

STUDY OF POLLEN MORPHOLOGY IN GENUS *ALYSICARPUS* DESV

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ABSTRACT

A comparative study of pollen morphology (shape, size, colpi length, margin, pore structure, exine surface etc.) amongst 19 species of *Alysicarpus* were studied. It is a tiny genus in the family Fabaceae enumerated. Pollen in the genus showed higher homogeneity but are triangular or oval or spherical in shape. It was observed that heterogeneity in their sizes more conspicuous varies between 21.98 μ (*A. luteovexillatus*) to 50.24 μ (*A. ovalifolius*). In these present investigation 19 taxa of genus studied.

KEYWORDS: Pollen, pollen morphology, *Alysicarpus*,

INTRODUCTION

Alysicarpus is one of the small genera of family Fabaceae with 27 species and 15 intraspecific taxa. It is distributed in tropics and subtropics of world Polhill *et al.* (1981). India harbours nearly 60% of the taxa and is richly represented in the Maharashtra by 48 taxa, 12 species and 6 varieties Pokle (1999). Most of them are endemic to India with maximum occurs in Maharashtra.

In present investigation a comparative study of pollen morphology (shape, size, colpi length, margin, pore structure, exine surface etc) of *Alysicarpus* was undertaken. Banks *et al.* (2006). Pollen in the genus shows much homogeneity but are triangular or oval or spherical in shape. It was observed that heterogeneity in their sizes more conspicuously varies between 21.98 μ (*A. luteovexillatus*) to 50.24 μ (*A. ovalifolius*). In this present investigation 19 taxa of genus studied. This might be a useful parameter that can be used as taxonomic tool as a key for identification for different taxa in the genus. The collection number and localities of the specimens studied along with micrograph number are listed below.

- 1) *A. bupleurifolius* (L.) D.C. var. *bupleurifolius*. (DSP 009 Nanded.) Photo a
- 2) *A. bupleurifolius* (L.) D.C. var. *gracilis*. Baker. (ASD 995 Gautala.) Photo b
- 3) *A. naikianus* Pokle. (ASD 959. Appachi Wadi, Kolhapur.) Photo c
- 4) *A. gamblei* Schindl. (ASD 968 Belgaum(Karnataka)) Photo d
- 5) *A. heyneanus* Wt and Arn. var. *heyneanus*. (RPP 604 Majalgaon) Photo e
- 6) *A. heyneanus* Wt and Arn. var. *ludens* (Baker) Pramanik and Thoth. (ASD 611 Majalgaon.) Photo f
- 7) *A. scariosus* (Rottl ex Spreng) Grah ex Thw. var. *scariosus*. (ASD 661 Rajkot) Photo g
- 8) *A. scariosus* (Rottl ex Spreng) Grah ex Thw. var. *pilifer* (Prain) Pramanik et Thoth. (RPP 258. Anantpur A.P.) Photo h
- 9) *A. longifolius* (Rottl. ex Spreng) Wight and Arn. var. *major*. Pokle. (RPP 651 Bodeli) Photo i
- 10) *A. longifolius* (Rottl. Ex Spreng) Wight and Arn. var. *pygmeas*. Pokle. (ASD 660 Rajkot) Photo j
- 11) *A. tetragonolobus* Edgew. (ASD 929 Satara.) Photo k
- 12) *A. luteo-vexillatus* Naik et Pokle. (ASD 958 Savkheda.) Photo l
- 13) *A. pubescens* Law. var. *pubescens*. (ASD 960 Kolhapur) Photo m
- 14) *A. pubescens* Law. var. *vasavadae* (Hemadri) Sanjappa.(ASD 605 Majalgaon) Photo n
- 15) *A. monilifer* (L.) DC. var. *monilifer*. (ASD 915 Islapur, Nanded) Photo o
- 16) *A. monilifer* var. *mahbubnagarensis*. (Raghavrao et al.) Pokle. (ASD 977 Madhukarai) Photo p
- 17) *A. vaginalis* (L.) D.C. (ASD 679 Abu road, Mt Abu (Rajasthan)) Photo q
- 18) *A. ovalifolius* (Schumach) J. Leonard. (ASD 947 Aurangabad) Photo r
- 19) *A. hamosus* Edgew. (RPP 625 Bidar). Photo s

MATERIAL AND METHODS

Collection of pollen grains in viable condition is primary requirement for any experimental study on pollen. The pollens were collected early in the morning from the flowers before the anthesis and after anthesis process around 6 a.m. to 12 noon.

