

SOME MORPHOLOGICAL AND BIOCHEMICAL STUDIES OF PLANT PARTS OF *VICIA FABA*.

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Abstract: The Pollen morphology is of great significance particular in cultivar taxonomy. Man has been always interested to find out micro organisms, pollen grains and fungal spore in air for better air quality. From time to time many workers as Vishnu Mittra & Gupta (1966) worked on pollen morphology. Nair & Sharma (1962) also studied on pollen morphology and pollen analysis of certain economically important families of angiosperms such as Liliaceae, Fabaceae. Sateesh and Nair (1993) also carried study of pollen grains at Tirachira pali (T.N.) in atmosphere. It was of interest to carry some work on morphological and bio-chemical studies on selected cultivars crops near college field. The studies with pollen morphology show that size of pollen grain increases under acetolysed as compared to non acetolysed condition. Similar decline in nitrogen content was observed more in infected plant soil as compared with healthy plant soil.

Keywords: Biochemical, Pollen morphology

INTRODUCTION

From time to time many workers Vishnu Mittra & Gupta (1966) worked on pollen morphology. Nair (1963) did several studies on pollen morphology and pollen analysis of certain socio-economical important families of angiosperms such as Liliaceae (1965), Fabaceae (Nair & Sharma, 1962). Singh et.al (1994) worked on air borne fungi in the hospitals of metropolitan like Delhi. Similarly, Mandal et. al (1988) worked on aero-biology of Shanti Niketan, West Bengal. Sathes & Nair (1993) also carried study on pollen grains at Tirachira pali in atmosphere.

MATERIAL AND METHOD

Anther and Pollen grains of experimental plants collected on glycerin jelly coated micro slides exposed during flowering session on the roof of

college field of games room and side by side similar jelly coated slide were kept in the wooden trap under field condition . Pollen grains were identified with the help of reference slides. Anther and Pollen grains were also collected from mature healthy and diseased plants grown in the field areas of the college field. These slides and material were used for the experimental work. For morphological studies Acetolysis method proposed by Erdtman (1952) and modified by Nair (1960) was followed.

Plant sample for biochemical analysis were taken on 0, 40th, 80th day of seedling appearance, based on crops. Stem, leaf, anther & pollen grains were collected. Dry weight & dry samples of experimental plants were used for qualitative estimation of total nitrogen uptake. For estimation of nitrogen the digestion was done according to Snell & Snell (1954) & later nitrogen in the digest was estimated calorimetrically.

Observations

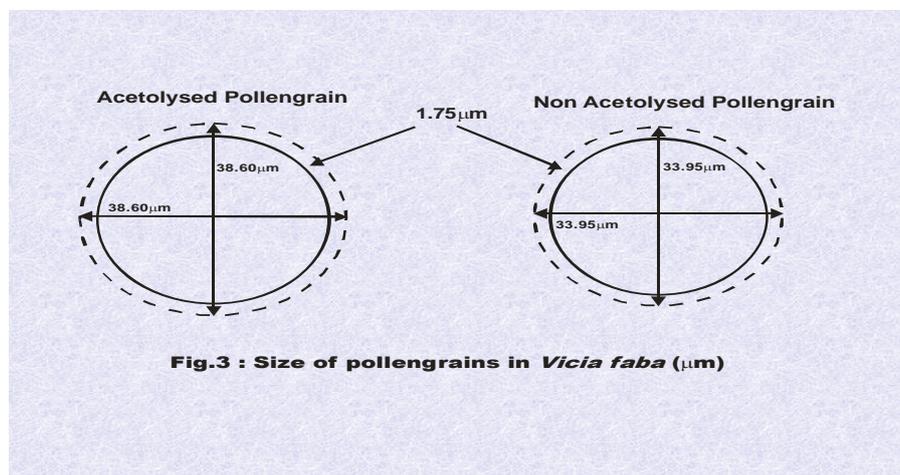


Fig.3 : Size of pollengrains in *Vicia faba* (μm)

Table 1.

Size of Pollen grains			Morphological features of Pollen grains		
Species	Acetolysed diameter (µm)	Non-Acetolysed diameter(µm)	Pore diameter (µm)	Annulus diameter (µm)	Exine Thickness diameter (µm)
<i>Vicia faba</i>	38.60 ±3.15	33.95 ±2.86	4.80 ±0.30	1.75 ±0.49	1.75 s±0.49

Table 2. Total Nitrogen (per gram dry weight) uptake & distribution in healthy and infected plant parts of *Vicia faba*.**Plants without infection**

S.No.	Days from emergence	Soil without plant (Blank)mg/kg	Soil with plant mg/kg	Total nitrogen level in stem(mg/g m dw)	Total Nitrogen level in Leaf(mg/g m dw)	Total nitrogen level in Anther(mg/g m dw)	Total nitrogen level in pollen grain(mg/gm dw)
1	0	550.0	550.0	-	-	-	-
2	40	540.0		12.00	16.50	-	-
3	80	520.0	580.0	523.80	14.50	16.50	15.00

Plants with infection

S.No.	Days from emergence	Soil without plant (Blank)mg/kg	Soil with plant Mg/kg	Total Nitrogen level in stem(mg/gm dw)	Total Nitrogen level in Leaf(mg/gm dw)	Total Nitrogen level in Anther(mg/g m dw)	Total Nitrogen level in pollen grain (mg/gm dw).
1	0	550.00	550.0	-	-	-	-
2	40	536.0	552.0	7.53	10.50	-	-

RESULTS AND DISCUSSION

Observations indicate that non-acetolysis pollen grains of *Vicia faba* shows reduction in size of pollen grains by Ca as 13% compared to acetolysis pollen grains of *Vicia faba*. Result shows the pore diameter, annulus diameter & exine thickness in *Vicia faba*. The study with pollen morphology shows that size of pollen grain of *Vicia faba* increases under acetolysed as compared to non acetolysed condition. The results are in agreement with the results of Sampat & Ramanathan (1957), Sheeba & Vijayvalli (1998), Rawat et. al. (2003) and Bokalia and Borah (2004). Results shows that the nitrogen uptake and its distribution in healthy and infected plant parts at 40th and 80th days in *Vicia faba* decrease in total nitrogen content in infected plant parts. Results also show that there is a general inhibition of total nitrogen content in most of the plant parts in presence of infection. Table also indicates that total nitrogen content on gram dry weight basis is not much affected in this plant. However there is some decrease in the total nitrogen content on gram dry weight basis in infected plant parts. Thus total nitrogen content in infected leaf at 40th and 80th days are 63.6 % & 82.7 % as compared to healthy leaves. This result shows some recovery of total

nitrogen of infection. Likewise total nitrogen content of infected plant in anther & pollen grains are 83.9 % and 73.4 % as compared to healthy plant anther and pollen grains respectively. Results also shows that in case of blank soil, the total nitrogen content / kg soil decline from 0 and 80th days in soil of crop fields. Results also indicate that among the blank soil there is slightly more nitrogen content loss then the soil with plant. However, in soil with plant, Total nitrogen content/kg soil also declines from 0 and 80 days in both, healthy and infected plant soil. However, this decline is more in infected plant soil with plant.

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