

Pollen Diversity of Sri Ram Narayan Khedia Government Degree College Banswada, Kamareddy District, Telangana State, India

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ABSTRACT

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The present paper study on the study of pollen diversity of 31 plants from various gardens of Sri Ram Narayana Khedia Government Degree College Banswada, Kamareddy district, Telangana state, India. These plants some are medicinal, ornamental and tree members. The pollens of these plants have diversity of morphological characters viz., symmetry, shape, polarity, aperture patterns and sculpture. In the present study, a total of 31 plant species belongs to 19 families. The plants with Spheroidal shape pollen *Catharanthus roseus*, *Lantana camara*, *Bougainvillea spectabilis*, *Tridax procumbens*, *Pseuderanthamum*, *Ixora coccinea*, *Jasminum sambac*, *Hibiscus rosa-sinensis*, *Pulmeria alba*, *Euphorbia heterophylla*, *Cynodon dactylon*, *Ghompherna celosioides*, *Hibiscus syriacus*, *Tecomaria capensis*, *Turnera ulmifolia*, *Punica grantum*, *Cleome gynandra*, *Oxalis dilenii*, *Nerium oleander*, *Ghompherna globosa*, *Datura stramonium*, *Jatropa integrerrima*, *Cyanthillium cinereum*, *Delonix regia*, *Tecoma stans*. The plants with Symmetrical pollen is *Parthenium hysterophorus*. The plant with Irregular pollen shape is *Callaindra*. The plants with Cylindric pollen shape *Bauhinia racemosa*, *Crossandra infundibuliformis*. The plant with Boat shaped pollen is *Hymencallis littoralis*, are reported. This plant species diversity record which is helps to the identification of Indian pollen flora.

Keywords : Pollen diversity, pollen morphology and SRNK GDC-Banswad.

I. INTRODUCTION

Pollen is a mass of microspores in a seed plant appearing usually as a fine dust. Each pollen grain is minute body, of varying shape and structure formed in the male structures of seed bearing plants and transported by various means to the female structures, where fertilization occurs. Pollen morphology has a great potential as a means of classification, and is frequently utilized to clarify taxonomic questions

(Nowicke & Ridgeway 1973, Wodhouse 1965, Nowicke & Miller 1990, Taroda & Gibbs 1986a, Diez et al. 1986, Miller & Nowicke 1989, Diez & Valdes1991). Hence the pollen grains are of great value in ascertaining purity of drug and identification. The significance of palynology in pharmacognosy and taxonomy is known since a long time. The branch of pharmacopalynology has attracted the attention of scientist in general and palynologists in particular equally. A large proportion of species which can

recognised from their pollen grains (Clarke 1977). Pollen grains and spores as a rule are only a few hundred of a millimeter in size called as bio-pollutants can be studied in an enlarged state and can be used as a solid mean for the identification, classification, and determination of affinity and so on of vegetation of a particular region.

Additionally given their remarkably symmetrical structure and surface patterns fresh and preserved pollen grains are can be recognizable under the microscope. Pollen is produced in such quantities that are a significant component of the airborne constituents of Earth's atmosphere, especially in areas over continents. Pollen grains come in a wide variety of shapes, sizes, and surface markings characteristic of the species. Pollen grains of pines, firs, and spruces are winged. The smallest pollen grain, that of forget-me-not, is 0.005mm in diameter. Corn pollen grains are large about 90-100um. Most grass pollen is around 20-25um. In most of the plants the mature pollen grain has a double wall. The exine often bears spines or warts, or is variously sculptured, and the character of markings is value for identifying genus, species. The spines may be less than in micron in length reffered to as spinulose (scarbate) or longer than a micron reffered to as echinate. Various terms also describe the sculpturing such as reticulate, a net like appearance consisting of elements separated from each other by lumen. These reticulations may also be reffered to as brochi.

Palynology is a brach of botany where we study the morphological characters of spore and pollen grains. The term palynology first introduced Hyde and Williams in the year 1944 . In our work we have gone through the characteristics features of pollen which are important to taxonomy. The apertural pattern and sculpturing pattern of pollen grains are very much significant in the identification of the taxa. Apertural pattern includes both simple and composite forms like tricolporate, tri-tetracolporate, triporate, and tetra hexa porate. The sculpturing diversity of palynotaxa is

indicated by reticulate, microreticulate, verrucate, and granular to psilate pattern

II. METERIALS AND METHODS

The pollen used in this study were collected from various gardens of Sri Ram Narayana Khedia Govt. Degree College Banswada, Kamareddy district, Telangana state, India. Banswada is located at 18.38330N, 77.88330E having an average elevation of 371meters [1220feets]. It is in area of 15.96km². weather 270C wind N/W at 8km/h. 59% humidity. The pollen compared with herbaria specimens of Botany deportment laboratory. The pollen were produced from newly dehised anthers under a dissecting microscope and placed in centrifuged and acetolyzed according to Erdtman. Permanent slides were made with the material mounted in glycerine jelly and sealed with paraffin and deposited in Department Of Botany Sri Ram Narayana Khedia Government Degree College Banswada, Kamareddy district, Telangana state, India. The pollen types and sub types are based on characters discernible in light microscope .The palyological terminology used in accordance with Erdtman. The process of acetolysis is mainly carried out to remove the protoplast contents of pollen grains acetolysis impacts chestnut brown colour to the pollen grains. Further it dears the wall making it more translucent which facilitates detailed study of its structure and sculpture ornamentation.

