Indian J. Genet., **61**(4): 366 (2001)

Short Communication

Crossing technique without emasculation in chickpea

Narendra Singh

Indian Institute of Pulses Research, Kanpur 208 024

(Received: October 2000; Accepted: October 2001)

Emasculation in chickpea is tedious due to the small size of its flowers. In addition, any slight injury to the style or stigma during emasculation results in the flowers being shed. As natural seed setting is quite low in chickpea, the success of seed setting in artificial crossing is further reduced by slight injuries during emasculation.

The present study was undertaken to investigate the possibility of artificially crossing chickpea without removing the anthers, based on the fact that the stigma dehisec becomes receptive before anthers. Two varieties with contrasting flower colours L 550 (white flowers) and K 850 (Pink flowers) were used. In chickpea, the control of flower colour is monogenic with pink being dominant over white. Therefore flower colour was used as a 'Marker' to find out the extent of self pollination in crosses affected without emasculation. L 550 was used as the female and K 850 as the male. Buds of proper size with intact anthers and the stigma in the receptive stage were chosen and carefully pollinated to avoid injury to intact anthers.

In the F_1 generation plants were observed for their flower colour. Fourteen per cent of the F_1 plants were having white flowers which meant that 14 per cent of the flowers were self pollinated during hybridization. This self pollination can be attributed to the competition between the pollen of female with the pollen applied from the male plant.

The present study suggests that when hybridization without emasculation is attempted, there is always some chance of self- pollination. Therefore, this technique should only be used when parents are chosen on the basis of marker genes which can be used to eliminate self pollinated progenies in the F_1 generation. In chickpea, sufficient information is available on inheritance of various traits [1-3]. Therefore, monogenic traits with complete or incomplete dominance can be used as 'markers' to identify selfs. The reduced damage to flowers and the reduced time taken when flowers are not emasculated while making crosses can result in more flowers setting seed for the same amount of effort even when some selfed plants are discambled.

References

1. **Dahiya B. S.** 1974. Crossing without emasculation in chickpea. Indian J. Genet., **34**: 206-207.

2. **Retig G.** 1971. 1.Hybridization method in chickpea (*Cicer arietinum* L.). 2. Crossing without emasculation. Israel J. Agric. Res., **21-3**: 113.

3. **Ramanantha Ayyar V and Bala Subrahmanyam R.** 1935. Anthesis and pollination in Bengal Gram (*Cicer arietinum* L.) Madras Agric. J., **23-5**: 170-178.