament showing 'H'-pieces. Fig. 3. A magnified view of filament with single chromatophore per cell. Fig. 4. Filament showing variability in the morphology and number of chromatophores.

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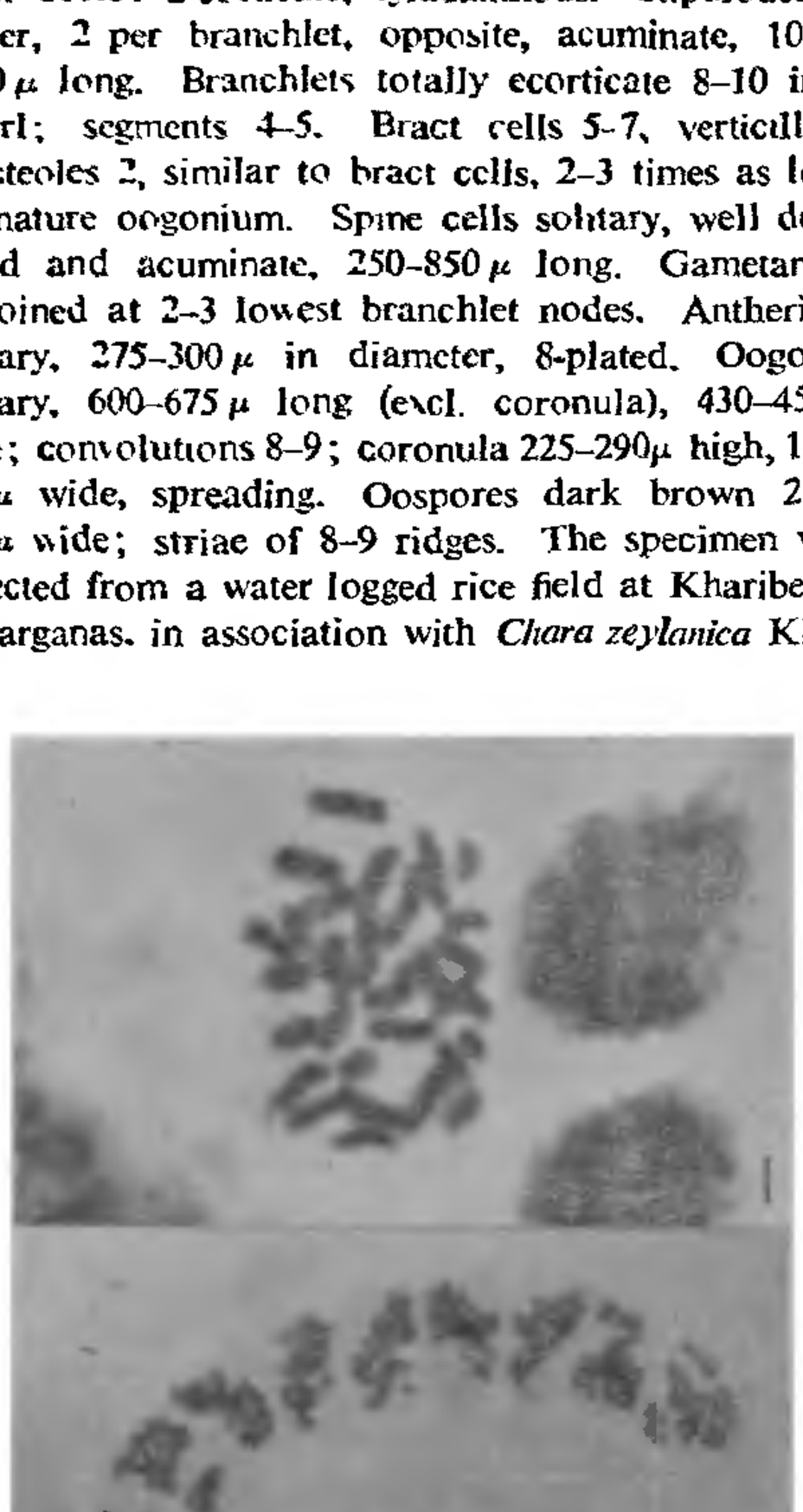
## *CHARA FIBROSA* VAR. *FIBROSA* f. *LONGICOROLLATA* : A NEW RECORD FOR INDIA AND ITS CYTOLOGY

IN the course of a detailed cytological investigation of the Charophytes of West Bengal, the author recently collected an interesting species of *Chara* which on close scrutiny was identified as *Chara fibrosa* Ag. ex Bruz. var. *fibrosa* f. *longicorollata* (Kasaki) R.D.W. following the recently published iconograph and monograph of the "Revision of Characeae"[1,2]. *Chara fibrosa* var. *fibrosa* f. *longicorollata* was originally described as a distinct species *C. longicorollata* Kasaki[3] from Northern Honshu, Japan, but later considered as a variety *longicorollata* of *C. benthamii* A. Br. by the same author[4]. This particular taxon was reported to be endemic in Japan and has so far not been reported to occur in India[5], has now been recorded for the first time in India. A brief description of the Indian material follows.