III. RESULT AND DISCUSSION

The work on pollen allergy was initiated in the 1950's by Shivpuri in Delhi. Subsequently, Kaliwal and his colleagues reported important pollen allergens of Jaipur (Kasilwal et al., 1958). From south india Cassia, Ageratum, Salvadora, Ricimus, Albizia lebbeck and Artemisisa scoparia have been reported as important aeroallergens (Acharya. 1980; Agashe and Anand, 1982). Subbarao et al., 1985 recorded allergenicity to Parthenium hysterophorus pollen extracts in 34% of

allergic rhinitis and 12% Bronchial asthma patients
Bangalore.

TABLE NO: 1 LIST OF POLLEN GRAINS DIVERSITY IN OUR COLLEGE CAMPUS

POLLEN DIVERSITY OF SRI RAM NARAYAN KHEDIA GOVERNMENT DEGREE COLLEGE BANSWADA, KAMREDDY DIST. TELANGANA						
S. No	COMMON NAME	SCIENTIFIC NAME	FAMILY	SHAPE	APETURE TYPE	ORNAMENTATION
1	Bright eyes	<i>Catharanthus roseus</i>	Apocynaceae	Spheroidal	Tricolporate	Perforate
2	West indian cantana	<i>Lanthona camara</i>	Varbenaceae	Spheroidal	Colporous, Tricolporate	perforate, Psilate
3	Carrot grass	<i>Parthenium hysterophorous</i>	Asteraceae	Symmetric al	Triozonocalporate	Non-loculate, echinate
4	Paper flower	<i>Bougainvillea galbera</i>	Nyctaginaceae	Spheroidal	Tricolporate	Baculate, Reticulate
5	Redpoder puff	<i>Callindra</i>	Fabaceae	Irrgular	Porous porate	Verrucate, psilate
6	Coat buttons	<i>Tridox procumbers</i>	Asteraceae	Spheroidal	Tetracolporate	Echinate
7	Purale false ernatheum	<i>Pseudoernathium</i>	Acanthaceae	Spheroidal	Tricolporate, colporate	Reticulate
8	Orchid tree	<i>Bauhinia variegata</i>	Fabaceae	Cylindric	Colporous, Tricolporate	Reticulate
9	Nuru varahalu	<i>Ixora coccinea</i>	Rubiaceae	Spheroidal	Colporous, colporate	Microreticulate, Cutalate
10	Kanakambaralu	<i>Crossandra infandibuliformis</i>	Acanthaceae	Cylindric	Colpus, tricolporate	Reticulate, scabrate
11	Arabian jasmim	<i>Jasminum sambac</i>	Oleaceae	Spheroidal	Colpus, colporate, tricolporate	Reticulate
12	China rose	<i>Hibiscus rosa sinesis</i>	Malvaceae	Spheroidal	Porous, pantoporate	Echinate
13	White franigipani	<i>Pulameria alba</i>	Apocynaceae	Spheroidal	Colporous, tricoporate	Psilate
14	Fire plant	<i>Euphorbia heterophylla</i>	Euphorbaceae	Spheroidal	Colpus, tricolporate	Reticulate
15	Bermuda grass	<i>Cynodon dactylon</i>	Poaceae	Spheroidal	Ukus, ukarate	Microechenate, aerolate
16	Bachelors button	<i>Gomphrena celosioides</i>	Amaranthaceae	Spheroidal	Porous, pantoporate	Microechenate, lophate

