

Item no. 15.

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Jt. Registrar



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From: The Jt. Registrar
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Sub: Grant of Registration as a candidate for Ph.D. degree in
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To: Shri/Sm. Pritha Bhattacharya (Sasmal)
C/o - Ramapada Sasmal
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Sir/Madam,

I am to inform you that the Faculty Council for Post-graduate Studies in Arts etc/Science at its meeting held on 25.3.14 permitted you to get yourself registered as a candidate for Ph.D. degree, mentioned above, the title of your thesis being, "ATMOSPHERIC POLLEN INCIDENCE IN THE

BRAMBAGH SUBDIVISION OF HOOGHLY DISTRICT, WEST
CHENGAL

Subject to fulfillment of the requirements set forth in the University Ordinances relating to Doctoral Degrees and such terms and conditions as may be laid down by the appropriate authorities of the University from time to time.

You will now be required to deposit the Ph.D. Registration fee of Rs. 2,000/- along with part-time research fee of Rs. 4,000/- (Total Rs. 6,000/-) for enrolment of your name in the Register of candidates for Ph.D. degree, positively within a month from the date of issue of this letter, failing which your case will not be considered for Registration as a Ph.D. candidate.

In this connection you are requested to note that —

- a) You will be required to get yourself registered as a student of this University on migration after completing all the necessary formalities prescribed in this behalf, unless you are already a registered student of this University.
- b) On enrolment, you will be required to deliver one seminar talk before submission of the thesis pertaining to the project of your research you have undertaken within the period of your research work and before submission of the thesis.
- c) You will have to published at least one research paper related to your research work in a referred journal / peer reviewed journal / journal having ISSN or in a book having ISBN number before submission of the thesis and produce evidence for the same in the form of acceptance letter or the reprint at the time of submission of your thesis.
- d) You have been permitted to do research work under Dr. J. K. Pal, Asso. Prof

B. Botany, Netaji Mahavidyalaya, Brambagh

as your Supervisor / Joint Supervisors.

e) You will have to submit your thesis within six years from the date of your registration for Ph.D. degree mentioned above, but not earlier than 22.3.15 in the prescribed manner along with the fee of Rs. 4,000/- Or as may be fixed by the Executive Council from time to time towards submission of thesis.



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Manuscript acceptance

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Pollen morphological study of some plant taxa from Arambagh region of Hooghly District, West Bengal, India

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Abstract

The pollen morphology and exine structure of some plant taxa growing in the area of Arambagh of Hooghly District, West Bengal, India were studied using light microscopy during the period of September 2012 to February 2013. The pollen grains of *Alstonia scholaris*, *Thevetia purpurea*, *Plumeria alba*, *Catharanthus roseus*, *Tabernaemontana divericata*, *Moringa oleifera*, *Carica papaya*, *Mangifera indica* are 3-colporate type. The pollen grains of *Nerium odoratum* are 5-porate type and in *Brassica campestris* it is 3-porate type. The endangered plant *Rauwolfia serpentina* reveals 3-colpate type of pollen grain. The polyad type of pollen grains consisting of 12 cells is observed in *Acacia auriculiformis*. The flowering period of the investigated taxa are recorded. The opening of the flower of *Catharanthus roseus* is observed. The pollination of this plant is nocturnal as the flowers of these plants blossoms at evening 6.30 pm-7.00 pm. The aim of the present investigation is to study different pollen parameters such as shape, size, colpa and exine ornamentation for the taxonomic assessment of the groups of plants.

Keywords: pollen, taxonomic assessment, opening of flower

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Introduction

Now a days study of pollen is an important area of research. Various pollen morphological features such as asymmetry, shape, apertural pattern and exine configuration are very conservative features for the taxonomic assessment of the plants (Perveen, 2006; Bera et al., 2007; Koshavarzi et al., 2012). Moreover, some plants growing in the surroundings causes respiratory troubles or allergy in human beings (Singh and Kumar, 2004; Chauhan and Goyal, 2006). There are many plants in the Arambagh regions of Hooghly district, West Bengal such as rice, mustard, coconut, grasses, *Alstonia scholaris*, *Moringa oleifera*, *Carica papaya* etc., the pollen grains of which are responsible for allergy. Keeping in view the sufferings of

the people due to allergic disorders in this district primarily detailed pollen morphological study of some plants growing in Arambagh region of Hooghly district during the period of September 2012 to February 2013 was undertaken.