Plants monoecious, upto 15 cm high, heavily incrusted, pale green and brittle. Axis slender 425 $\mu$ in diameter; internodes 1–2 times the branchlet nodes. Stem cortex 2-corticate, tylacanthous. Stipulodes in 1 tier, 2 per branchlet, opposite, acuminate, 1050–1450 $\mu$ long. Branchlets totally ecorticate 8–10 in a whorl; segments 4–5. Bract cells 5–7, verticillate. Bracteoles 2, similar to bract cells, 2–3 times as long as mature oogonium. Spine cells solitary, well developed and acuminate, 250–850 $\mu$ long. Gametangia conjoined at 2–3 lowest branchlet nodes. Antheridia solitary, 275–300 $\mu$ in diameter, 8-plated. Oogonia solitary, 600–675 $\mu$ long (excl. coronula), 430–450 $\mu$ wide; convolutions 8–9; coronula 225–290 $\mu$ high, 160–200 $\mu$ wide, spreading. Oospores dark brown 285–300 $\mu$ wide; striae of 8–9 ridges. The specimen was collected from a water logged rice field at Khariberia, 24-Parganas, in association with *Chara zeylanica* Klein ex Willd. in the month of November, 1969. The same specimen was again recollected in early December, 1977 from the same locality for detailed cytological studies.



FIGS. 1–3. *Chara fibrosa* var. *fibrosa* f. *longicorollata*. Fig. 1. Mitosis in the antheridial filament showing $n = 28$ chromosomes in a metaphase plate. Fig. 2. An antheridial filament showing grouping of chromosomes at metaphase plates. Fig. 3. Antheridial filament showing cells with micronuclei.

Chromosome numbers of a number of Indian taxa within the *C. fibrosa* complex of Wood have already been published[6–13]. Thus in order to determine the chromosome number of this particular taxon, a cytological investigation was carried out in materials fixed in the field in 1 : 3 acetic-alcohol as well as those cultured under laboratory conditions and the number was determined to be $n = 28$ in the dividing nuclei of the antheridial filaments following propionic-orcein staining[14] (Fig. 1). The number is recorded for the first time in this taxon. Chromosome size ranges between 4·5 $\mu$ and 1·5 $\mu$. Mitosis was, however, not found to be very regular. Some degree of irregularities were noted such as grouping of chromosomes (Fig. 2), cells with micronuclei (Fig. 3) and lagging of chromosomes during anaphase separation. A pair of chromosomes appeared to be sticky and thereby often resulted in a pseudo bridge at anaphase. All these facts indicate its hybrid constitution. It is likely that this polyploid form, with $n = 28$ chromosomes might have been originally derived from crossing of two different taxa under *C. fibrosa*.

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## EFFECT OF SOIL APPLICATION OF CARBOFURAN IN SPLIT DOSES ON THE CONTROL OF THE RICE ROOT NEMATODE

THE root nematodes *Hirshmanniella* spp. are widely distributed in lowland rice soils in India causing 25 to 70% losses in grain yield[1,2]. Varying degrees of control of this nematode were obtained with halogenated hydrocarbon organophosphate and carbamate pesticides[3,4]. Soil treatment with carbofuran for once at 1·2 or 2 kg a.i./ha[5,6] or thrice with 1·5 kg/ha each time[7,8] was reported to be effective. With the objective of determining the time of application of carbofuran for economic and effective control, a field with a uniform distribution of *H. mucronata* was selected and 15 plots each measuring 5 *m* × 5 m were laid out. Healthy seedlings of the rice c.v. *Padma* at 35 days age were transplanted in plots in lines at 20 cm × 15 cm spacing.

The following 5 treatments, *viz.*, soil application of carbofuran at 1 kg a.i/ha at the time of planting ($T_1$), this followed by post-planting application of the same amount for once ($T_2$), twice ($T_3$) and thrice ($T_4$) at intervals of 15 days and an untreated control ($T_5$) were introduced in 3 replications. Nematode populations in soils and roots of crops were estimated before planting at flowering and at harvesting from all plots[5].

Maximum numbers of *H. mucronata* were found in roots and soils of untreated plots ($T_5$) both at flowering and at harvest of crops (Table I). The plots receiving basal application of carbofuran ($T_1$) had significantly low population of nematodes and higher grain yield but were inferior to the other carbofuran treatments which were on par. These findings confirmed the earlier reports on the effectiveness of carbofuran against the nematodes[7,8] and suggest that application of 1 kg/ha to soil as basal dose and again at 15 days after planting would be adequate to keep the *H. mucronata* populations below the economic injury level.

TABLE I

*Efficacy of carbofuran* (1 *kg/ha*) *to soil application to soil in controlling the root nematodes* (Hirschmanniella mucronata) *in rice var* Padma

(Means of 3 replications)

| Treatment (Soil application of carbofuran) | | Population of *H mucronata* at planting soil (500 g) | at flowering root (1 g) | at flowering soil (500 g) | at harvest root (1 g) | at harvest soil (500 g) | Grain yield T/ha |
|---|---|---|---|---|---|---|---|
| $T_1$ | At planting | 012 | 100 | 90 | 300 | 460 | 3·70 |
| $T_2$ | $T_1$ + 15 d.a.p. | 110 | 19 | 36 | 40 | 169 | 4·00 |
| $T_3$ | $T_2$ + 30 d.a.p. | 103 | 12 | 16 | 50 | 35 | 4·26 |
| $T_4$ | $T_3$ + 45 d.a.p. | 103 | 14 | 33 | 36 | 40 | 4·25 |
| $T_5$ | Untreated control | 102 | 244 | 338 | 913 | 1126 | 3·20 |
| C. D. 0·05 | | | 4·7 | | 12·7 | | 0·43 |

d.a.p.—Days after planting.

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