

The constancy of the chromosome number  $n = 14$  in most of the taxa of this complex is significant from an evolutionary point of view. *C. braunii* exhibits minor karyotypic variations which may be associated with phenotypic changes. All the forms of *C. braunii* complex show minor phenotypic differences between one another and it appears that in *C. braunii*, the structural alterations of chromosomes are associated with the evolution of phenotypic variations. Karyotypic asymmetry within the complex is natural but the majority of taxa in this complex has a dominance of metacentric and submetacentric chromosomes. It is evident from the present study that *C. braunii* f. *novi-mexicana* is a close representative of *C. braunii* complex due to the similarity in karyotypic organization and chromosome number.

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#### NULLISOMIC-TRISOMIC IN *COIX GIGANTEA* (POACEAE)

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WHILE aneuploids on the negative and positive sides of the disomic constitutions have been reported in many plants<sup>1</sup>, higher polysomics<sup>2,3</sup> occur with extreme rarity. Addition and/or subtraction of different chromosomes at a time, in a diploid constitution is still a rare phenomenon, tetratrismic<sup>4</sup> ( $2n + 2 + 1$ ) and monotrosomic<sup>5</sup> ( $2n - 1 + 1$ ) being the only two-in-one aneuploids reported so far. A new double-aneuploid constitution, nullisomic-trisomic ( $2n - 2 + 1$ ), in *Coix gigantea* is reported here.

*C. gigantea* Koen. ex. Roxb. ( $2n = 20$ ) belongs to the tribe Maydeae of family Poaceae<sup>6</sup>. Seeds of this species were collected from the Purandar Fort (Maharashtra) and a small plant population is maintained at the botanical garden of this University. Typical meiotic nondisjunction of a bivalent<sup>7</sup> and irregularities in the chromosomal segregation due to limited desynapsis<sup>8</sup> led to the formation of aneuploid gametes. The plants being of the open-pollinated type, it resulted in a range of aneuploid individuals, through spontaneous cross-fertilizations<sup>9</sup>. A telotrismic plant ( $2n = 20 + 1$ ) obtained from among the progeny was selfed by completely enclosing it in a muslin cloth bag with the onset of flowering. The selfed progeny consisting of about 60 plants was cytologically-screened by fixing immature male racemes of every individual plant

separately in acetic-alcohol (1:3) and squashing young anthers in aceto-carmin (1%). Among these one nullisomic-trisomic plant was detected that was deficient in a complete bivalent, but at the same time carried another extra chromosome in the complement ( $2n = 19$ ,  $2n - 2 + 1$ ). Most PMCs showed eight bivalents and a trivalent at diakinesis (figure 1) although configurations showing nine bivalents and a univalent (figure 2) were not uncommon. At metaphase, the trivalent regularly orientated at the equator along with eight bivalents (figure 3). The overall meiosis was regular giving deficient but viable pollen. Usually aneuploidy adversely affects the health, survival and fertility of individuals<sup>1-4</sup> but nullisomic-trisomic of *C. gigantea* is exceptional in being healthy and fertile, as are also

its nullisomic ( $2n - 2$ ,  $2n = 18$ )<sup>10</sup> and monotrismic ( $2n - 1 + 1$ ,  $2n = 20$ )<sup>5</sup> constitutions.

