

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Palynodiversity of Arborescent Plants of Caesalpiniaceae Family of Karimnagar District, Telangana State, India.

J Ganga Kailas, H Ramakrishna* and R Prabhakar.

Palaeobotany and Palynology Research Lab., Dept. of Botany, University College of Science, Osmania University, Saifabad, Hyderabad, Telangana State – 500004, India.

ABSTRACT

The present paper deals with the study of diversity in palynoflora of arborescent plants in Caesalpiniaceae family recorded from Karimnagar district. The palynoflora recorded in this study viz., *Bauhinia purpuria*, *B.racemosa*, *B.variegata*, *Cassia siamea*, *C. roxburghii*, *C. fistula*, *C. javanica*, *Delonix regia*, *Peltophorum pterocarpum*, *Tamarindus indica* and *Saraca asoca* are having variation in pollen morphological characters such as symmetry, polarity, shape, apertural pattern and sporoderm stratification. These taxa show more variation in sporoderm stratification than apertural pattern, polarity and symmetry. These taxa consist the dominance of tricolporate apertural pattern. This diversity helps in the taxonomy for further confirmation of arborescent taxa recorded from Karimnagar district.

Keywords: Pollen diversity, Caesalpiniaceae, Karimnagar district.

*Corresponding author



INTRODUCTION

Palynology is the study of pollen and spores. Palynological studies are not only helpful in solving many taxonomic problems but also useful to know the incidence of pollen which causes pollenosis and also to know the bee forage plants by means of melittopalynological studies.

The pollen of arborescent plants of Karimnagar district of Telangana state shows the more diversity in pollen morphology is the interesting aspect to the taxonomists and in particular to the palynologists. These morphological characters viz., symmetry, shape, polarity, apertural pattern and ornamentation, are useful for the further confirmation of identification of taxa recorded from this area.

MATERIAL AND METHODS

The pollen material was collected from Karimnagar district which lies between 18° N to 19° N longitudes and 78°30' E to 80° E latitudes and is situated in the Northern part of Telangana state and is surrounded by Adilabad in north, Nizamabad in west, Warangal in south and south west by Medak. The fresh flowers of these taxa were collected from this region and the taxa were identified with relevant literature (Gamble, 1935). The anther materials of these flowers were processed by using Erdtman's (1960) acetolysis technique to recover the pollen [1-2].

OBSERVATION

The pollen morphological characters of some arborescent Caesalpiniaceae family plants in Karimnagar district viz., *Bauhinia purpuria*, *B. racemosa*, *B. variegata*, *Cassia siamea*, *C. roxburghii*, *C. fistula*, *C. javanica*, *Delonix regia*, *Peltophorum pterocarpum*, *Tamarindus indica* and *Saraca asoca* were studied and described the pollen morphological characters under trinocular research microscope (Table.1) and (Plate.1). The descriptions of pollen are given below.

***Bauhinia purpurea* L.**

Pollen Prolate-spheroidal Polar view 70-74µm, Equatorial view 69-72µm, isopolar, radially symmetric, amb 90-94µm triangular-obtuse-plane, tricolporate, colpi narrowly elliptic 45µm long, 4µm wide sides tapering tips acute ora lalongate, exine 3.2µm thick sexine 2µm thick, nexine 1.2µm, ornamentation striate.

***Bauhinia racemosa* Lam.**

Pollen prolate 45-46µm, 42-43µm, isopolar, radially symmetrical, amb 45-46µm circular-triangular, tricolporate colpi long 36µm 4.5µm wide, tapering to ends, ora lalongate. Exine 3µm thick sexine thicker than nexine, ornamentation reticulate lumina variously polygonal 1µm across.

***Bauhinia variegata* L.**

Pollen spheroidal 45-47.5µm, 30.4-32µm, isopolar, radially symmetric, amb 45-47µm triangular, tricolporate colpi narrowly elliptic 44µm long, 3.5µm wide sides tapering towards end tips acute, ora lalongate. Exine 2µm thick sexine as thick as nexine, ornamentation striate.

***Cassia siamea* Lam.**

Pollen prolate 45-46µm, 45-46µm, isopolar, radially symmetric, amb 30-32µm triangular, tricolporate-syncolporate, exine 2µm thick sexine as thick as nexine ornamentation reticulate.

***Cassia roxburghii* DC.**

Pollen sub-prolate 30-32.5µm, 24-26 µm, isopolar radially symmetrical, amb 30-32µm triangular obtuse convex, tricolporate colpi long tips acute, exine 2µm sexine as thick as nexine, ornamentation reticulate.

