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POLLEN MORPHOLOGY OF AN *ERYTHRINA* HYBRID AND THEIR PARENTS

THE trophical genus *Erythrina* is characterised by dazzling red inflorescences, for which the plant is highly valued as an ornamental. While most species are arbrorscent, *E. resupinata,* a species from Terai forests, is of special importance for being an underground herbaceous perennial, with inflorescences arising directly from the root-stock. Several species of the genus have been brought into cultivation at the National Botanic Gardens, and an attempt has been made to cross the dwarf *E. resupinata* Roxb. (♀) with the tall *E. variegata* L. var. *orientalis* (L.) Merrill *forma parcelli* (Hort. ex Bull) Maheshwari (♂). The hybrid is shrubby in habit, but the characters of the flower show general dominance of the female parent[1].

Considering all the materials together, the pollen grains are three zonoporate and are with a reticulate exine surface[2]. The detailed data of pollen morphology (Fig. 1, A–C) of the two species and their hybrids are as follows:

E. resupinata.—3–(4)–zonoporate; pore diameter about 7 μ. Grain sizes: average 21 × 30 μ (Size classes E: 24 μ: 1%; 26 μ: 7%; 28 μ: 48%; 30 μ: 23%; 32 μ: 20%. 34 μ: 1%). Shape—oblate. Exine surface faintly reticulate; lumina smaller.

E. parcellii.—3–(4)–zonoporate; pore diameter about 6·6 μ. Grain sizs: average 32 × 39 μ. (Size classes E: 32 μ: 2%; 36 μ: 22%; 39 μ: 12%; 40 μ: 52%; 42 μ: 4%; 44 μ: 8%). Shape—oblate. Exine surface faintly reticulate; lumina larger, and with irregular muri.

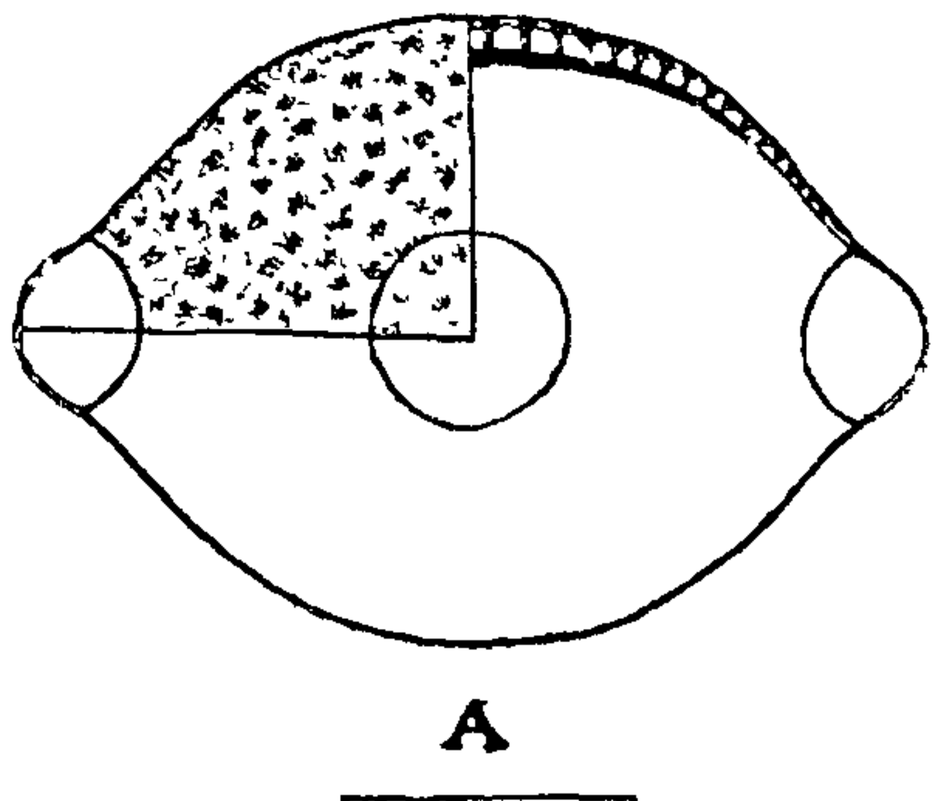

FIG. 1. A–C. Palynogram of *Erythrina.* A & B. *E. resupinata* (A. Equatorial view showing pore, general surface and strata; B. Reticulate ornamentation; note: brochi are small); C. *E. Variegata* (Reticulation; note: brochi large). Magnification: A × 1,500; B & C, × 3,000.

Hybrid.—Size classes: 28 μ: 14%; 30 μ: 25%; 32 μ: 52%; 34 μ: 19%; 39 μ: 17%.

