blood suggest that it accumulates and acts as a storage organ for copper.

The histochemical studies on the hepatopancreas of the Crustaceans revealed that the copper is stored in the form of pseudocrystals distributed all over the gland in an irregular fashion[5]. Whereas in C. *ligulata*, its pattern of distribution is uniform throughout the hepatopancreas (figures 1, 2). The concentration of copper granules in the hepatopancreas of aestivated snails is less than the active snails (figure 2) suggesting its mobilisation into the blood for the synthesis of haemocyanin. The physiological significance of the augmented synthesis of haemocyanin during aestivation such as the storage of oxygen and higher oxygen affinity has been shown in an earlier investigation[1].

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EUDORINA PLUSICOCCA G. M. SMITH— A NEW RECORD FOR INDIA

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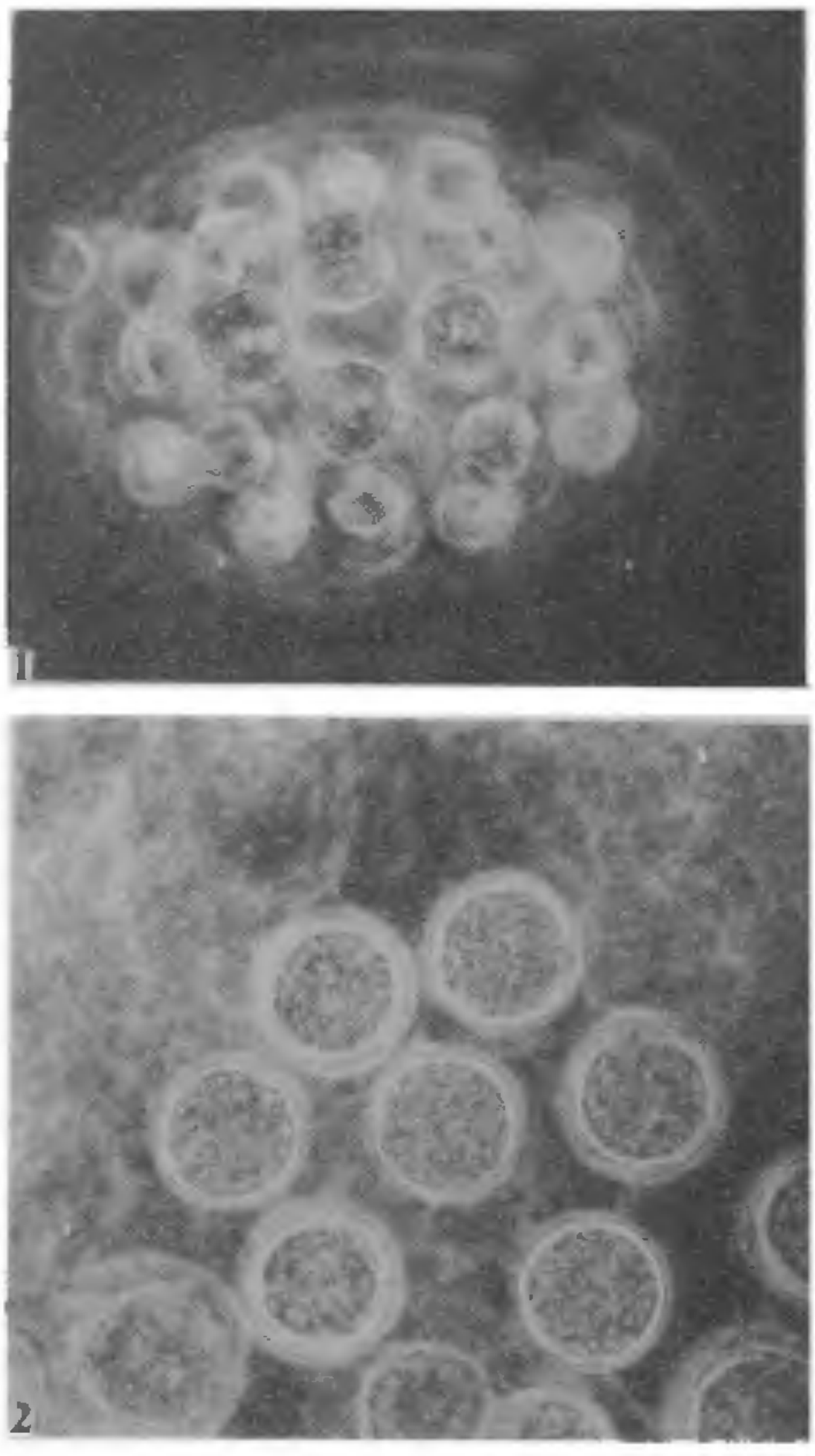
FIVE species of *Eudorina* Ehr. *viz. E. elegans* Ehr., *E. indica* Iyengar, *E. illinoisensis* (Kofoid) Pascher, *E. charkowiensis* (Kors.) Pascher and *E. carteri* Smith are reported so far from India[2]. During the study of Volvocales of Gujarat, the authors collected *E. plusicocca* G. M. Smith from road-side ditches. The entire collection showed aplanospore formation in the colonies.

