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Diversity in Syncolpate Pollen of Arborescent Taxa in Karimnagar District, Telangana State, India.

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ABSTRACT

The present investigation deals with the study of syncolpate pollen character in the arborescent pollen taxa of *Careya arborea*, *Cassia fistula*, *Cassia siamea*, *Callistemon citrinus*, *Clerodendrum phlomidis*, *Eucalyptus tereticornis*, *Psidium guajava*, *Prosopis juliflora*, *Schleichera oleosa*, *Syzygium cumini*, *Thevetia neriifolia* and *Zizyphus mauritiana*. These taxa belong to Fabaceae, Lecythidaceae, Lythraceae, Myrtaceae and Sapindaceae families. The pollen of these arborescent plants have diversity in pollen morphological characters viz., symmetry, shape, polarity and ornamentation but significantly all the pollen taxa have syncolpate apertural partten. This study provides palynological data of the syncolpate pollen taxa, which will be useful for future palynotaxonomic studies to identify the arborescent plants of Karimnagar district.

Keywords: Diversity, syncolpate pollen, arborescent taxa and karimnagar district.

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INTRODUCTION

Karimnagar district is one of the largest districts in Telangana state, which has arborescent plants both in irrigated and forest localities. It is situated between 18° N to 19° N longitudes and 78°30' E to 80° E latitudes in the Northern part of Telangana state and is bounded by Adilabad in north, Nizamabad in west, Warangal in south and south west by Medak. It has dry deciduous forest with diversity in flora.

The present paper reveals the pollen diversity of syncolpate pollen taxa. The diversity in these syncolpate pollen of arborescent taxa of Karimnagar district of Telangana state is interesting to the taxonomists and in particular to the palynologists due to diversity in symmetry, shape, polarity, apertural pattern and ornamentation for the further confirmation of identification of taxa.

MATERIALS AND METHODS

The anthers of arborescent plants, which were identify with relevant literature (Gamble 1935), was collected from Karimnagar district. The anther materials of these flowers were processed by using Erdtman's (1960) acetolysis technique to recover the pollen. The pollen was studied under a trinocular research microscope and observed the characters. These prepared pollen slides were deposited in Palaeobotany - Palynology Research lab, Department of Botany, University College of Science, Saifabad, Osmania University, Hyderabad.

RESULTS

Careya arborea, *Cassia fistula*, *Cassia siamea*, *Callistemon citrinus*, *Clerodendrum phlomidis*, *Eucalyptus tereticornis*, *Psidium guajava*, *Prosopis juliflora*, *Schleichera oleosa*, *Syzygium cumini*, *Thevetia neriifolia* and *Zizyphus mauritiana* pollen collected from karimnagar district were studied and recorded syncolpate character besides the diversity in other pollen morphological characters viz., size, shape, polarity symmetry and ornamentation (Table.1 and Plate.1). The descriptions of pollen are given below.

Table 1: Syncolpate pollen morphology

S.no	Name of the taxa	Shape	Symmetry	Polarity	Ornamentation
1	<i>Callistemon citrinus</i>	Oblate	Bilateral	Isopolar	Psilate
2	<i>Careya arborea</i>	Oblate	Bilateral	Isopolar	Psilate
3	<i>Cassia fistula</i>	Prolate	Bilateral	Isopolar	Reticulate
4	<i>Cassia siamea</i>	Prolate	Bilateral	Isopolar	Reticulate
5	<i>Clerodendrum phlomidis</i>	Prolate	Bilateral	Isopolar	Granular
6	<i>Eucalyptus tereticornis</i>	Prolate	Bilateral	Isopolar	Psilate
7	<i>Prosopis juliflora</i>	Subprolate	Bilateral	Isopolar	Reticulate
8	<i>Psidium guajava</i>	Oblate	Bilateral	Isopolar	Granular
9	<i>Schleichera oleosa</i>	Prolate	Bilateral	Isopolar	Striate
10	<i>Spathodea campanulata</i>	Suboblate	Bilateral	Isopolar	Retipilate
11	<i>Syzygium cumini</i>	Oblate	Bilateral	Isopolar	Psilate
12	<i>Thevetia neriifolia</i>	Prolate	Bilateral	Isopolar	Psilate
13	<i>Zizyphus mauritiana</i>	Prolate	Bilateral	Isopolar	Rugate

1. *Callistemon citrinus* R.Br.

