

POLLEN MORPHOLOGY OF SELECTED CROP PLANTS FROM GONDPIPARI TAHSIL OF CHANDRAPUR DISTRICT OF MAHARASHTRA

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ABSTRACT

The pollen morphology of *Gossypium hirsutum* of family Malvaceae, *Capsicum annum* of family Solanaceae and *Sesamum indicum* of family Pedaliaceae have been examined by light microscopy and scanning electron microscopy. Light microscopy was done before and after acetolysis. The acetolysis was done by following the Erdtman method. The pollen grains size was measured, and by SEM, sculpture and ornamentation were observed. The size of the pollen grain was observed as 13.10µm, 6.1µm, 5.09µm. and exine apertures are Pantaporate Echinete, Angulaperturate reticulate, Stephanocolpate Scabrate respectively.

Key words: pollen morphology, crop plants, palynology.

Introduction

Palynology is the study of pollen grains and spores. The term palynology proposed by Hyde & William (1945) at first. Pollen grains are present in various kinds of variety of shapes with complex surface sculpture and occur on most surface in nature. (Agashe 2006). pollen characteristics are used in taxonomic studies based on their exine pattern, sculpturing, aperture, pore characters, shape or size (Saensouk and Saensouk 2020, 2021b). Palynological studies is helpful in solving taxonomic problems and now a days it is playing an important role in daily life. It is useful in forensic science, melissopalynology, in genetic studies, community and

climate change studies. it is also used in the field of agriculture, archaeology, forestry, and plant geography. Pollen study has a significant application in the recognition of bee plants.

Materials and Methods

Field studies

In the present investigation, the pollen morphology of three plant species from three families has been identified and studied during 2021-2022. In a field survey of different places in the Gondpipari tahsil of Chandrapur district in Maharashtra. The sample of ripe pollen grains was collected from mature flower directly from the field and preserved in 70% alcohol for further investigation.

Preparation of pollen slides

The preserved material was processed by acetolysis method according to Erdtman (1960) for light microscope, which involves the introduction of an acetolysed mixture which contains acetic anhydride and concentrated sulfuric acid in the ratio 9:1. The tubes were immersed in a heat block for 3-5 minutes. Centrifuged and washed with glacial acetic acid. Then, about few drops of saffranine and glycerin was added and mounted on a slide. the prepared slides were studied under a light microscope for morphological studies, and a photograph of a pollen grain was taken.

For SEM, dried pollen grain material was fixed and dehydrated, then mounted on appropriate metal stubs and sputter-coated with gold and the sculpture and ornamentation of the pollen grain. The exine sculpturing, spine, pattern, aperture, pore characters, size, or shape of the three species were studied under light microscopy and scanning electron microscopy, respectively.