17	Rose of sharon	<i>Hibiscus syriacus</i>	Malvaceae	Spheroidal	Porus, pantoporate	Echinate, perforate
18	Cape honeysuckle	<i>Tecomaria capensis</i>	Bignoniaceae	Spheroidal	colpus, tricolpate	reticulate
19	West indian holly	<i>Turnera ulmiafolia</i>	Passifloraceae	Spheroidal, circular	No-aperture	Clavate
20	Pome granate	<i>Punica granatum</i>	Punicaceae	Spheroidal	Colporus, colpate	Regulate
21	The beach spider lily	<i>Hymenocallis littoralis</i>	Amaryllidaceae	Boat shaped	Sulcus, sulculate	Reticulate, clavate
22	Shona cabbage	<i>Cleome gynandra</i>	Capparidaceae	Spheroidal	Colporus, tricolpate	Strilate, regulate
23	Southern wood sorrel	<i>Oxalis dillenii</i>	Oxalidaceae	Spheroidal	Colpus, tricolpate	reticulate
24	Oleander	<i>Nerium oleandra</i>	Apocynaceae	Spheroidal, circular	Tetraporate	Psilate
25	Globe amaranth	<i>Gomphrena globosa</i>	Amaranthaceae	Spheroidal	Pantoporate	Microechinate, Lophate
26	Moon flower	<i>Datura stramonium</i>	Solanaceae	Spheroidal	Tricolpate, colpate	Strilate, regulate
27	Peregrina	<i>Jatropha integrerrima</i>	Euphorbiaceae	Spheroidal	No-aperture	Crotan pattern, calvate
28	Little Iron weed	<i>Cyanthillium cinereum</i>	Asteraceae	Spheroidal, circular	Tricolpate	Microreticulate
29	Royal flower	<i>Delonix regia</i>	Fabaceae	Spheroidal	Tricolpate	Reticulate
30	Yellow bells	<i>Tecoma stans</i>	Bignoniaceae	Spheroidal	Tricolpate, colpate	Reticulate
31	Tulasi	<i>Ocimum sanctum</i>	Lamiaceae	Rounded	Porate	Spiny ornamentation

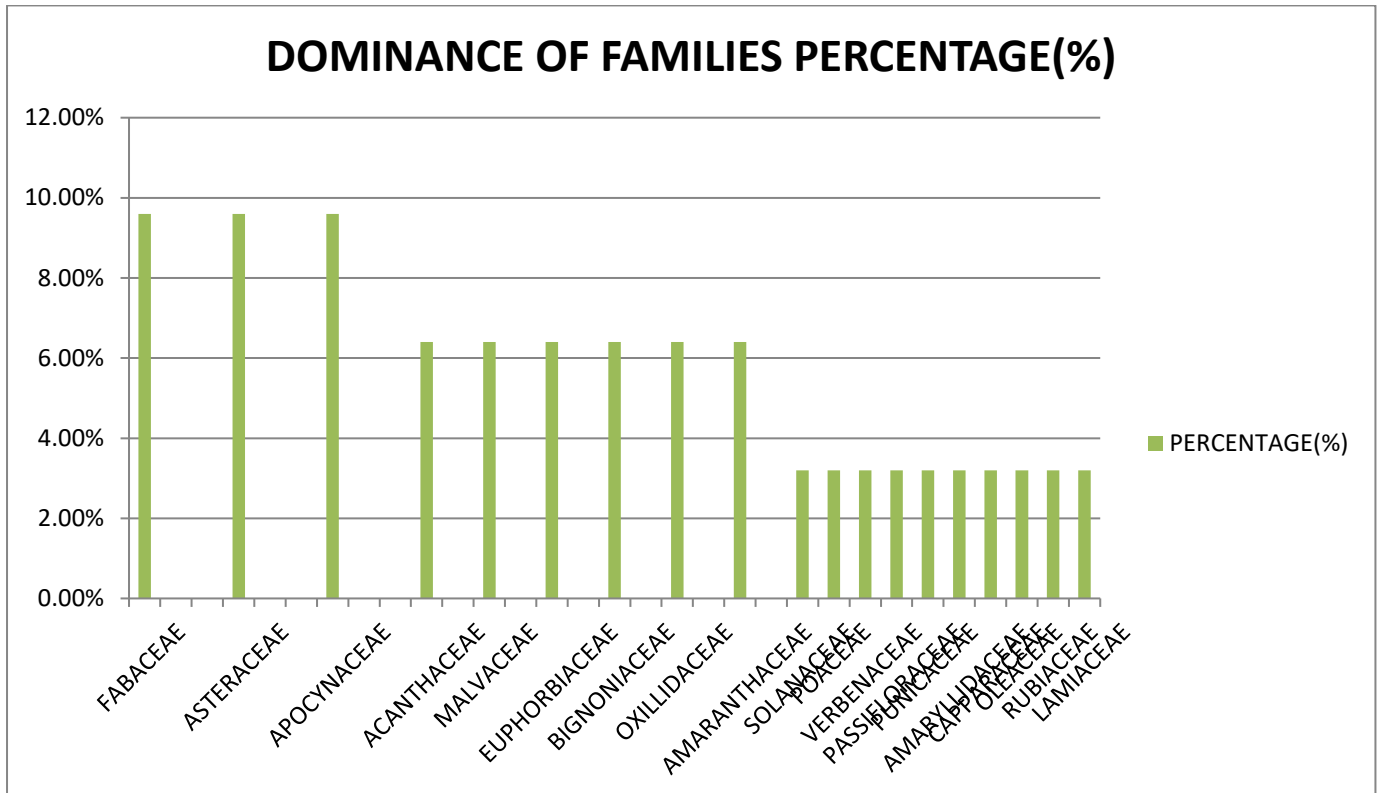
The present paper focused on pollen diversity in our college the survey conducted in July 2021 to March 2022. Total 31 palynotaxa belonging to 19 families. They are Fabaceae, Solanaceae, Asteraceae, Malvaceae, Poaceae, Apocynaceae, Verbenaceae, Nyctaginaceae, Acanthaceae, Rubiaceae, Oleaceae, Euphorbiaceae, Amaranthaceae, Bignoniaceae, Passifloraceae, Punicaceae, Amaryllidaceae, Cleomaceae &

