

tion in comparison to controls (table 1). The parthenogenetic embryos formed from such magnetically treated megaspores were always greater compared to their respective controls irrespective of the duration of magnetic field. The percentage of enhancement did not exactly correspond to the enhanced duration of the magnetic field.

It can therefore be stated, that magnetic field in regulated doses above 2.30 h time period does affect embryo formation and subsequent development of sporelings in varying degrees in *M. diffusa* var. *approximata*. It will be relevant to mention here that the effect of magnetic stimulus is known to change the growth and development in many angiosperms^{2,3}. Such studies have so far been restricted to angiosperms and this is the first report of a fern material taken up for such studies.

The results indicate that a magnetic field of 10.2 kG enhances embryo formation in isolated megaspores of *M. diffusa* var. *approximata*. It is interesting to observe the magnetic effect on reproductive capacities of a plant. Study of the effect of magnetic field on various facets of sporeling growth is an interesting field of observation and is being continued.

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ASTEROCOCCUS, UNDER HIGH ALTITUDE COSMIC-RADIATIONS

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The present communication is in continuation of our work on Chlorococcales¹. *Asterococcus*, a Volvocalean genus (Culture Collection of Algae, Bloomington), has been subjected to high altitude cosmic radiation for the first time in four different flights. The first exposure at altitudes of 37410 and

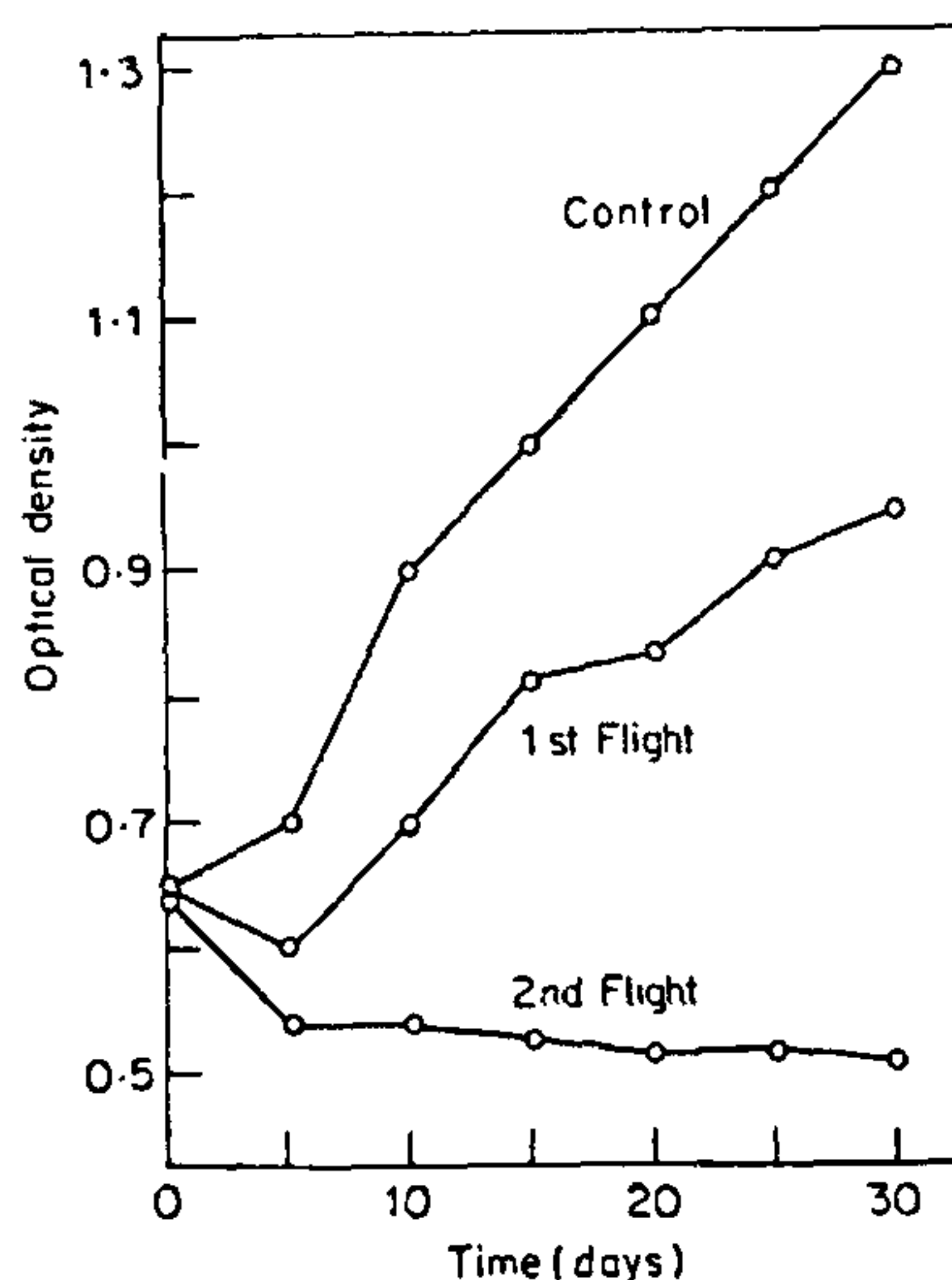


Figure 1. Growth pattern of *Asterococcus* after cosmic irradiation at 37140 and 36600 m altitudes.