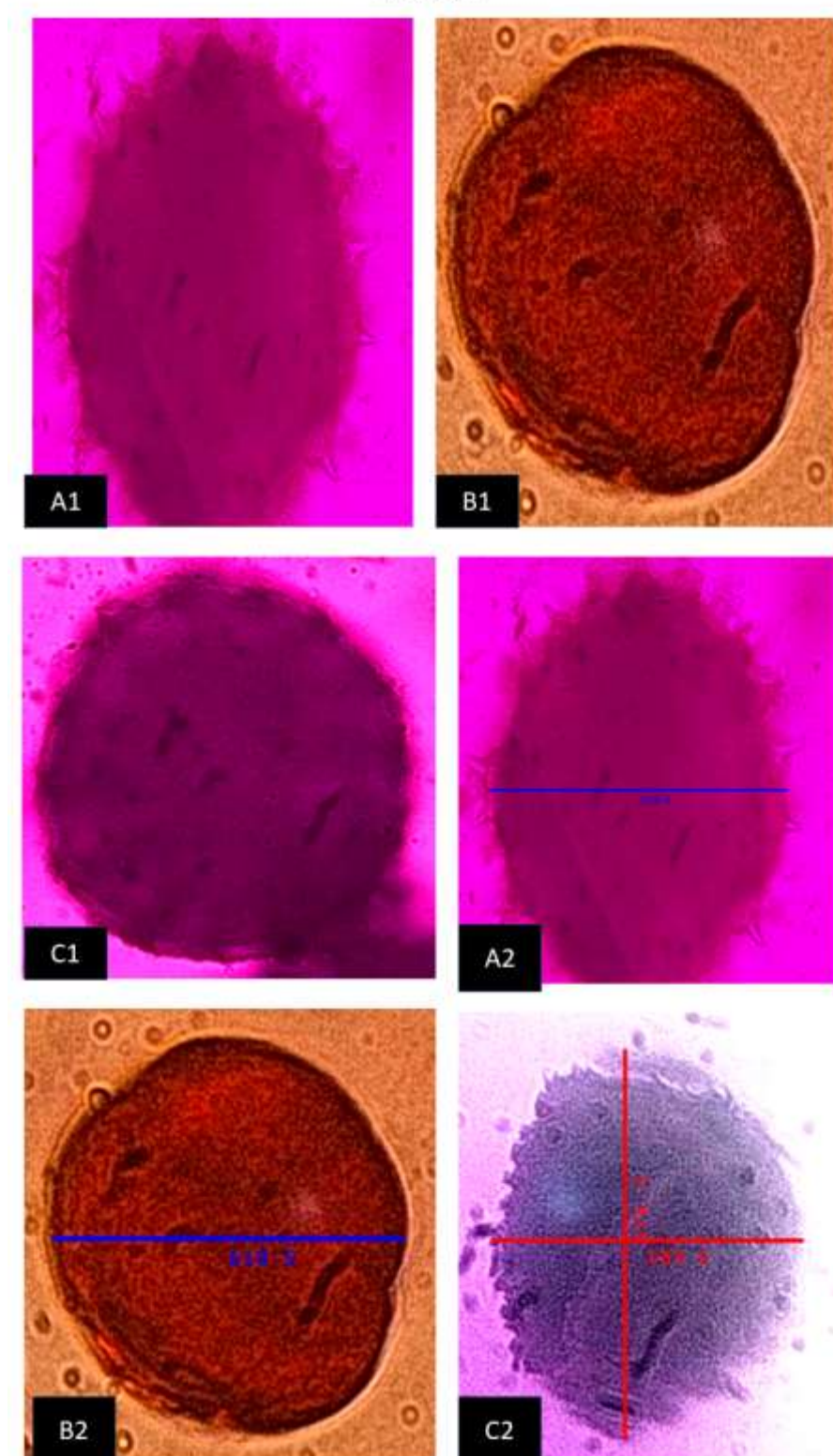
Observation and results

In palynological study of selected crop plants. i.e. *Gossypium hirsutum*, *Capsicum annum* & *Sesamum indicum* are observed by LM and SEM and pollen grain size are 13.10 μ m, 6.1 μ m and 5.09 μ m & Exine sculpture are Pantaporate, Echinete, Angulapertureate, Reticulate, Stephanocolpate, Scabrate. respectively. And the results are reported in Table No. 1 and Plates No. 1&2.