Oxillidaceae, Lamiaceae. These palynologically investigated under light Microscope.

All the pollen grains characteristic features studied like Shape, Aperture, Ornmentation flowering season. The shape of the pollen grains varied from Porate to Oblate and Spheroidal. The plants with Spheroidal shape pollen *Catharanthus roseus*, *Lantana camara*, *Bougainvillea spectabilis*, *Tridax procumbens*,

Pseuderanthamum, Ixora coccinea, Jasminum sambac, Hibiscus rosa-sinensis, Pulmeria alba, Euphorbia heterophylla, Cynodon dactylon, Ghompherna celosoides, Hibiscus syriacus, Tecomaria capensis, Turnera ulmifolia, Punica grantum , Cleome gynandra, Oxalis dilenii, Nerium oleander, Ghompherna globosa, Datura stramonium, Jatropa integrerrima, Cyanthillium cinereum, Delonix regia, Tecoma stans .

The plants with Symmetrical pollen is Parthenium hysterothorus. The plant with Irregular pollen shape is Callaindra. The plants with Cylindric pollen shape Bauhinia racemosa, Crossandra infundibuliformis. The plant with Boat shaped pollen is Hymencallis littoralis.



The above table describes about the Dominance of the families among those collected 31 plants in our field work. The 31 plants are belongs to the different families, like Fabaceae, Solanaceae, Acanthaceae, Lamiaceae, Amaryllidaceae, Verbenaceae, Oleaceae, Rubiaceae, Capparaceae, Passifloraceae, Poaceae, Asteraceae, Apocyanaceae, Punicaceae, Oxillidaceae, Bignoniaceae, Malvaceae, and Euphorbiaceae. If we observe the table among those families Fabaceae, Asteraceae, Apocyanaceae are the Families showed equal Dominance over other families, and the dominant percentage of those families is 9.6%. and the families with medium dominance in those 31 plants were placed in the 2nd place of the table, they are

Acanthaceae, Euphorbiaceae, Malvaceae, Amaranthaceae, Oxillidaceae, and Bignoniaceae. The families showed the dominance percentage about 6.4%. and the remaining families were showed least dominance among 31 plants, they are Solanaceae, Poaceae, Verbenaceae, Amaryllidaceae, Punicaceae, Oleaceae, Rubiaceae, Lamiaceae, Passifloraceae and Capparaceae. These families showed the dominant percentage about 3.2%. As per our observation the plants with 6.4% dominance are in highest number in those collected 31 plants.

IV. CONCLUSION

The present study shows that the area which in few floral species. In that Fabaceae, Asteraceae, Apocynaceae are dominant species. In the study area Callaindra, Bauhinia racemosa, Delonix regia, Parthenium hysterophorus, Tridax procumbens, Cyanthillium cinereum, Catharanthus roseus, Pulmeria alba, Nerium Oleander. They release more pollen grains in seasonal. Less dominant families are Solanaceae, Poaceae, Verbenaceae, Nyctaginaceae, Rubiaceae, Oleaceae, Passifloraceae, Punicaceae, Amaryllidaceae, Capparidaceae, Oxillidaceae, Lamiaceae. In study area Datura stramonium, Cynodon dactylon, Bougainvillea spectabilis, Ixora coccinea, Jasminum sambac, Turnera ulmifolia, Punica grantum, Hymencallis littoralis, Cleome gynandra. They are also release pollen grains seasonally. Among 19 families 18 are Dicots, and only 1 is Monocot. Result from our study showed that great variation in shape, aperture, ornamentation. (showed in table 1).

In our result some pollen grains are causing allergies, respiratory problems by Parthenium hysterophorus, Euphorbia heterophylla etc. Therefore their concentration in the air may be the free disposing factors for causing allergy in sensitive individuals. These data may help to study the individuals phases of allergy. these pollen taxa may be help in to know the pollen taxa of Kamareddy dist.

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VI. REFERENCES

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