

Pollen production of selected *Gossypium* varieties (Malvaceae) aureus

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Abstract

Total pollen production per inflorescence was studied in the eight selected *Gossypium* varieties viz., NHH-44, Ankur-651, AKH-081, Renuka-143, H-10, PKV-hy-2, H-8 and Ajeet 11. In *Gossypium* varieties studied the number of anther per flower was found to be in range of 70 to 108 anther per flower. The production of seed usually depends on the production of pollen grain although a plants total production of pollen grain is influence by various factors and also varies from year to year. Maximum pollen production was estimated in Pkv-hy2 (419780 ± 71527) during the study period. However it was minimum in H-10 (188284 ± 66980). Thus pollen production was more or less high in all varieties, which favours the successful seeds in all varieties reflecting the male reproductive success.

Keywords: pollen production, pollen, cotton varieties, *Gossypium*

1. Introduction

Flower production significantly influences the pollen production. Pollen production is to be determined primarily on a per flower basis. High pollen production may favours increase in male reproductive success of the plant (Vonhof and Harder, 1995) [15]. Therefore, increased pollen production might be in terms of number of grains per anther.

Although, plants are generally known to produce a large amount of pollen, there may be some variation in pollen production per flower. The available literature about the pollen production is known to vary within and amongst plant in a given population, due to environmental conditions (Willson and Burley, 1983; Stanton and Preston, 1986; Young and Stanton, 1990a, 1990b and Lau and Stephenson, 1993) [17, 13, 18, 19, 7]. Such studies provide complete information about pollen production, which is of vital importance to the plant breeder.

2. Materials Methods

Before starting the pollen production assay the time of daily anthesis and anther dehiscence in different cotton varieties was noted. To determine pollen productivity undehisced anthers from the flower buds were collected and pollen

productivity was done as per the method of Nair and Rastogi (1963) [7].

The undehisced anthers were crushed in 50% glycerin in a graduated test tube of 10 ml. The plastic dropper was standardized and the pollen per drop were counted by adding one drop of suspension on to a slide and covered by a cover glass. From this, the mean pollen production per flower was calculated.

Number of pollen grains/anther/flower was determined from the 10 flowers distributed over different plants of the same variety.

3. Results

The pollen production data was collected from selected varieties of *Gossypium*

In cotton varieties studied the number of anthers per flower was found to be in the range of 70 to 108 anthers per flower. Pollen production per flower was found to be 317918 ± 53899 in NHH-44, 277140 ± 48124 in Ankur-651, 206787 ± 31487 in AKH-081, 298628 ± 120704 in Renuka-143, 188284 ± 66980 in H-10, 419780 ± 71527 in PKV-hy-2, 337192 ± 94444 in H-8 and 243382 ± 76953 in Ajeet-11.

Table 1

S. No.	Cotton varieties	Mean No. of p.g. per flower	SD	SE	Range	Total Pollen production
1	NHH-44.	317918	53899	17044	226446	379610
2	Ankur – 651.	277140	48124	15218	202048	358996
3	AKH-081	206787	31487	9957	168300	280500
4	Renuka – 143.	298628	120704	38170	180774	546920
5	H – 10	188284	66980	21181	123398	349338
6	PKV-hy 2.	419780	71527	22619	315700	535546
7	H – 8.	337192	94444	29866	238876	524744
8	Ajeet – 11.	243382	76953	24335	105336	382536

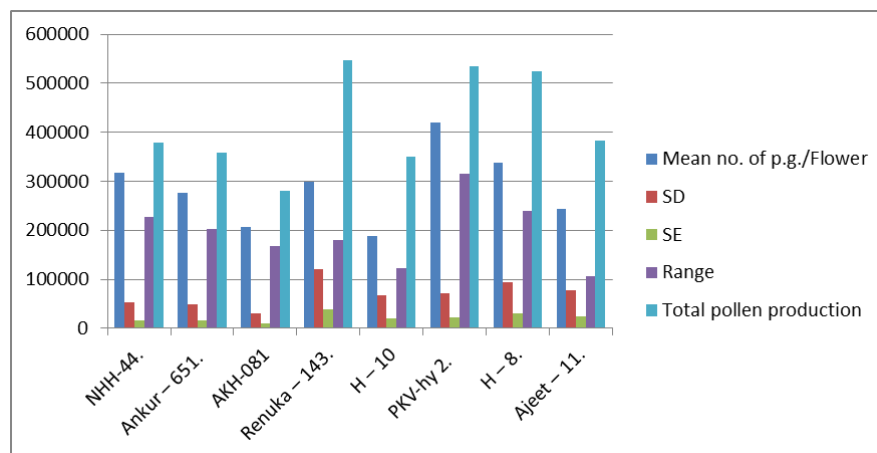


Fig 1

4. Discussion

The production of seed usually depends on the production of pollen (Faegri and Iversen, 1989) [3]. Although a plant's total production of pollen grains is influenced by various factors (Stanley and Linskens, 1974) [12] and also varies from year to year (Rogers, 1993) [9] it is often important for commercially valuable plant to have an estimate of the total production of the pollen per plant. Khanduri and Sharma (2002) [6] discussed and concluded that the quantity of pollen produced by an individual plant, and by the plant community, is not constant but varies, both specifically and individually in relation to ecological parameters, especially with climatic changes. Pollen production per species are affected by size-class, vigour, climate and site and meteorological phenomenon such as warmth, dryness and sunshine during formation of flower primordial on the previous year, favorable or unfavorable precipitation during the vegetative growing season, sunshine prior to pollination, wind direction velocity and turbulence have been recognized and reviewed by Erdtman (1943a) [1], Hansen (1949), and Faegri and Iversen (1950).

During the present studies eight varieties of cotton showed variation in total pollen production during the season. The pollen production per flower in NHH-44 was found to be 317918 ± 53899 , in Ankur- 651 it was 277140 ± 48124 , in AKH-081 it was 206787 ± 31487 , in Renuka- 143 it was 298628 ± 120704 , in H-10; 188284 ± 66980 , in PKV-hy-2; 419780 ± 71527 , in H-8; 337192 ± 94444 , in Ajeet-11; 243382 ± 76953 . Maximum pollen production was estimated in PKV-hy-2 (419780 ± 71527) during the study period. However it was minimum in H-10 (188284 ± 66980). Thus pollen production was more or less high in all varieties, which favors the successful seed siring in all varieties reflecting the male reproductive success. Vonhof and Harder (1995) [15] supported that high pollen production may favor increase in male reproductive success.

Sihag and Priti (1997) [10] also stated that pollen production is influence by several factors, such as soil, moisture, crop density nutrient availability, flowering frequency, temperature and relative humidity. Furthermore, Smart *et al* (1979) [1] explained that variation in pollen production by an individual plant might be genetically fixed at the same time. Subba Reddi and Reddi (1986) [14] also supported that the levels of pollen production in a particular species is a function of its genotype. Smart *et al* (1979) [11] showed that

such variation could be related to the mode of reproduction. The variation amongst cultivated species differ from one another in their pollen production (Joppa *et al*, 1968) [5] however, from the present data it is observed that even the varieties of same species differ in their pollen production.

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6. Reference

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