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A NEW CHROMOSOME NUMBER REPORT FOR *CHARA GLOBULARIS* VAR. *LEPTOSPERMA* F. *LEPTOSPERMA*

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DURING a recent survey of the Charophyte flora of West Bengal[1–4], a population of *Chara globularis* Thuill. var. *leptosperma* (A. Br.) R. D. W. f. *leptosperma* R. D. W., were collected from a permanent freshwater pond in Hridaypur, North 24, Paraganas, West Bengal. This taxon belongs to section and sub-section—*Grovesia* (sensu Wood) and is reported for the first time from this part of the country[5–9]. A brief description of the collected material is given below:

Plants monoecious, 15–20 cm high. Axes 412.5–577.5 μm in diameter; cortex 3-corticate, isostichous; spines represented by globular cells, to 66 μm in diameter. Stipulodes diplostephanous, 2 sets per branchlet, upper tier much more developed than lower tier, uppers 495–528 μm long. Branchlets 8–9 in a whorl, 0.8–1.2 cm long; segments 7–8, all the segments except two uppermost ones are corticated. Bract cells 4–6, posterior one shorter. Bracteoles 2, almost equal in length with oogonimum. Gametangia conjoined at lower three branchlet nodes. Oogonia 528–577.5 μm long; 363–396 μm wide. Coronula cells 115.5–132 μm high. Oospores black, 495–528 μm long, 197–330 μm wide; striae of 11–12 low ridges. Antheridia 165–198 μm in diameter octascutate.

The taxon was identified by studying the morphological characters noted above and following the Monograph and Iconograph *Revision of Characeae*[10]. Squash preparations from antheridial filament cells (figure 1) for ascertaining the chromosome number and studying the chromosome morphology, were made following the pre-treatment schedule worked out by the present authors[4]. To achieve a rapid and very effective staining schedule, the Lactopropionoorcein staining and fixation procedure of Dyer[11] was adopted. For the first time this procedure was applied for chromosome preparations of species of *Chara*. Preservation of temporary squash preparations became easier with the use of lactic acid, with no deterioration of staining, more contrast and above all a rapid method. Addition of formalin to Carnoy's fixative prevented the bubbles which often distort large chromosomes. Thus, an ideal combination of proper pre-treatment, rapid fixation and effective staining was achieved.