The flowers of the taxa are papilionoid type the pollens are released inside the keel before anthesis. On anthesis very little pollen are left in the keel. Vexillary stamen always covers the stigma in the keel therefore pollen is collected from flower buds exercised before anthesis but only after anther dehiscence. Pollen grains collected after dissection by removing the standard and wing petals and splitting open the two keel petals along the line of fusion (over a watch glass or petriplate or glossy paper) This action automatically unloads the pollen mass. In this way 100-200 pollen can

be easily collected from each flower. A precaution should be taken necessarily to collect pollen from known individuals without contamination from other individuals. Contamination can be avoided by collecting undehisced anthers or flower buds or allowing anther dehiscence to occur in the laboratory. The pollen grains were treated for acetolysis in a mixture of acetic anhydride and concentrated sulphuric acid (Erdtman, 1952). They were examined under compound microscope (10x X 40x) and the measurements were taken in micrometer. To reveal morphological details of few species Chitale technique also followed. It is as follows:

- 1) Chitale solution: Castor Oil: Kerosene (7:3)
- 2) Mix thoroughly and store in a bottle
- 3) Take a slide add a drop of solution.
- 4) Put a anther, crush in the drop.
- 5) Heat moderately and slowly till bubbling stops.
- 6) Clear the solution gently from periphery using blotter.
- 7) Add a drop of canada balsum and put cover glass.

After undergoing above lab techniques the slides were prepared, observed and micrographs were taken at high magnification on compound microscope.

RESULTS AND DISCUSSION

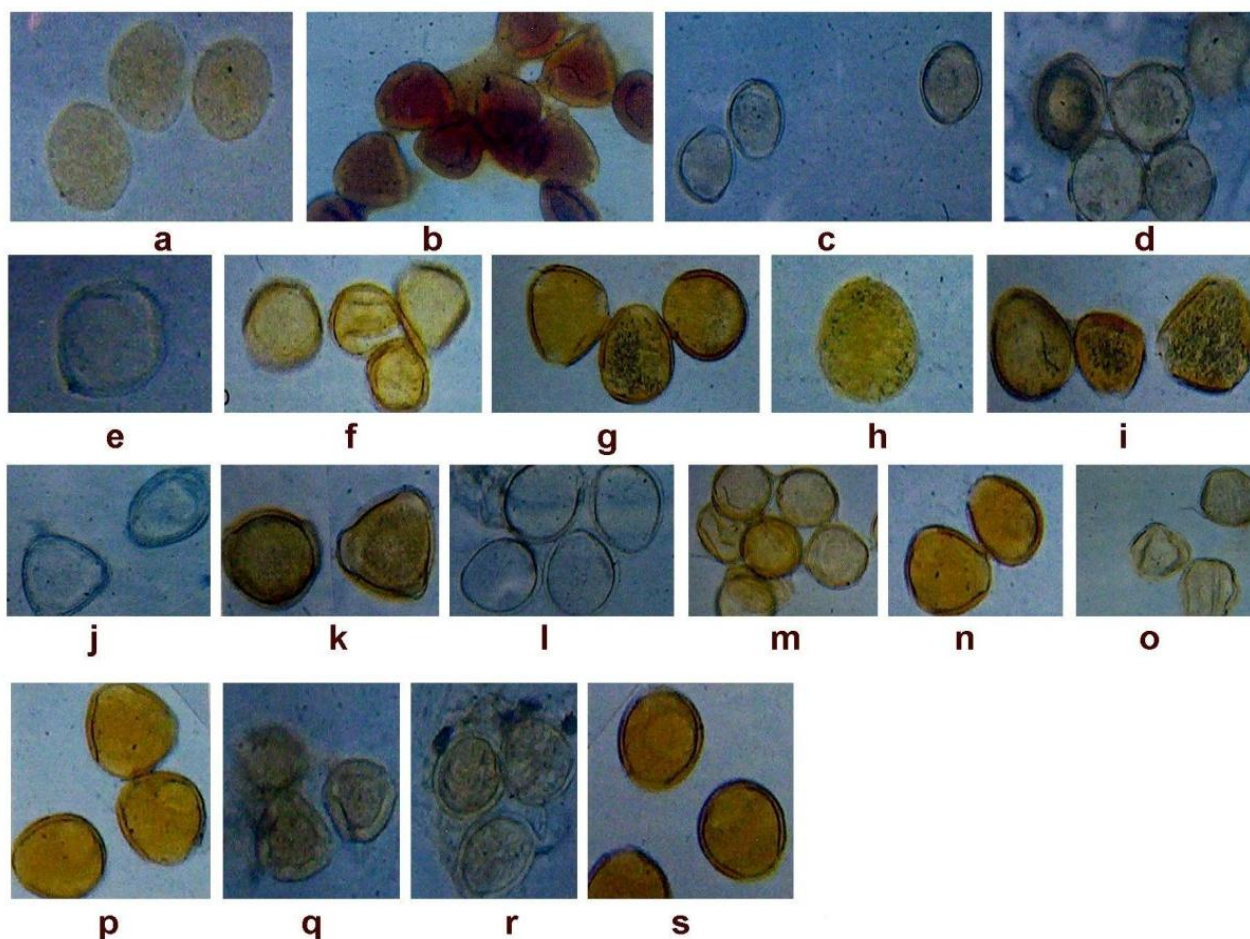
The analysis of pollen morphological study revealed that significant variation among different taxa of genus. It was observed that heterogeneity in their sizes more conspicuously varies between 21.98 μ (*A. luteovexillatus*) to 50.24 μ (*A. ovalifolius*) and mostly tricolpate, shapes spherical or triangular or oval in shape with variation in sizes which has been tabulated in Table-1 and Figure-1.

