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Estimation of pollen fertility and pollen size in two varieties of *Urginea indica* Kunth. collected from Ranchi, Jharkhand

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Abstract: *Urginea indica* Kunth. (Liliaceae) is a medicinal plant with considerable morphological variations. Two varieties of *Urginea indica* Kunth. collected from Ranchi, Jharkhand has been studied for percentage pollen fertility and for size and shape of pollen grains. High pollen fertility in both the varieties shows their general stability. The size of pollen grains is important traits that may be the factors in reproductive behavior for the two varieties directly affecting the genetic flow for each variety.

Key words:*Urginea indica* Kunth., pollen fertility.

INTRODUCTION

Urginea indica Kunth. belongs to the family Liliaceae, and is reported to have a wide range of medicinal utilities. There are considerable morphological variations within the species, leading to evolutionary divergence of population of *Urginea indica* Kunth. They differ in both vegetative and floral morphology[1].

Pollens are the most important and variable characters, valuable for identification of species composition of ancient ecosystems and hence for discovery of the climate and other variables.

Pollen is living and like any living organisms its behavior and survival are influenced by both environment and genotype. Pollen grains have an important part in the modern issue of plant taxonomy[2]. Pollen and anther characters have frequently been regarded as systematically significant in monocotyledonous both above and below the family levels[3].

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Pollen fertility studies have been helpful for the recognized wide range of variations existing within the species and differentiating plant species with genera[4]. It is possible to assert that the capacity for pollen production and size of the pollen grains produced are important traits that may be factors in the reproductive behavior for the different varieties, directly affecting the genetic flow for each variety.[5]

Two varieties of *Urginea indica* Kunth. collected from Ranchi, Jharkhand, were taken for the present work. These two varieties of *Urginea indica* not only shown morphological variations, their flowering and blooming time also varied. The first , variety 1 was composed of pinkish orange flowers blooming in the month of April and May, while the variety 2 was composed of comparatively small whitish flowers, blooming in the month of September and October.

Therefore, the objective of the present work was to characterize the pollen fertility, pollen size and pollen shape of the two varieties.

MATERIALS AND METHODS:

Two varieties of *Urginea indica* Kunth. were collected from Ranchi, Jharkhand. They were distinguished on the basis of color of flower as:

(1) *Urginea indica* Kunth. pinkish orange Flower variety V1

(2) *Urginea indica* Kunth. White Flower variety V2

To analyze pollen fertility, pollen grains from fresh open flowers of both the varieties of Urginea indica were dusted on the microscopic slide, and stained with 2% acetocarmine. Stained pollen grains were considered to be fertile and unstained ones as sterile. Pollen fertility percentage was determined by the formulae:

$$\text{Total number of fertile pollens= Percentage pollen fertility} = \frac{\text{Number of pollens studied}}{\text{X 100}}$$

The length and width of the pollen grains were measured with ocular and stage micrometer, and microphotographs were taken.

RESULT AND DISCUSSION:

In the present study, two varieties of *Urginea indica* were investigated for the percentage pollen fertility and pollen grain diameter as shown in Table 1 and fig.1.

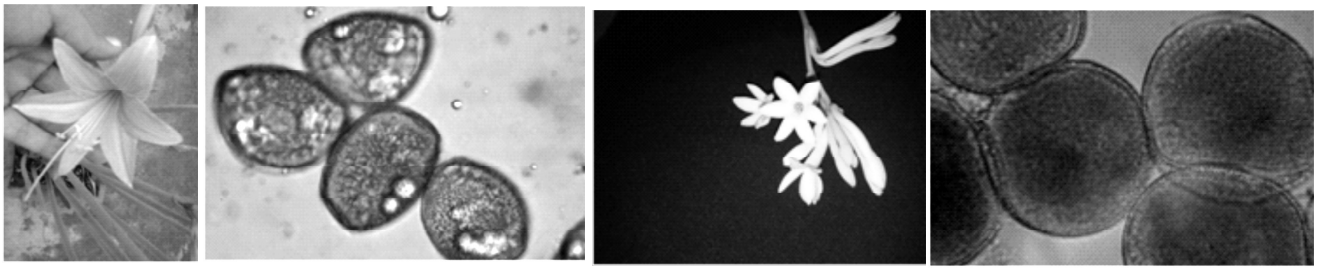
In this investigation few differences were noticed between the pollen grains of two varieties *of Urginea indica.* Pollen grains *of* pinkish orange flower variety of *Urginea indica (V1) were* monosulcate and oblate. They were 32.4±2.653 long and 25.00±2.720 wide. The pollen fertility recorded for this variety was 85 percent. Whereas, the pollen grains of white variety of Urginea indica (V2), were monosulcate, spherical 35.8±2.039 long and 34.9±1.640 wide. The pollen fertility status in this variety was 77 percent.

In both the varieties of *Urginea indica*, under investigation, pollen fertility observed was very high and there was no seed setting. This high fertility percentage shows the stability of the two floras, as pollen fertility is supportive to conclude the level of fertility and stability in vegetation developed under adverse circumstances.[6]

Table 1: Percentage of pollen fertility, length and width of pollen grains in two varieties of U*rginea indica* kunth.

Varieties under consider ation	Total number of pollen grains observed	Number of fertile pollen grains	Number of sterile pollen grains	Pollen fertility percentage (%)	Length of pollen grains (µ)	Width of Pollen Grains (µ)
V1	780	663	117	85.00	32.4±2.653	25.00±2.720
V2	813	629	184	77.36	35.8±2.039	34.9±1.640

V1: Brown variety of *Urginea indica*
V2: White variety of *Urginea indica*



a b c d

Fig.1: Photographs showing the flowers and pollen grains of two varieties of *Urginea indica* Kunth.
1(a-b): Flower and pollen grains of *Urginea indica Kunth.* pinkish orange variety (V1).
1(c-d): Flowers and pollen grains of *Urginea indica Kunth.* white variety (V2).

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