Systematic account:

Eudorina plusicocca G. M. Smith (figures 1 & 2)

Colony ellipsoidal, 84–100 μm long and 67–86.5 μm broad, with double layered gelatinous envelope; 32-celled with cells in distinct tiers of 4, 8, 8, 8 and 4 cells in each; all cells equal in size, spherical or sub-spherical, 14.8–15.6 μm in diameter; chloroplast cup shaped with



Figures 1 & 2. *Eudorina plusicocca* G. M. Smith. 1. Showing the nature of colony, 2. Part of the colony showing aplanospores (× 642)

5–7 pyrenoids arranged regularly near the periphery. Asexual reproduction by means of thick-walled aplanospores; aplanospores spherical, smooth-walled, 23–24 μm in diameter; wall consisting of two distinct layers, outer wall not so dense as compared to the inner one. Habitat: Road-side ditches, Ratanpur; July, 1983 (C. No. V-32).

It differs from its nearest related species, *E. elegans* by having 5–7 pyrenoids regularly arranged near peripheral region of cell. Pyrenoids are sometimes more and the distribution is random as in *E. elegans*[2]. Aplanospore formation is reported only in *E. elegans*[1,2]. Aplanospores in the present species differ from those of *E. elegans* in having smooth walls while verucated or rough walls have been shown for those of *E. elegans*[1,2].

E. plusicocca G. M. Smith is a new record and aplanospore formation is reported for the first time in the species in India.

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INDUCED STERILE MUTANTS IN SOYBEANS

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SOYBEAN (*Glycine max* (L) Merrill) is a highly self-pollinated crop and the success in artificial crossing is extremely low. Moreover, the small size of flowers makes emasculation very difficult. Therefore, it is practically not possible to obtain a large number of hybrid seeds from the routine breeding program. This has restricted the soybean breeders to use only a limited number of breeding methods. Brim and Stuber[2] have suggested the utilization of male sterile stocks for soybean improvement program. This paper reports the frequency and inheritance of sterile mutants induced in cultivars, Bragg and Type-49 using gamma rays and EMS.

For each treatment 200 seeds of Bragg and Type-49 were used. They were treated with (i) 10, 15, 20, 25 and 30 krad of gamma rays, (ii) 0.1, 0.2, 0.3, 0.4, 0.5 and 0.6% ethylmethanesulphonate (EMS) for 12 hr and (iii) three double treatments of gamma rays and EMS, *viz* 10 krad gamma rays + 0.2% EMS, 10 krad gamma rays + 0.4% EMS and 15 krad gamma rays + 0.2% EMS. Treated seeds alongwith respective untreated controls were planted in single row plot in split plot design using three replications. At maturity, seeds of individual M_1 plants were harvested and kept separately for each treatment and variety. The individual M_2 progeny rows were planted and screened for male sterile mutants by observing pollen fertility using acetocarmine. In order to verify the genetic behaviour of male sterile mutants observed in the M_2 generation, individual plants of segregating progenies were harvested separately. The segregating M_3 progenies were scored for mutant and parent phenotypes. Pollen grain study of sterile plants was done in the M_3 progenies for confirming the male sterility.

Most of sterile mutants produced defective pollen grains which were less in number, variable in size and predominantly unstained with acetocarmine. Very few pods set on most of the male sterile plants, indicating female fertility. The total frequency of male sterile mutants in Bragg and Type-49 was approximately same (table 1). However, there were considerable differences among the different doses of gamma rays, EMS and their select combination with respect to the percentage of progenies segragating for male sterility. In Bragg, 15 krad gamma ray treatment produced the maximum number of male sterile mutants while in Type-49, 0.4 and 0.5% EMS treatments showed the maximum mutants (table 1). Interestingly, in Bragg, 0.4% EMS gave minimum mutations (5.00%) while in Type-49 the 0.2% EMS in combination with 10 krad or 15 krad of gamma rays exhibited lowest mutation frequency (6.66%), indicating differential response of both the genotypes to the different doses of gamma rays and EMS. The effects of gamma rays and EMS treatments were not found to be synergistic with respect to mutation frequency in the present study.