Table 1. Pollen Morphology

Sr. No.	Alysicarpus Species	Pollen Size (μ)			Shape of Pollen grain	Ornamentation
		1	2	3		
1.	<i>A. bupleurifolius</i>	40.82	43.96	43.96	Oval	Granulate
2.	<i>A. bupleurifolius</i> var. <i>gracilis</i>	40.82	43.96	37.68	Oval	Granulate
3.	<i>A. naikianus</i>	40.82	37.68	43.96	Triangular	Granulate
4.	<i>A. gamblei</i>	37.68	40.82	37.68	Triangular	Granulate
5.	<i>A. heyneanus</i>	28.26	31.40	34.54	Spherical	Granulate
6.	<i>A. heyneanus</i> var. <i>Ludens</i>	31.40	34.54	34.54	Triangular	Granulate
7.	<i>A. scariosus</i>	40.82	43.96	43.96	Triangular	Granulate
8.	<i>A. scariosus</i> var. <i>pilifer</i>	40.82	40.82	43.96	Oval	Granulate
9.	<i>A. longifolius</i>	37.68	40.82	40.82	Triangular	Granulate
10.	<i>A. longifolius</i> var. <i>pygmeas</i>	40.82	43.96	40.82	Triangular	Granulate
11.	<i>A. tetragonolobus</i>	43.96	47.10	47.10	Triangular	Granulate
12.	<i>A. luteovexillatus</i>	21.98	25.12	28.26	Spherical	Granulate
13.	<i>A. pubescens</i>	40.82	43.96	43.96	Spherical	Granulate
14.	<i>A. pubescens</i> var. <i>Vasavadae</i>	37.68	40.82	43.96	Oval	Granulate
15.	<i>A. monilifer</i>	40.82	43.96	40.82	Triangular	Granulate
16.	<i>A. mahbubnagarensis</i>	34.54	37.68	40.82	Triangular	Granulate
17.	<i>A. vaginalis</i>	31.40	34.54	37.68	Triangular	Granulate
18.	<i>A. ovalifolius</i>	43.96	47.10	50.24	Oval	Granulate
19.	<i>A. hamosus</i>	28.26	31.40	34.54	Oval	Granulate

μ : - Micron

Pollen morphology



a. *A. bupleurifolius*; b. *A. bupleurifolius* var. *gracilis*; c. *A. naikianus*; d. *A. gamblei*; e. *A. heyneanus*; f. *A. heyneanus* var. *ludens*; g. *A. Scariosus*; h. *A. Scariosus* var. *pilifer* i. *A. Longifolius*; j. *A. longifolius* var. *pygmeas*; k. *A. tetragonolobus*; l. *A. luteovexillatus*; m. *A. pubescens*; n. *A. pubescens* var. *vasavadae*; o. *A. monilifer*; p. *A. mahbubnagarensis*; q. *A. vaginalis*; r. *A. ovalifolius* & s. *A. hamosus*

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