Materials and Methods

The mature flowers of some plant taxa growing around Arambagh region of Hooghly District during the period of September 2012 to February 2013, such as *Alstonia scholaris*, *Thevetia purpurea*, *Plumeria alba*, *Catharanthus roseus*, *Tabernaemontana divericata*, *Moringa oleifera*, *Carica papaya*, *Mangifera indica*, *Nerium odoratum*, *Brassica campestris*, *Rauwolfia serpentina* and *Acacia auriculiformis* were collected and

pollen morpho types studied following acetolysis method (Erdman, 1952). The anthers of the collected flowers were washed in 70% alcohol in a centrifuge tube and it was centrifuged for 5 mins at 2500 rpm. Water was decant off and acetolysis mixture (9 parts acetic anhydride and 1 part conc. H_2SO_4) added slowly to the residue sample. It was kept in hot water bath at 80°C for 2-3 mins. It was then centrifuged again for 20 mins. After centrifugation the residue sample was mounted in glycerine jelly. Relative humidity and temperature of the month was recorded with the help of hygrometer and thermometer. To study the opening of flower of *Catharanthus roseus* a good number (100) of healthy flower buds was observed throughout day and night for confirming the period of blooming of the flower. The microphotographs of the pollen grains were taken in a microscope (Make-Olympus and Model-CX21i and number 12M268). The measurement of the pollen grains were taken with the help of an Ocular Stage Division (Erma) and the measuring unit converted into μm (micromicron). The terminology of pollen is in accordance with Bhattacharya et al. (2009), Erdman (1952), Faegri and Iversen (1964), Kremp (1965), and Moore and Webb (1978).

Results

Flowers of different plant taxa growing in the Arambagh region was collected during the period of September 2012 to February 2013 (Fig. 1). The flowering period of the investigated taxa was recorded (Table 1). The temperature (°C) and humidity (%) of the said period was also recorded (Table 2). The pollen morphology of the investigated taxa was studied critically. Out of twelve genera studied, 3-colporate type of pollen grains were observed in *Alstonia scholaris*, *Thevetia purpurea*, *Plumeria alba*, *Catharanthus roseus*, *Tabernaemontana divericata*,

Moringa oleifera, *Carica papaya* and *Mangifera indica* (Table 3; Fig. 2). The pollen grains of *Nerium odoratum* are 5-porate type, where as the grain is 3-porate type in *Brassica campestris*. The endangered plant *Rauwolfia serpentina* reveals 3-colpate type of pollen grain. The polyad type of pollen grains consisting of 12 cells is observed in *Acacia auriculiformis*. The shape of the grains, exine ornamentation, length of colpa, diameter of pore, exine thickness and the value (PA/EDX100) for determining the shape of the grains are given below in Table 3.

Table 1. Flowering period of the investigated taxa (A- Apocynaceae, M-Mimosaceae, Mo-Moringaceae, C- Caricaceae, B-Brassicaceae, An-Anacardiaceae, T- thorough out the year)

Name of the Plants	Common name	Family	Flowering period
<i>Alstonia scholaris</i>	Chatim	A	Sep-Jan
<i>Thevetia purpurea</i>	Kolkae	A	T
<i>Plumeria alba</i>	Katgolap	A	Nov-Mar
<i>Nerium odoratum</i>	Karobi	A	Nov-Mar
<i>Catharanthus roseus</i>	Nayantara	A	T
<i>Tabernaemontana divericata</i>	Tagar	A	T
<i>Rauwolfia serpentina</i>	Sarpagandha	A	Sep-Dec
<i>Acacia auriculiformis</i>	Sonajhuri	M	Sept-Dec
<i>Moringa oleifera</i>	Sajnae	Mo	Jan- Mar
<i>Carica papaya</i>	Papaya	C	July-Oct
<i>Brassica campestris</i>	Mustard	B	Dec-Jan
<i>Mangifera indica</i>	Mango	An	Feb-Mar

The pollen sample i.e. anthers of collected flowers was acetolysed for clear observations of exine layers. Different parameters of the pollen grains like colpa, exine ornamentation etc. were determined comparing acetolysed grains. Microphotographs were taken of the acetolysed grains (Fig. 2) by light microscopy. To observe the opening of flower of *Catharanthus roseus*, 100 plants having flower buds were tagged with proper label and opening or

