

Pollen characteristics of clove (*Syzygium aromaticum* (L.) Merr. & Perry)  
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INTRODUCTION

The clove of commerce comprises of unopened flower buds of the clove tree, *Syzygium aromaticum* (L.)Merr. & Perry belonging to the family Myrtaceae. The genus *Syzygium* encompasses a large number of species of which *Syzygium aromaticum* (L.) Merr. & Perry is the only commercialized aromatic spice. Clove has been employed for centuries as food preservative and as medicinal plant because of its antioxidant and antimicrobial activities. Morphological characteristics of pollen grains are useful characters as many pollen traits are influenced by the strong selective forces which are involved in reproductive processes including pollination, dispersal, and germination (Moore *et al.*, 1991). The study of pollen grains of clove is meager and hence morphological observations of clove pollen grains was undertaken.

MATERIALS AND METHODS

The study of various characteristics of cove was carried out in the College of Agriculture, Vellayani from 2018-2020. As part of studying the floral biology of clove, pollen characteristics were also observed. For pollen morphology studies, the anthers were collected from the buds which was expected to open after 12 hour and was preserved immediately in 70% ethanol. Slide preparation for pollen morphology studies were made by acetolysis method proposed by Punt (1967). The preserved material of anthers were transferred to a centrifuge tube and crushed with a glass rod. The dispersion was sieved through a brass mesh of 48 divisions cm<sup>2</sup> and was collected in a glass centrifuge tube. After centrifugation in centrifuge at 2000 rpm for 5 minutes, the supernatant was decanted and the pollengrains after washing in glacial acetic acid was treated with acetolysis mixture consisting of acetic anhydride and concentrated sulphuric acid (9:1) in the centrifuge tube. A glass rod was placed in each tube and was transferred to a water bath at 70-100°C for 3 to 5 minutes, till the medium became brown in colour. Centrifugation of this mixture was carried out in centrifuge at 2000 rpm for 5 minutes and the supernatant was decanted off and glacial acetic acid was added to the sediment and again centrifuged and supernatant was decanted. A drop of the sediment was placed on the glycerine medium in the centre of the slide and covered by a coverslip. The permanent slide prepared was taken for observation of pollen shape, pollen size, viable and nonviable pollen using Scanning Electron Microscope of Sophisticated Instrumentation and Computation Centre, University of Kerala, Karyavattom, Thiruvananthapuram.