The above data indicate that the dominant size class is 28 μ (range 24–34 μ), and the exine surface is provided with smaller brochi in *E. resupinata,* as against the higher average dominant size class of 40 μ (range 32–44 μ) and larger brochi on exine surface in *E. variegata.* In the hybrid, the dominant size class is 32 μ, and the exine surface is provided with smaller brochi as that in *E. resupinata,* and no grain of the *variegata* type has been observed to occur, which indicate the complete dominance of the characters of female pollen in the hybrid.

The present finding of the dominance of the female pollen type in the hybrid is contrary to the observations made by Hendersen[3] on *Meconopsis,* Olsson[4] on *Linaria,* Srivastava *et al.*[5] on *Amaranthus,* Srivastava[6] on *Corchorus,* and Srivastava[7] on *Tagetes,* in all of which the pollen in hybrid has been found to bear

characters of the male parent. The reflection of female dominance in the pollen of *Erythrina* is substantiated by both vegetative and floral characters, and it may be presumed that it is a case of maternal inheritance. In an elaborate study of the pollen morphology of *Erythrina*, Graham and Tomb[2] recorded the occurrence of the increased abortion and multiaperturate grains as a result of hybridation, although the present study does not provide sufficient evidence in that direction.

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REPORT OF TWO NATURAL ENEMIES OF *SPIRODELA POLYRHIZA* (L.) SCHLEID

THE menace of water weeds is reaching alarming proportions in specially tropical countries. Duckweeds are next important aquatic weeds after waterhyacinth. Amongst duckweeds, *Spirodela polyrhiza* (L.) Schleid is one of the most vigorously growing plant on the earth (National Academy of Sciences[1]). The chemical method cannot be adopted for its control because effective chemicals cause many harmful affects in aquatic ecosystem. No natural enemies of *S. polyrhiza* have been reported uptill now.

During the present study, two potent natural enemies, *viz.*, *Lymnaea luteola* f. *impura* (Troschel), a snail and *Bagous* sp., a coleoptral insect were found. They were found naturally in rare water-bodies of Gorakhpur. Both the enemies were found to show their maximum feeding capacity during January and February, which is also their maximum population period.

Lymnaea luteola f. *impura* (Troschel) is a snail of family Lymnaeidae, found in organically rich water-bodies. They were found to scrap the fleshy thallus of *S. polyrhiza*, causing permanent injury, which finally leads to distintegration of thallus very quickly. It was found that 50 starved individuals can cause death of 25 gm of *S. polyrhiza* in 7 days. *L. luteola* is also not known to serve as an intermediate host for any trematode causing diseases in human beings.

Bagous sp. is small semi-aquatic insect of family Curculionidae. The insect generally makes a small hole on the thallus of *S. polyrhiza*. Sometimes, the process is so frequent that they cause complete death of the plant. It was found that 100 individuals can cause 30% loss of fresh-weight in 7 days. The insect has been found most active during morning hours. Both the natural enemies were found to co-exist.

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PRODUCTION OF AMINO ACIDS IN *EPHEDRA FOLIATA* SUSPENSION CULTURES

THE role of amino acids in the biosynthesis of secondary plant products has been speculated[1-4]. There is little information regarding the quantitative estimation of amino acids from plant tissue cultures, although amino acids have been reported from *Datura stramonium*,[4] *D. metel*, *D. tatula*, *Momordica charantia*, *Trigonella foenum-graecum*,[5] *Ginkgo* species,[6] *Sesamum indicum*, *Tephrosia purpurea* and *T. vogelii*[7]. The present investigation deals with the production and estimation of amino acids in *Ephedra foliata* Boiss., suspension cultures.

Sterilized stem pieces of *E. foliata* were inoculated in 100 ml flasks containing 30 ml of revised[8] Murashige and Skoog's[9] medium (RT) supplemented with 1 ppm of 2, 4-dichlorophenoxyacetic acid (2, 4–4) and 1% agar. The tissue was grown and maintained for a period of twelve months as static cultures after frequent subculturings of 6–8 weeks in fresh RT medium. The static tissue was then transferred to RT liquid medium supplemented with 0·1 ppm of 2, 4–D. Suspension cultures were grown on rotary shaker for a period of five months. Three and six weeks old tissues were harvested separately and growth indices calculated (GI = Final fresh weight of tissue—Initial fresh weight of tissue/Initial fresh weight).

For the extraction of free amino acids the fresh tissue was homogenized in a Waring Blendor in 90% ethanol (1 gm/5 ml). Each of the homogenized tissue was separately centrifuged for 30 min and the residue washed three times with 90% ethanol. The