Fabaceae

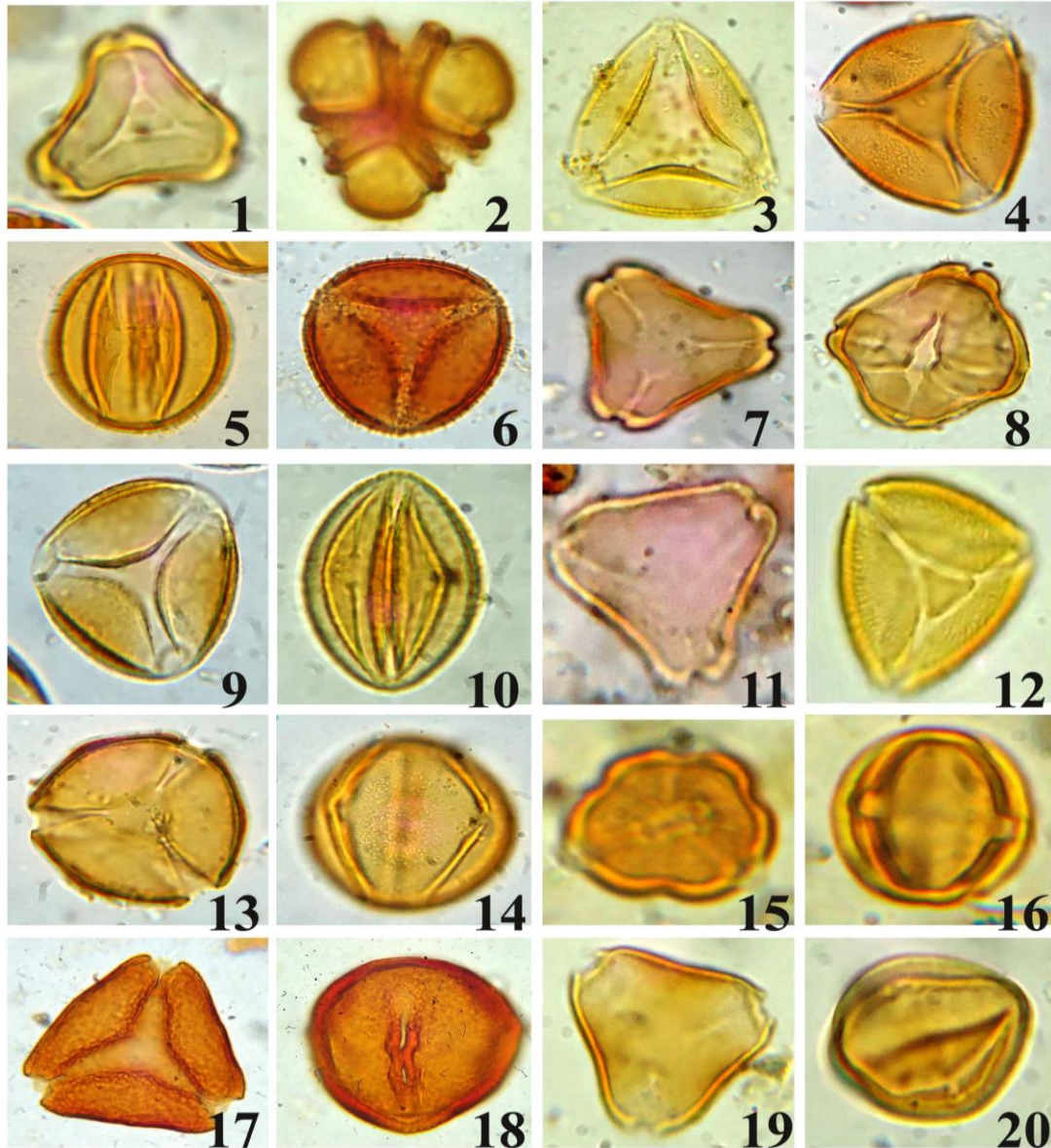
Oblate 13 µm x 18 µm, bilateral, isopolar, amb triangular 18-20 µm, tricolporate-syncolpate, colpi 8 µm long, 0.6 µm wide, tips acute, ora lologate. Exine 2.5 µm thick, sexine is thicker than nexine. Ornamentation psilate.

