



ISSN: 0976-3031

Available Online at <http://www.recentscientific.com>

CODEN: IJRSFP (USA)

International Journal of Recent Scientific Research
Vol. 9, Issue, 2(D), pp. 23973-23975, February, 2018

**International Journal of
Recent Scientific
Research**

DOI: 10.24327/IJRSR

Research Article

THE MORPHOLOGICAL DIVERSIFICATION OF POLLEN GRAINS OF THREE DIFFERENT SPECIES BELONGS TO (LAMIACEAE, ASCLEPIADACEAE, EPHORBIACEAE)

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DOI: <http://dx.doi.org/10.24327/ijrsr.2018.0902.1572>

ARTICLE INFO

Article History:

Received 15th November, 2017

Received in revised form 25th

December, 2017

Accepted 23rd January, 2018

Published online 28th February, 2018

Key Words:

pollen grains, emblica officinalis ,
Ocimum sanctum , Pollinial Morphology,
medicinal plants pollinia

ABSTRACT

Pollen grains are Microscopic Structures that carry the Male Reproductive cell of plants. The inner part of the grain contains cytoplasm along with the tube cell and the generative cell and the outer shell is made of two layers.

The pollen grains are produced during sexual reproduction within the anther of flower and its male gametophyte of the plant. The mass of pollen grains is called Pollinia.

The structural morphology of the pollen grains carried out with a light microscope is reported. Characters measured on the pollen grains were pollen grain shape, size, position, orientation of pollinia, translator attachment, furrow position are important criteria for the studies of Pollinial Morphology. This study analyzed the pollinial morphology of some selected medicinal plants taxa like *Ocimum sanctum* (L), *Calotropis gigantea* (L), *emblica officinalis* (L) are collected from different plants of surrounding areas of Siddipet in Telangana.

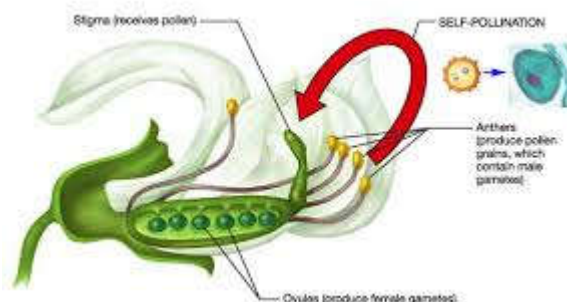
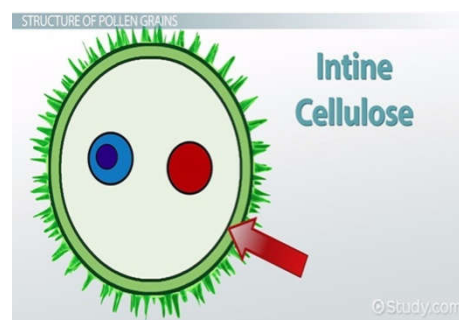
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INTRODUCTION

Pollen grains are Microscopic Structures that carry the Male Reproductive cell of plants. The inside of the grain contains cytoplasm along with the tube cell and the Generative cell. The outer shell is made of two layers.

The pollen grains are produced during sexual reproduction sexually within the anther of flower and its gametophyte of following plants. The mass of pollen grains is basically called Pollinia. The pollen grain from a fresh anther for the identification of a specific plant, species belonging to the three families Lamiaceae, Asclepiadaceae and Euphorbiaceae Dicotyledons. Pollinial characters are now being used as an important taxonomical tool for reassessing the different types of plant groups.

The structural morphology of the pollen grains carried out with a light microscope is reported. Characters measured on the pollen grains were pollen grain shape, size, position, orientation of pollinia, translator attachment, furrow position are important criteria for the studies of Pollinial Morphology. This study analyzed the pollinial morphology of some selected medicinal plants taxa like *Ocimum sanctum* (L), *Calotropis gigantea* (L), *emblica officinalis* (L) are collected from different plants of surrounding areas of Siddipet in Telangana.



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Pollen grain structure

Lamiaceae have some 200genera and 3200 species, mostly distributed in the mediterrnian region. Asclepiadaceae family plants are mostly 345genera and 2900 species, distributed, dry soils in tropical regions. Euphorbiaceae family one of the sixth largest families of Angiosperm. It have some 700 genera and 500 species. This family distributed in Tropical regions.

The members of the three families are in (Lamiaceae) Tulasi anthers ditheous basifixed, Introse, longitudinal dehiscence and in calotropis anthers ditheous, basifixed Introse, fused with stigma to form a Pentagular structure called Gynostegium. Pollengrains get pollinated with the helps of Insects by translater mechanism (Erdtman, 1952); (Corry1883). And in emblica officinales basifixed, Introse, longitudinal dehiscence. Pollengrain motphology is taxonomically significant like the pollen morphology of other angiospeme. The size and shape of pollengrain, colour of, orientation of pollengrain, apertuter pollengrains etc.. are important features for analysis of phylogentic study. Pollen morphology of Lamianaceae, Asclepiabaceae, Euphobiaceae have been surveyed and summarized by Schill and Jakel(1978) Brown(1811).