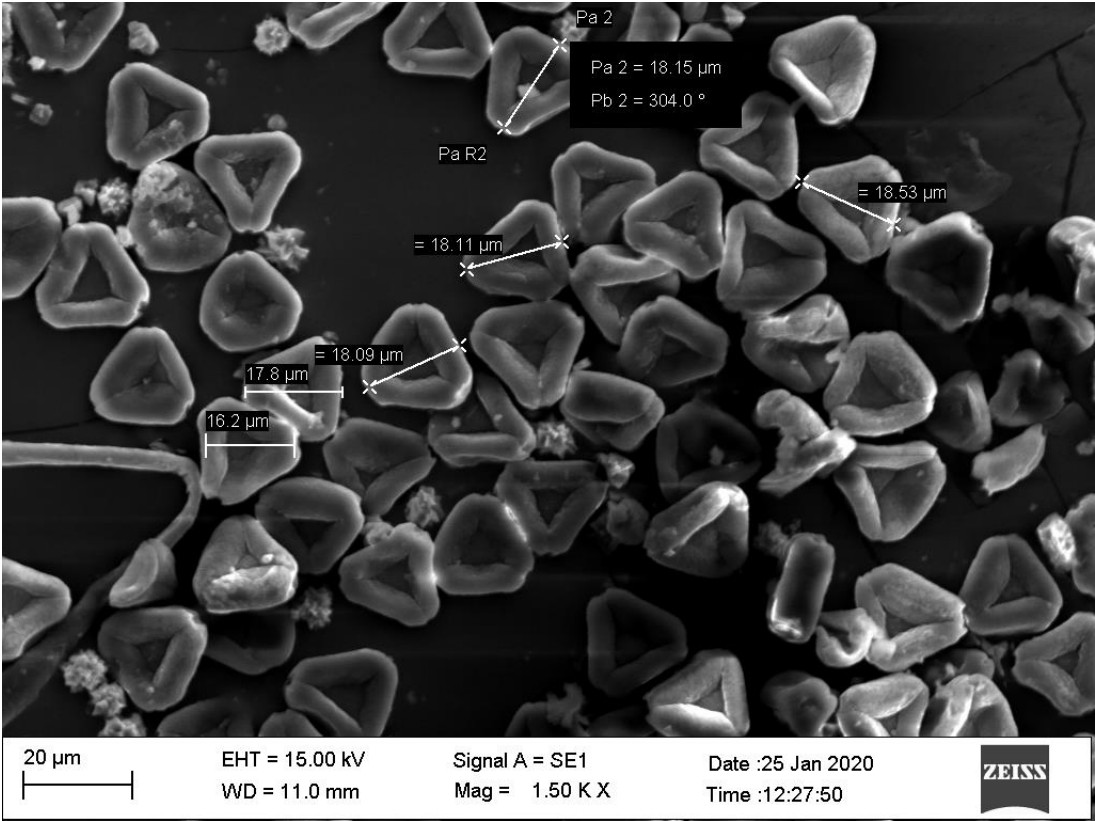
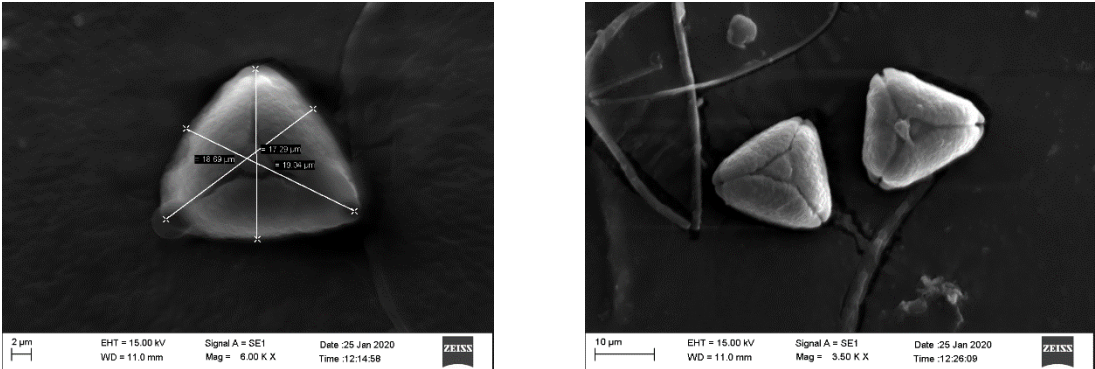
RESULTS

The pollen morphology studied using Scanning Electronic Microscope is presented in Figure 1. The pollen grains were monad, radially symmetrical, triangular, trizonosyncolporate and were having exine ornamentation. Polar and equatorial axis of pollen grains of clove is depicted in Table 1. The polar diameter of pollen grain ranged from 17.06-18.22 µm and the equatorial diameter of pollen grain ranged from 19.40-20.70 µm.

Table 1. Polar and Equatorial axis diameter of five pollen grains of clove

Sl. no	Polar axis diameter (µm)	Equatorial axis diameter (µm)
1	17.24	20.12
2	17.06	19.40
3	18.22	20.70
4	18.15	20.10
5	17.29	20.30
Mean	17.59	20.12

Figure 1: Pollen morphology using Scanning Electron Microscope



REFERENCES

Moore, P.D., Webb, J.A., and Collison, M.E. 1991. *Pollen analysis*. Blackwell scientific publications, Oxford.

Parnell, J. 2003. Pollen of *Syzygium* (Myrtaceae) from South East Asia, especially Thailand. *Blumea-Biodivers. Evol. Biogeography Plants* 48(2): 303-317.

Punt, W. 1967. Pollen morphology of the genus *Phyllanthus* (Euphorbiaceae). *Rev. Palaeobotany Palynology* 3(1-4): 141-150.