2. *Careya arborea* Roxb.

Lecythidaceae

Oblate 26 µm x 42 µm, bilateral, isopolar, amb triangular 30 µm, tricolpate-syncolpate, colpi long tips acute. Exine 2 µm thick, sexine thicker than nexine. Ornamentation psilate.

Plate 1: Syncolpate pollen diversity



1. *Callistemon citrinus*, 2. *Careya arborea*, 3. *Cassia fistula*, 4. 5. *Cassia siamea*, 6. *Clerodendrum phlomidis*, 7, 8. *Eucalyptus tereticornis*, 9, 10. *Prosopis juliflora*, 11. *Psidium guajava*, 12. *Schleichera oleosa*, 13, 14. *Spathodea campanulata*, 15, 16. *Syzygium cumini*, 17, 18. *Thevetia peruviana* and 19, 20. *Zizyphus mauritiana*.

3. *Cassia fistula* L.

Fabaceae

Pollen prolate 29 μm x 20 μm , isopolar, radially symmetric, amb 24 μm triangular obtuse convex, tricolporate colpi linear 29 μm long, 2 μm wide, tips acuminate, ora lolongate, exine 2 μm thick sexine thicker than nexine, ornamentation reticulate.

4. *Cassia siamea* (Lam.)

Fabaceae

Pollen prolate 45 μm x 30 μm , bilateral, isopolar, amb 45 μm triangular, tricolpate-syncolpate. Exine 2 μm thick, sexine as thick as nexine. Ornamentation reticulate.

5. *Clerodendrum phlomidis* Linn.f.Lamiaceae

Prolate 60 μm x 38 μm , amb circular 55-60 μm , isopolar, bilateral symmetrical, tricolporate, colpi long tips acute. Exine 2-3 μm thick, sexine 1.25 μm thick, nexine 1 μm . Ornamentation granular.

6. *Eucalyptus tereticornis* Sm.

Myrtaceae

Prolate 21 x 13 μm , bilateral, isopolar, amb triangular 22 μm , tricolporate-syncolpate. Exine 1.5 μm thick, sexine as thick as nexine. Ornamentation psilate.

7. *Prosopis juliflora* (Sw.) DC.

Fabaceae

Subprolate 38 μm x 30 μm , bilateral, isopolar, amb circular 36 μm , tricolporate-syncolpate, colpi tapering towards end, tips acute, ora lalongate. Exine 3.2 μm thick, sexine thicker than nexine. Ornamentation reticulate.

8. *Psidium guajava* L.

Myrtaceae

Oblate 14 x 26 μm , bilateral, isopolar, amb triangular 24 μm , tricolporate colpi long, ora lalongate. Exine 1.5-2 μm thick, sexine as thick as nexine. Ornamentation granular.

9. *Schleichera oleosa* (Lour.) Merr.

Sapindaceae

Prolate 27 μm x 19 μm , bilateral, isopolar, amb triangular 27 μm , tricolporoidate-syncolpate, colpi long, tips acute, ora circular. Exine 1.5 μm thick, sexine as thick as nexine. Ornamentation striate.

10. *Spathodea campanulata* P.Beauv.

Bignoniaceae

Suboblate 18 μm x 21 μm , bilateral, isopolar, amb circular 19.5 μm , tricolporate colpi long, ora lalongate. Exine 1.5 μm thick, sexine as thick as nexine. Ornamentation retipilate hetero brochate.

11. *Syzygium cumini* (L.) Skeels.

Myrtaceae

Oblate 12 x 17 μm , bilateral, isopolar, amb triangular 16 μm . tricolporate, syncolpate, ora lalongate. Exine 1.25 μm thick, sexine as thick as nexine. Ornamentation psilate.

12. *Thevetia neriifolia* Juss.

Apocynaceae

Prolate 17 μm x 11 μm , bilateral, isopolar, amb circular 17 μm , tricolpate, colpi long narrowly elliptic tips acute. Exine 1.5 μm thick, sexine as thick nexine. Ornamentation psilate.

13. *Ziziphus mauritiana* Lam.