Improtance of the Pollen Grain in Taxonomy

Pollen is the Reproductive Materials same family plants use to Fertilizer each other. The flower blooms to produce fertilized seeds and fruit. Flowers and plants can be humanly breed for beauty and Fragrance or food/ medicine creation, Pollen is the Reproductive engine that powers sexual plants breeding. Asexual plants is usually called cloning or simply Propagation to mirror image create a plant without genetic material from other plants.

Later various people studied the Function of pollen and Spores and the role played by them in Fertilization of ovule-(Robert Brown -1809) first noted the importance of pollen in Systematic studies of Spermatophytes.

Well, it all beings in the flower. Flowering plants have several Different plants that are Important in pollination. Flower have male parts called stamens that produce a sticky Powder called pollen. Flowers also have a female part called the pistil.

Pollen spread with the wind (or) through interaction with insects. The outer wall the pollen grain is strong to Prevent damage during.

MATERIALS AND METHODS

We selected three plants in three family from Siddipet district of Telangana of India. Generally these plants grow in dry soils and have highly ethno medicinal values.



Figure 1A [Tulasi Twig]



Figure 1B [Tulasi Pollengrain]

They are Ocimum sanctum (L) [Figure 1A to 1B] calotropis gigantean [Figure 2A -2D]; Emblica officinalis [Figure 3A-3B] fresh flowers in the form of Inflorescence were collected between 9-12 AM and Pollengrain were removed from freshly opened flowers the pollengrain collected randomly and measurments were taken using light microscope and phase contrast microscope.



Figure (Amla; 2A)



Figure (calotropis flower 3A)

Pollen grain Morphology

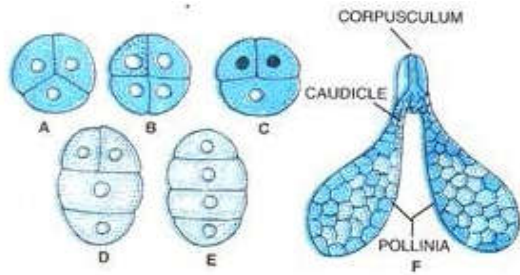
A Swedish scientist Gunnar Erdtman who established to subject of paleontology of modern plants coined all the time used in poleontology . He called as father of poleontology.

The lamiaceae (ocimum sanctum) pollen grains monads radially, symmetrical, isopolar. The asclepiadaceae (calotropis

gigantean) has five pollinium each of which consists of two pollinia. Pollinia have a pair of pollinal sac connected to a central corpusculum through a pair of caudicles. The Euphorbiaceae(emblica officinalis)pollen grains are isopolar radially symmetrical,anther sac are united pollen grain internal surface are granular.

RESULT AND DISCUSSION

The three families pollen grain showed a great variation in form varying from to globular,.



Kinds of Microspore tetrads in angiosperms. A—Tetrahedral tetrad; B—Isobilateral tetrad; C—Decussate tetrad; D—F shaped tetrad; E—Linear tetrad; F—Pollinium of Ak or Calotropis.

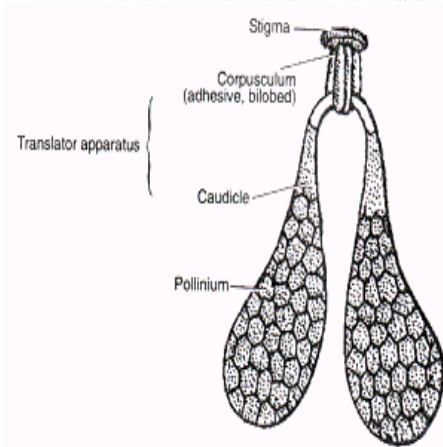


Figure (calotropis translator 3B, 3C)

The size shape colour pollen grain attachment, orientation of pollen grains position of pollen grains within anther etc, are valuable charecters for analysis of diversification of pollinia of the Lamiaceae Asclepiadaceae Euphorbiaceae families in the anther sac thin and pollen grains are granular, Asclepiadaceae pollinial sacs are thin and flat the largest pollinial sac found in Calotropis. Euphorbiaceae anther sacs are flatter.

The differentiation pollen grains of three families are as follows:

Name of the plant	Size of pollen grain	Shape of pollen grain	Color of pollen grain	Orientation of pollen grain	Apertures
Ocimum sanctum	40-50µm	Round	Lemmon yellow	Horizontal	6colpates
Calotropis gigantea	50 µm	Oval	Canary yellow	Pendulous	5colpates
Emblica officinalis	45 µm	Round	Yellow	Horizontal	5colpates

CONCLUSION

On the basis of our observation of three different families pollen grains, we conclude that the pollen grains of different families are varies in morphology. The size, shape and color of the pollen grains are different.

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How to cite this article:

Swapna S.2018, Study on The Morphological Diversification of Pollen Grains of Three Different Species Belongs To (Lamiaceae, Asclepiadaceae, Ephorbiaceae). *Int J Recent Sci Res.* 9(2), pp. 23973-23975.
 DOI: <http://dx.doi.org/10.24327/ijrsr.2018.0902.1572>