***Cassia fistula* L.**

Pollen oblate-spheroidal 32-38µm, 33-38µm, isopolar, radially symmetric, amb 34-36µm triangular obtuse convex, tricolporate colpi linear 29µm long, 2µm wide, tips acuminate, ora lolongate, exine 2µm thick sexine thicker than nexine, ornamentation reticulate.

***Cassia javanica* L.**

pollen sub-prolate 23-25 µm, 17-19 µm, isopolar, radially symmetric, amb 25-26 µm, triangular, tricolporate, colpi long 10 µm, wide 2 µm, ora lolongate, exine 2.5 µm thick sexine thicker than nexine, ornamentation reticulate.

***Delonix regia* Raf.**

Pollen oblate to spheroidal 53-56µm, 57-60 µm, isopolar, radially symmetry, amb 50-55 µm circular, tricolporate colpi long ora lalongate, exine 5.2 µm thick sexine 3.2 µm, nexine 2 µm, ornamentation reticulate hererobrocate, meshes smaller near the aperture regions and larger inner side, lumina polygonal with the number of free bascules muri thick simply to locally duplibaculate.

***Peltophorum pterocarpum* (DC.)**

Pollen subprolate 48-49µm, 39-42µm, isopolar, radially symmetric amb 45-46µm circular, tricolporate colpi long 20µm, ora lolongate, exine 4.5µm thick sexine 3µm thick nexine1.5µm thin, ornamentation reticulate, muri 4.5µm polygonal homobaculate.

***Tamarindus indica* L.**

Pollen oblate-spheroidal 32-35µm, 40-45µm. isopolar, radially symmetric, amb 39-44µm rounded to triangular, tricolporate, colpi long extending up to the poles tips acute ora more are less lolongate. Exine 1.5µm thick ornamentation striate aligned radially from equator towards poles.

***Saraca asoca* L.**

Pollen oblate 21-23µm, 22.5-24µm, isopolar, radially symmetry amb 25-26µm circular, inaperturate, exine 1.5µm, sexine as thick as nexine, ornamentation rugulate.

Table: 1 Pollen morphological characters of the Caesalpiniaceae

S.No	Name of the Taxa	Polarity	Symmetry	Shape	Aperture	Ornamentation
1	<i>Bauhinia purpuria</i>	Isopolar	Radially	Prolate-spheroidal	Tricolporate	Striate
2	<i>Bauhinia racemosa,</i>	Isopolar	Radially	Prolate	Tricolporate	Striate
3	<i>Bauhinia variegata,</i>	Isopolar	Radially	Spheroidal	Tricolporate	Reticulate
4	<i>Cassia siamea,</i>	Isopolar	Radially	Prolate	Tricolpate-Syncolpate	Reticulate
5	<i>Cassia roxburghii,</i>	Isopolar	Radially	Sub-prolate	Tricolpate	Reticulate
6	<i>Cassia fistula</i>	Isopolar	Radially	Oblate-spheroidal	Tricolporate	Reticulate
7	<i>Cassia javanica</i>	Isopolar	Radially	Subprolate	Tricolpate	Reticulate
8	<i>Delonix regia</i>	Isopolar	Radially	Oblate	Tricolporate	Reticulate
9	<i>Peltophorum pterocarpum</i>	Isopolar	Radially	Subprolate	Tricolporate	Reticulate
10	<i>Tamarindus indica</i>	Isopolar	Radially	Oblate-spheroidal	Tricolporate	Striate
11	<i>Saraca asoca</i>	Isopolar	Radially	Oblate	Inaperturate	Rugulate

DISCUSSION

Pollen grains of Caesalpiniaceae were generally symmetrical, isopolar, oblate to prolate-spheroidal, rarely sub-prolate, and tricolporate. They tended to be either thicker or thinner than the nexine, rarely being the same thickness. The ornamentation is reticulate, rugulate, psilate, striate and rarely rugulate. Apertural type, shape and ornamentation are important characters in the palynotaxonomy to identification of taxa up to species level.

