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Short Communication

Induction of male sterility in winged bean [*Psophocarpus tetragonolobus* (L.) DC.]

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Utilization of male sterility in exploitation of hybrid vigour and population breeding has been helpful in achieving substantial yield gain in many crop plants. Hence, isolation of male sterile line is of prime importance in breeding programme. Occurrence of natural male sterile mutants is rare and if available these may be deficient in desirable character/s. This has necessitated the artificial induction of male sterility by mutation or by use of selective gemetocidal compounds.

Male sterility has not been reported so far in winged bean [*Psophocarpus tertagonolobus* (L.) DC.] a promising protein rich legume crop. Eriskine [1] emphasized the need of male sterility in winged bean and concluded that the exploitation of heterosis will not be feasible until methods facilitating cross-pollination such as male sterility are available. Present communication reports male sterility in winged bean for the first time.

"Philippine" an accession of winged bean was treated with Co^{60} source (5 to 40 kR) at B.A.R.C. Mumbai in 1994. Out of the 29 M_4 families derived from seed treatment one family in M_4 generation segregated for male sterility. In this family out of 6 plants four were normal fertile and two were male sterile. Both fertile and sterile mutant plants appeared completely normal until onset of the reproductive stage. The differences in them appeared at flowering (Fig. 1) and become quite pronounced there after (Fig. 2).

Male sterile plants had dark green thick leathery leaves most of which were retained at maturity and

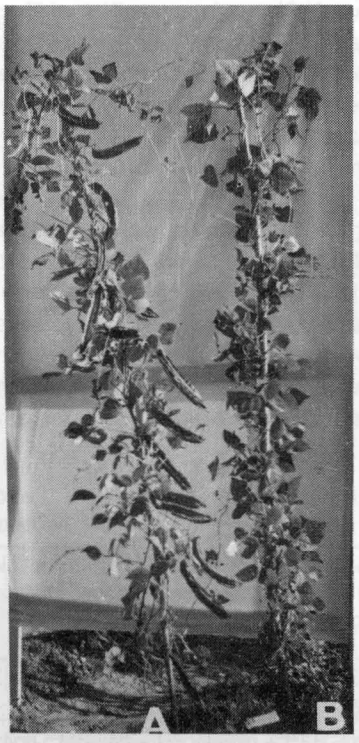

Fig. 1. Normal fertile (A) and male sterile (B) plant

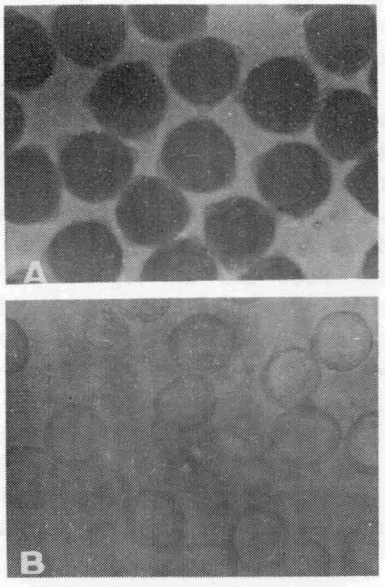

Fig. 2. Pollen grains from fertile (A) and male sterile (B) plant

were slow in senescence. Flower drop was observed 2 to 3 days after flowering with no pod setting. The anther showed dehiscence but not pollen shedding. To test pollen fertility, matured anthers were squashed in differential stain [2] and in acetocarmine. It was found that almost all pollen grains were sterile (96% pollen unstained). Pod setting was not observed on open pollination of the sterile plants. When pollination was done with "Philippine" and "Nigerian W" accessions of winged bean, pod setting occurred. It could, therefore, be inferred that these plants are male sterile. Further genetic studies to determine sterility type and cytogenetics of it are in progress.

References

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