

Discrimination of three sex morphotypes in *Plantago Ovata* Forsk.(Plantaginaceae) through floral characters

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Floral biology studies which were conducted for four characters (anther colour, anther size, anther length and style length) resulted in finding out the significant differences among sex-morphotypes (male fertile, partial male sterile and male sterile) of different lines. The differences were recorded in anther size and shape of anther. Anther length varied from 0.76 to 1.81 mm in three sex morphotypes. Breadth of anther varied from 1.19 to 1.73 mm. Size of seed varied from 2.43 to 2.73 mm in three sex morphotypes of different germplasm lines. Mean of style length was 5.12, 7.12 and 8.14 mm in fertile, partial male sterile and male sterile type respectively. It could be concluded that floral biological observation could be successfully utilized to characterize male sterility in *P. ovata* (Isabgol).

Key words : Cytoplasmic male sterility (CMS), *P. ovata*, Sex-morphotype

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INTRODUCTION

Plantago ovata Forsk. commonly known as “Isabgol” belongs to family *plantaginaceae*. It is a native of Mediterranean region and is cultivated for its valuable husk used as medicine. Isabgol is one of the most important medicinal crops of Gujarat. However, so far only two varieties viz., Gujarat Isabgol-1 Gujarat Isabgol-2 and Gujarat Isabgol-3 have been released for general cultivation in the state. Though the productivity has been increased from 604 to 672 kg/ha after release of Gujarat Isabgol-2, the amount of increase is very meagre due to its less adaptability to varying environmental conditions. Therefore, looking at the importance of Isabgol crop in the state, there is urgent need to enhance productivity and production to make the crop more profitable.

Cytoplasmic male sterility (CMS) is a common phenomenon among *plantago ovata* (Pillai *et al.*, 1997) and has received much attention due to its potential use in heterosis breeding and hybrid seed production. It's characterized by the failure of the plant to produce viable or functional pollen. In gynodioecious (Van *et al.*, 1982) (*Plantago ovata* Forsk.) populations, the male sterile

plants vary from 2 to 50 % (Lewis, 1942). Paliwal and Hyde (1959) reported that male sterility in *Plantago cornopus* was due to the presence of B-chromosomes. Atal (1958) reported that male sterility in *P. ovata* was of cytoplasmic type Atal (1958). He further reported that sterile plants could be readily distinguished from the normal plants by floral characters viz; shriveled appearance of their anthers as compared to the membranous, well developed anther of normal plants, Ross (1969). Floral biology has been extensively used in plants to discriminate the three sex morphotypes (Jamwal, *et al.*, 1998) and identify male sterile line. Keeping in view the above aspects the present study was planned to be carried out comparative floral biology of three sex-morphotypes viz., fully fertile, partial sterile and fully sterile plants in *Plantago ovata* Forsk.

RESEARCH METHODOLOGY

The present investigation Discrimination of three sex morphotypes in *Plantago Ovata* Forsk.(Plantaginaceae) through floral characters was undertaken in the Department of Agricultural Botany and Biotechnology, B.A. College of Agriculture, Anand Agricultural