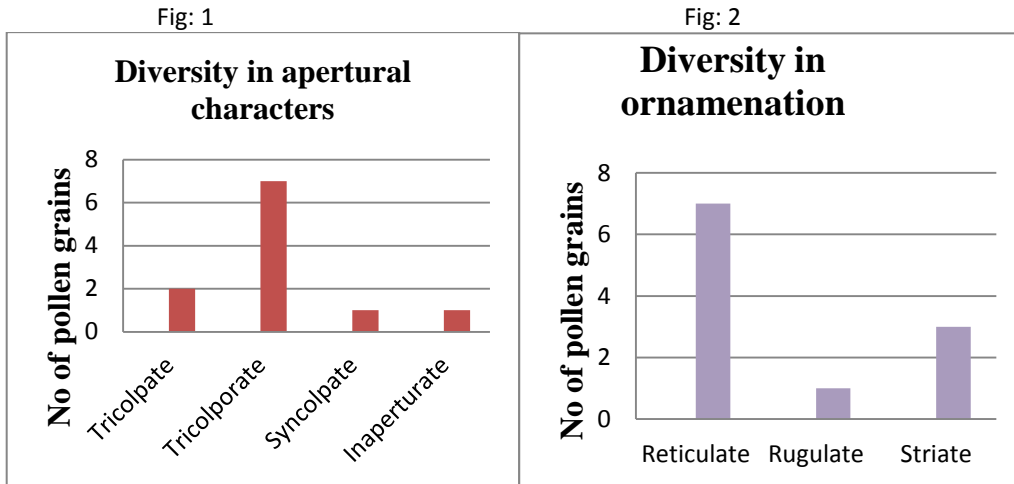
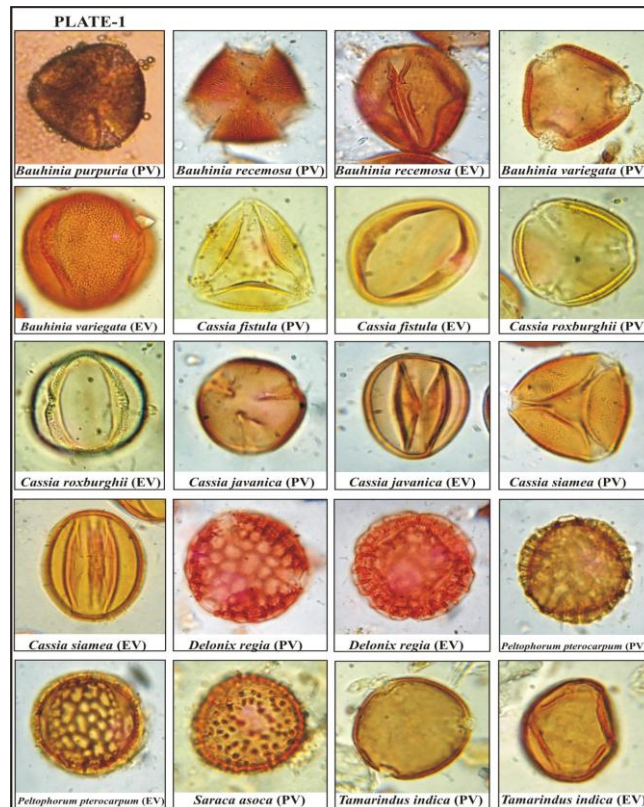


Plate: 1 pollen grains of Caesalpiniaceae



B.racemosa and *Cassia siamea* pollen are prolate, *B.purpuria* was prolate-spheroidal, *B.variegata* was spheroidal, *Saraca sacosa* was oblate, *Cassia fistula*, *Tamarindus indica* and *Delonix regia* were oblate-spheroidal, and *Peltophorum pterocarpum* was subprolate shape. *Bauhinia purpuria*, *B.racemosa*, *B.variegata*, *Cassia fistula*, *Peltophorum pterocarpum*, and *Tamarindus indica* are having tricolporate where as *Cassia*



javanica and *C.roxburgii* has tricolpate. Tricolporate is dominant over other types (Fig: 1). There is more variation in sporoderm stratification. Reticulate pollen grains are *Bauhinia variegata*, *Cassia siamea*, *C.roxburgii*, *C.fistula*, *C.javanica*, *Delonix regia*, and *Peltophorum pterocarpum*, where as striate in *Bauhinia racemosa* and *Tamarindus indica* and rugulate in *Saraca asoca*. In this reticulate ornamentation is dominant when compare to other types (Fig: 2).

The pollen morphological characters of arborescent plants of Caesalpiniaceae viz., *Bauhinia purpuria*, *B.racemosa*, *B.variegata*, *Cassia siamea*, *C.roxburghii*, *C. fistula*, *C. javanica*, *Delonix regia*, *Peltophorum pterocarpum*, *Tamarindus indica* and *Saraca asoca* of Karimnagar district have diversity in symmetry, apertural pattern and sporoderm stratification. All the pollen grains are symmetric and isopolar,. But the apertural pattern sporoderm characters are varying in the taxa. Hence this diversity is useful in taxonomical identification.

AKNOWLEDMENT

The authors are thankful to Prof. C.G.K. Ramanujam for his kind cooperation and guidance. is are also thankful to my friends for their help in the collection of pollen material. We are grateful to Principal U.C.S, Saifabad O.U. for providing lab facilities.

REFERENCES

- [1] Erdtman, G.1960.Svens.Botan.tidskr. 54: 561 –564.
- [2] Gamble, J.S. 1935. Flora of presidency of Madras. V.I.II.I