Observation table no. 01

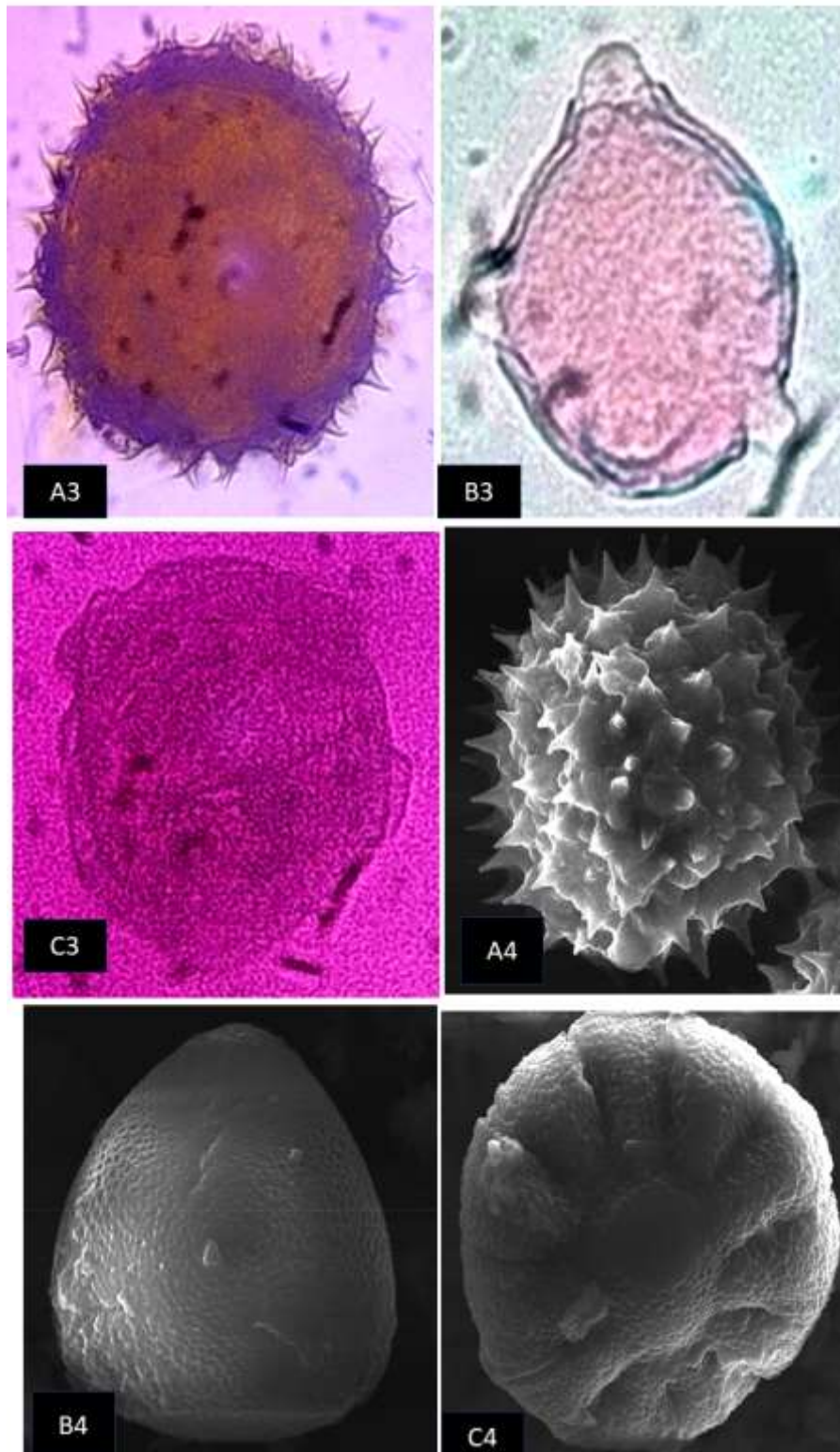
Sr. no.	Species	family	Species locality	Size (μ m)	Shape	Aperture character
01	<i>Gossypium hirsutum</i>	Malvaceae	Gondpipari tahsil of Chandrapur (MS)	13.10	Circular	Pantaporate Echinete
02	<i>Capsicum annum</i>	Solanaceae	Gondpipari tahsil of Chandrapur (MS)	6.1	Triangular	Angulapertureate Reticulate
03	<i>Sesamum indicum</i>	Pedaliaceae	Gondpipari tahsil of Chandrapur (MS)	5.09	Convex	Stephanocolpate Scabrate

Plate 1



A1: *Gossypium hirsutum* (LM without acetolysis); B1: *Capsicum annum* (LM without acetolysis); C1: *Sesamum indicum* (LM without acetolysis); A2: *Gossypium hirsutum* (measured); B2: *Capsicum annum* (Measured); C2: *Sesamum indicum* (Measured)

Plate 2



A3: *Gossypium hirsutum* (LM acetolysed); B3: *Capsicum annum* (LM acetolyses); C3: *Sesamum indicum* (LM acetolyses); A4: *Gossypium hirsutum* (SEM); B4: *Capsicum annum* (SEM); C4: *Sesamum indicum* (SEM)

Conclusion and Discussion

Pollen morphology has played an important role in solving taxonomic problems. the findings of this study indicate that the descriptive features of pollen morphology of the family Malvaceae are characterized as Pantaporate Echinata, while the family Solanaceae exhibits Angulaperturate reticulate morphology. Additionally, the pollen morphology of the family Pedaliaceae is identified as Stephanocolpate Scabrate.

References

- Hyde, HA and Williams, 1945. Palynology. Nature, 55:265.
- Rukhshinda, A and Anjum, P., 2006. A palynological study of some cultivated trees from karachi. Pak. J. bot., 38(1): 15-28.
- Erdtman, G.,1960. The acetolysis method- A revised description. In svensk. Bot. tidskr., 54: 561-564.
- Shubharani, R., Roopa,P. & Sivaram, V., 2013. Pollen morphology of selected bee forage plants. Gjjbb., vol.2(1) 82-90.
- Saensouk S, saensouk P. 2020. Pollen morphology of helicteres (malvaceae s.l.) from Thailand. Agric nat resour 54:351-354.
- Saensouk S, saensouk P. 2021b. pollen morphology of subfamily malvoideae (malvaceae sensu lato) in Thailand. Biodiversitas 22 (12): 5633-5643. DOI: 10.13057/biodiv/d220844.
- Agashe, S.N.2006. Palynology and its applications.