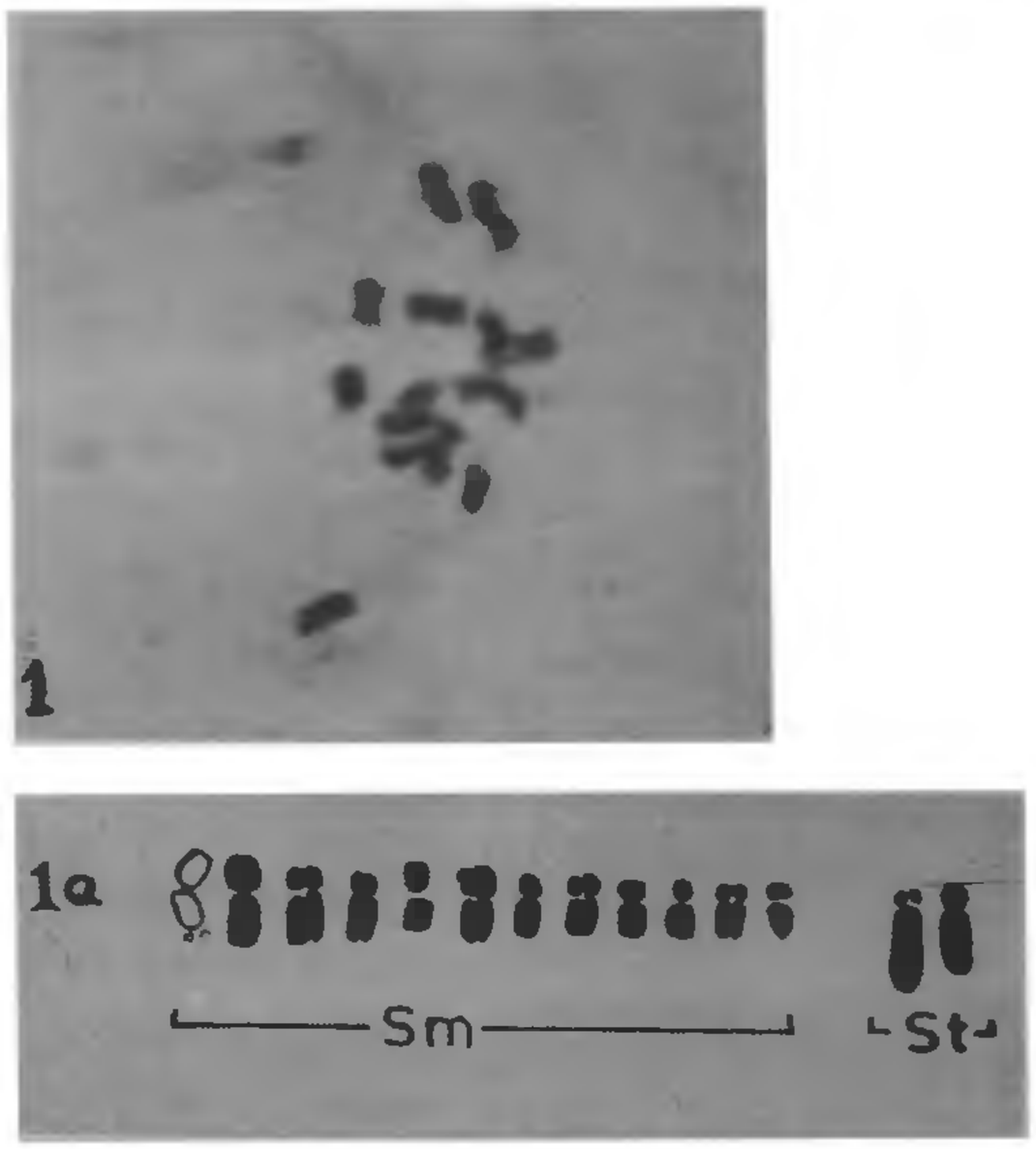

Figure 1 and 1a. A squash preparation of pre-treated antheridial filament cell showing ($n=14$) chromosomes (× 1500), **1a.** Karyogram of the same.

The chromosome number for this population was recorded as $n=14$ (figure 1), which is reported for the first time in this taxon[12–16]. Previous count was ($n=28$) and the material was collected from Madhya Pradesh[13]. The length of the chromosomes varied from 2.30–4.60 μm. Chromosome morphology was designated after Levan *et al*[17]. Chromosomes were also categorized according to the length after Khan and Sarma[18]. Total form per cent calculated following Huziwara[19] was 37.71. From the data collected, the karyotype formula was derived as $L(0)+M(Sm_6+St_2)+S(Sm_6+m_0+St_0)$, where *L*, *M* and *S* stand for long, medium and short-sized chromosomes respectively and *Sm* denotes sub-

median; *m*, median and *St*, sub-terminal chromosomes. From the karyogram (figure 1a) it is clear that there is no medianly constricted chromosome. A single chromosome with secondary constriction was found and it belonged to the *Sm* category. The new chromosome number of $n=14$ establishes the occurrence of polyploid races of this taxon in India. In view of different chromosome numbers and distinct karyotype recorded in the present investigation, it can be assumed that *C. globularis* var. *leptosperma* f. *leptosperma* should be regarded as a distinct entity as was originally done by Braun[20] rather than considering it as a variety of *C. globularis* as recommended by wood[21], and Wood and Imahori[10].

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INDUCTION OF PROLINE ACCUMULATION BY GAMMA IRRADIATIONS IN BERMUDA GRASS [*CYNODON DACTYLON* (L.) PERS.]

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PROLINE accumulation in plants has been noticed as a result of water stress[1], water logging[2], temperature fluctuations[3–5], nutritional deficiencies[6], fungal infections[7] and even air pollutants[8]. Though different consequences of such accumulation have been visualized and roles suggested[9–13], its physiological significance remains speculative. Presently, while studying the effects of γ-irradiations on diploid ($2n=18$), triploid ($2n=27$) and tetraploid ($2n=36$) taxa of *Cynodon dactylon* (L.) Pers. in a bid to enlarge their gene pool, proline accumulation in these plants, growing under uniform nursery conditions, was noticed. The plants were raised from parts of rhizomes that were exposed to γ-irradiations of 5, 7.5 and 10 kr from ^{60}Co source that provided approximately 3.337 kr/min at the Department of Radiology of the Post-graduate Institute at Chandigarh. Preliminary observations indicated that in diploids doses beyond 5 kr, and in triploids and tetraploids, treatments beyond 10 kr were detrimental. The control and irradiated plants were grown in pots containing similar type of garden soil. Plants were sprinkled with water on alternate days. For free amino acid determinations[14,15], 3–5 leaves, just at the time of emergence of the inflorescence, were collected from erect culms.

Irradiation treatments were observed to be slightly promotory in respect of total free amino acid content. All the three taxa registered a marginal increase. The amount (mg/g dry leaf wt) increased from 10.80 ± 0.02 to 11.25 ± 0.03 in diploids, from 8 ± 0.08 to 10.10 ± 0.60 in triploids and from 10.50 ± 0.01 to 11.90 ± 0.06 in tetraploids. A linear relationship between the amount and intensity of irradiation was noticed in respect of some amino acids (figure 1). Whereas proline and arginine concentrations exhibited a progressive increase with