36582.9 m for 9 and 6 h respectively did not result in lethal impacts on the cultures. However, damaging effects were quite evident on chloroplasts which turned into fragments and granules. Growth, monitored by optical density measurement, was also retarded (figure 1). The second exposure for 7 and 5 h, at altitudes of 36600 and 35564 m respectively proved lethal to the alga.

One of the pronounced effects of irradiation was enlargement of cell dimensions (figure 2B,C). This may be attributed to delayed cell division and defective metabolic processes. The formation of large vacuoles (figure 2C) may be an effort on the part of the cell to cope up with the expanded cell walls. Another significant consequence of cosmic irradiation was the disintegration of colonies (figure 2D) accompanied by irregularity in cell shape and cell size.

Volvocalean genera, such as desmids², were shown to be quite sensitive to high altitude cosmic radiation compared to Chlorococcalean genera¹. The present study further supports the view that Chlorococcalean algae with their high resistance to cosmic radiation are best suited for the support of life of man in space.

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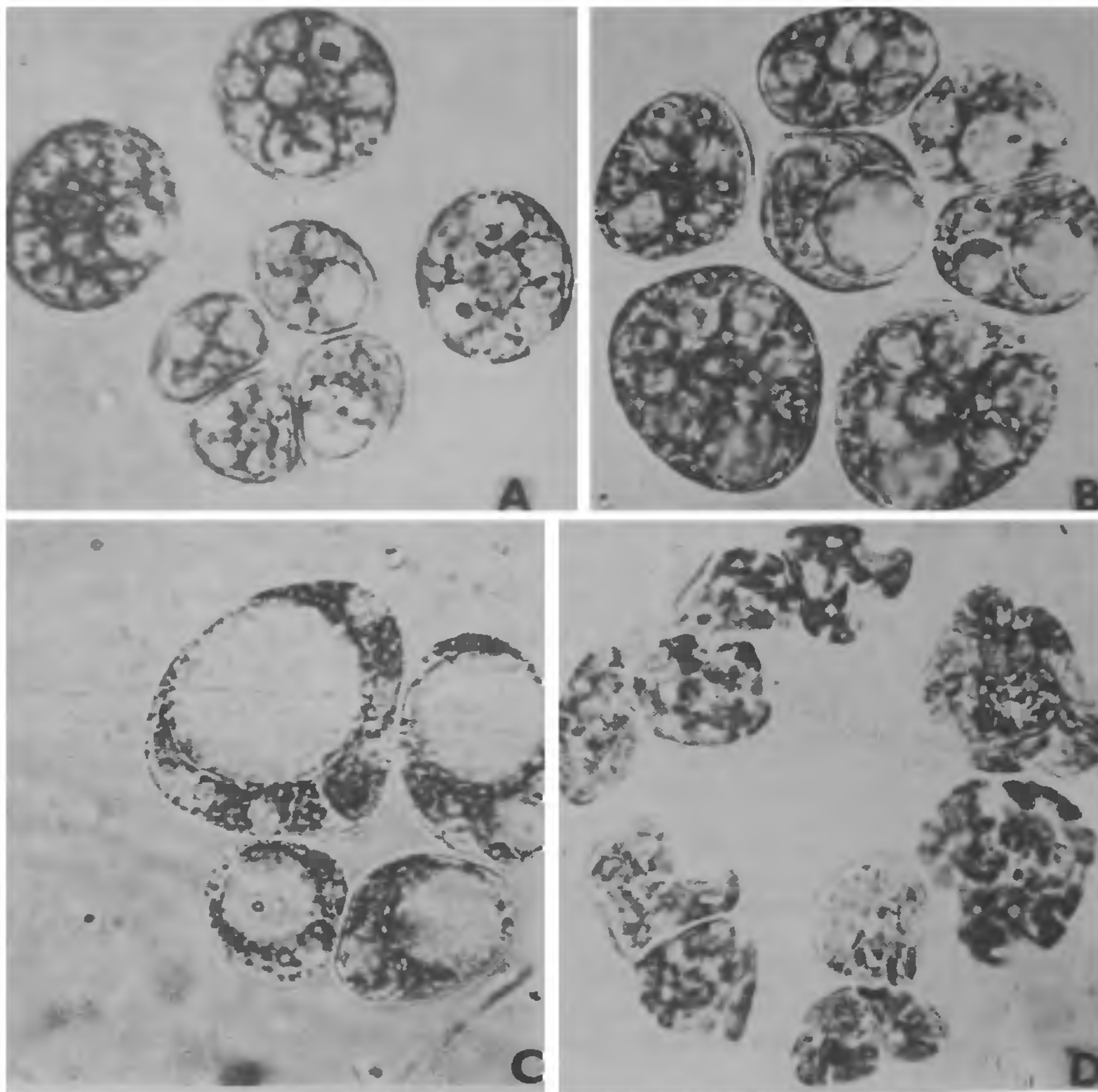


Figure 2A–D. Effect of high altitude cosmic rays on *Asterococcus*. **A.** Solitary cells and a colony of *Asterococcus* ($\times 1800$); **B.** Large and various-sized cells ($\times 1200$) (I exposure); **C.** Abnormal cells with large vacuoles ($\times 1200$) (II exposure), and **D.** Distorted cells with fragmented and granular chloroplasts ($\times 1200$) (II exposure).

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EPIDEMIC OF SUGARCANE WILT ASSOCIATED WITH PLANT PARASITIC NEMATODES IN SOUTH GUJARAT

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SUGARCANE (*Saccharum officinarum* L.) is an important cash crop extensively grown in South