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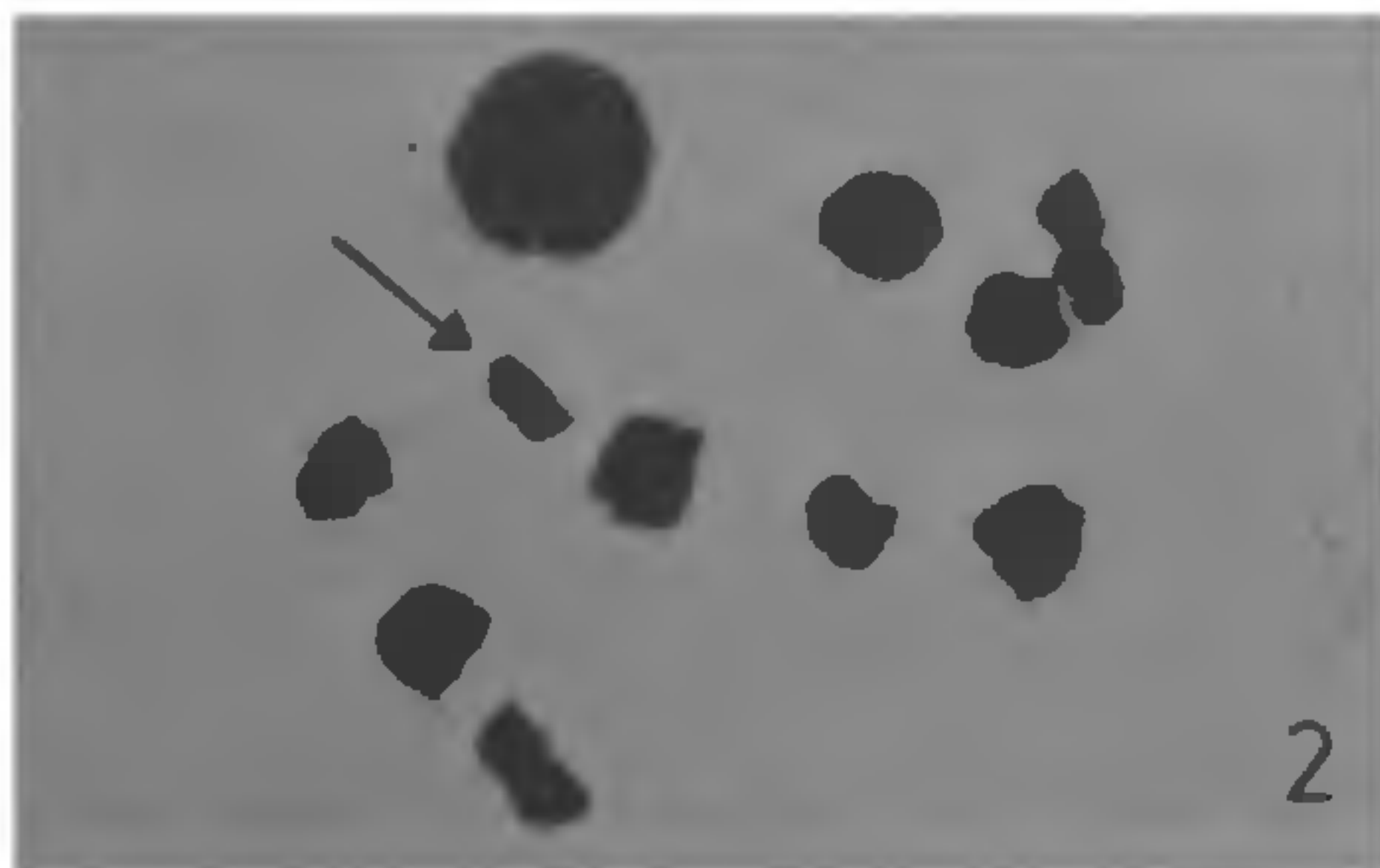
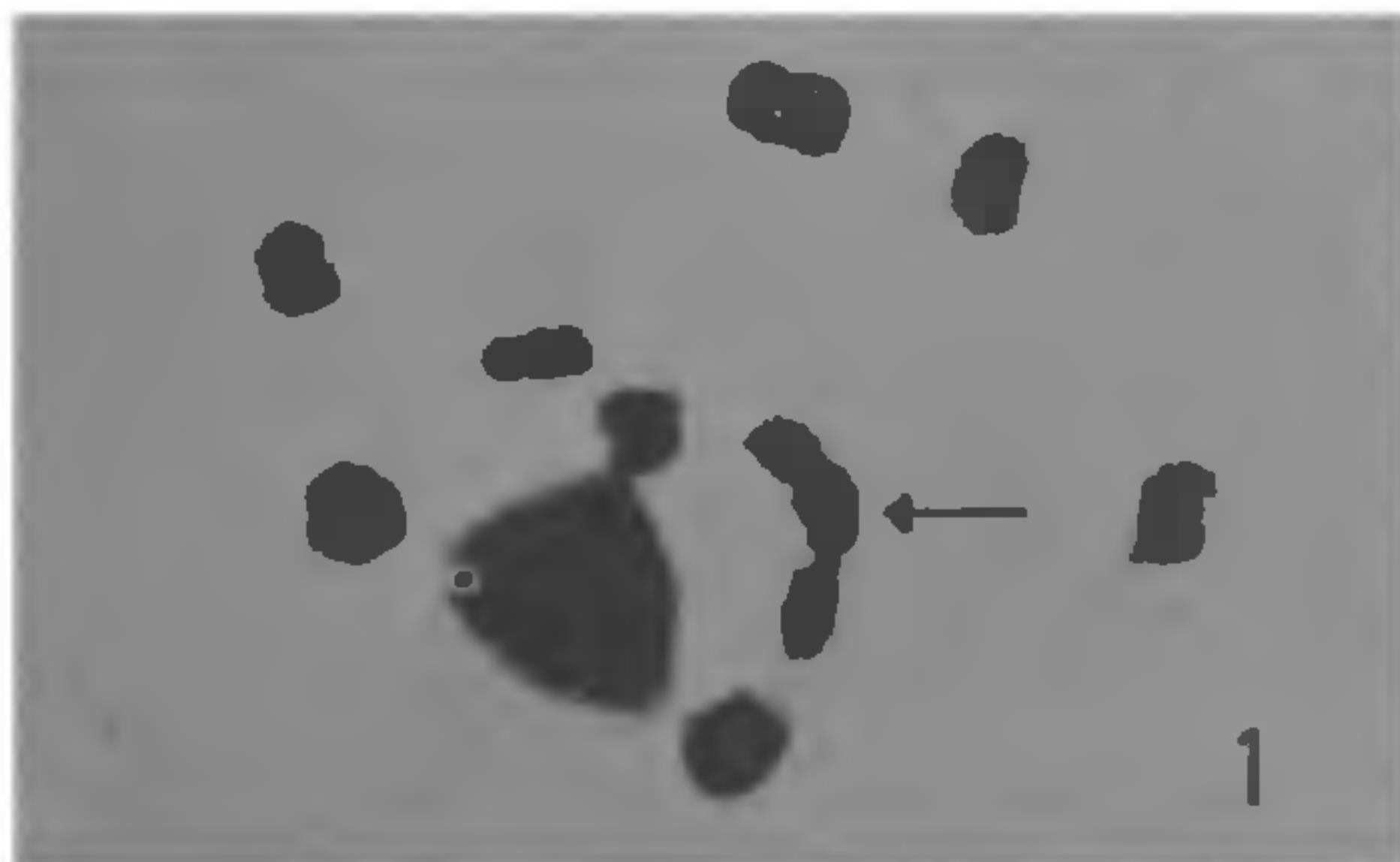
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#### PRODUCTION OF SHEATH OF *CALOTHRIX MARCHICA* LEMM IN PHOTO AND CHEMOHETEROTROPHIC CULTURE

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IN continuation of our investigations on the heterotrophic growth of various cyanobacteria<sup>1-3</sup>, the present work was undertaken to study the effect of various organic compounds on the growth of a filamentous cyanobacterium *Calothrix marchica* Lemm var. *intermedia* Rao under various growth conditions. The conditions for cultivating the organism and the procedure to determine the growth were described earlier<sup>3</sup>. Allen and Arnon's nitrogen-free medium<sup>4</sup> was used. The growth experiments were conducted in light in the presence of  $10^{-5}$  M DCMU (the concentration at which autotrophic growth of *C. marchica* was completely inhibited) and in dark with various organic carbon compounds (viz. sucrose, glucose, fructose, mannose and xylose) as a



Figures 1-3. Meiosis in the nullisomic-trisomic ( $2n - 2 + 1$ ,  $2n = 19$ ) *C. gigantea*. 1. and 2. Diakinesis showing eight bivalents and a trivalent and nine bivalents and a univalent. 3. Metaphase-I showing normal orientation of eight bivalents and a trivalent (trivalents and univalents arrowed) ( $\times 3,000$ ).