Rhamnaceae

Prolate 24 μm x 16 μm , bilateral, isopolar, amb triangular, tricolporate colpi long narrowly elliptic tips acute. Exine 1.5-2 μm thick, sexine as thick as nexine. Ornamentation rugate.

DISCUSSION

Palynology is one of the important taxonomical tools to identify the plants up to species level due to their diversity in pollen morphological characters. Pollen morphological characters of syncolpate were described and recorded the diversity in shape, polarity and ornamentation. All pollen taxa have bilateral symmetrical and isopolar. There is variation in the shapes of the pollen grains viz., prolate, oblate-spheroidal, and Oblate on the P/E X 100 values (Table: 1). *Callistemon citrinus*, *Careya arborea*, *Psidium guajava* and *Syzygium cumini* were recorded as Oblate. *Spathodea campanulata* are suboblate in shape. *Cassia fistula*, *Cassia siamea*, *Clerodendrum phlomidis*, *Eucalyptus tereticornis*, *Schleichera oleosa*, *Thevetia neriifolia* and *Zizyphus mauritiana* are prolate. *Prosopis juliflora* is subprolate pollen (Fig: 1). Ornamentation is indicated by reticulate, psilate, retipilate, rugate, striate and granular (Table 1 and Fig: 2). *Callistemon citrinus*, *Careya*

arborea, *Eucalyptus tereticornis*, *Syzygium cumini* and *Thevetia nerifolia* are Psilate. Reticulate pollen are recorded in *Cassia fistula*, *Cassia siamea* and *Prosopis juliflora*. *Clerodendrum phlomidis* and *Psidium guajava* are recorded as granular. *Schleichera oleosa* is striate. *Spathodea campanulata* is retipilate, whereas *Zizyphus mauritiana* is rugulate. Hence the diversity in syncopate pollen recorded in arborescent plants of karimnagar district were also recorded in the honey samples of Nizamabad and Adilabad districts of Telangana state and Paderu forest division of Vishakapatanam district in Andhrapradesh. (Ramakrishna and Bhushan 2004, 2006. Swathi and Ramakrishna 2012, 2013 and Devender and Ramakrishna 2015), which will be useful for authentic confirmation of identification in pollen taxonomical studies.

Fig 1: Diversity in shape

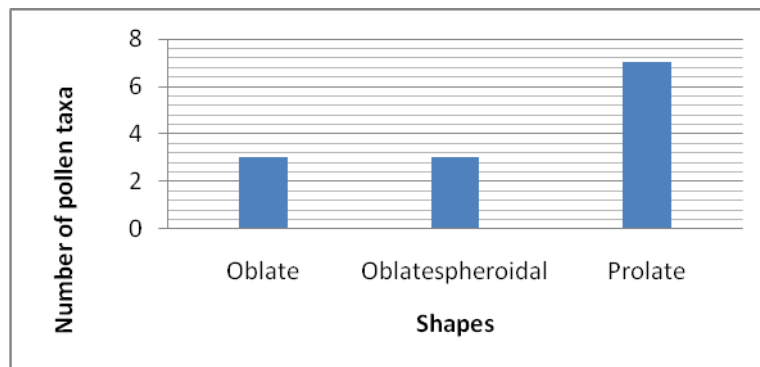
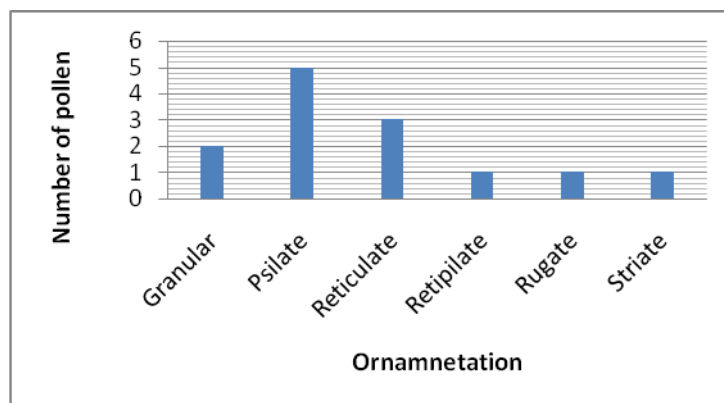


Fig 2: Diversity in ornamentation



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