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Research Note

DPO 14 - An early maturating mutant of Isabgol (*Plantago ovata* Forsk)

P. Manivel* and R. Saravanan

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Abstract:

DOP-14 is an early maturing mutant of Isabgol. It has early maturing with desirable traits such as high seed yield, early & uniform seed maturation and high harvest index. It can be an important source for developing early maturing high yielding Isabgol varieties with desirable quality.

Key words:
Isabgol, seed yield, mutant.

Isabgol (*Plantago ovata L* Forsk.) is an important medicinal plant mainly used as laxative world wide. India is the sole exporter of this crop to the world market. Isabgol husk, the seed epidermis having muco-polysaccharide layers, is widely used against constipation, diarrhoea and intestinal irritation. Isabgol is also an excellent source of dietary fiber and has hypocholaesterolemic activity (Kawatra *et al.,* 1990) and is widely accepted as food additive in several processed materials like cookies, ice-cream, bread, etc. (Trautwein *et al.,* 2000). This crop is mainly cultivated in arid and semi-arid regions of Gujarat, Rajasthan and parts of Madhya Pradesh as rain-fed *Rabi* crop where intermittent drought limits Isabgol production. In general the crop matures at 110-120 days after sowing (DAS) and requires supplementary irrigation to increase the seed yield (Maiti and Mandal, 2000). Isabgol, generally flowers at about 60 DAS and seed maturation takes 7-8 weeks after flowering. This report describes the identification of DOP-14, an early maturing Isabgol mutant with desirable traits such as high seed yield, early & uniform seed maturation and high harvest index. Single plant with earliness (80 DAS) was identified and isolated in M_2 generation of 0.4% DES treated Isabgol cultivar GI-2. It was self pollinated and advanced to next generation. In M_3 generation, the mutant bred true and all the plants showed the early maturity. DOP-14 mutant started flowering at 34 DAS (Fig 1) and seed matured at 85 DAS (Fig 2) at DMAPR, Anand, Gujarat which is 35 days early compared to its parent GI-2 (120 DAS). Its average plant height was 37.5cm with an effective inflorescence length of 7.0-8.0 cm (Fig 3). The seed weight was 2.3 g plant^{-1} with a total biomass yield of 9.9 g plant^{-1}. The harvest index was 22.8% which was 31% higher than parent GI-2.

The mutant DOP-14 will be useful line as it may escape post flowering drought which coincides with raising diurnal temperature and high light and evapo-transpiration load besides escaping from the serious Downey mildew disease. Further, DOP-14 mutant can be an important source for developing early maturing high yielding Isabgol varieties with desirable quality.

Directorate of Medicinal and Aromatic Plants Research(ICAR), Anand, Gujarat- 387 310
*Email: manivelp@yahoo.com

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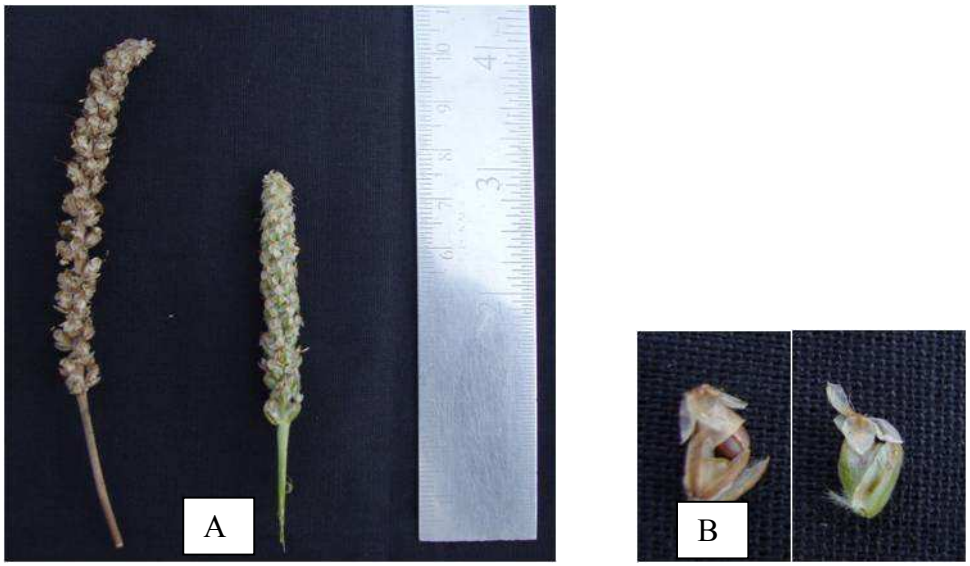
Fig. 1: DPO 14: flower initiation (34 to 38 days after planting) (right) and GI 2 (Control -Left)

DPO 14 GI-2

Fig 2. DPO 14 at maturity (80-85 days after sowing) with GI-2



DPO 14 GI-2 DPO 14 GI-2

Fig.3. (A) Inflorescence and (B) Single spikelet of DPO 14 (Mutant) and GI -2 at 85 days after sowing