

CYTOPLASMIC-FERTILE VERSUS -STERILE POLLEN: A MORPHOLOGICAL COMPARISION

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Abstract

Light and electron microscopes were used to investigate the difference between cytoplasmic-fertile and sterile pollen of tobacco (*Nicotiana tabacum*), sesame (*Sesamus indicum* L.) and barley (*Hordeum vulgare* L. cv. Baegdong). It was found that two distinct types of pollen could be seen: a smaller, irregular in shape, transparent type (cytoplasm-devoid) and a larger, normal shaped, dark type (cytoplasm-rich). Furthermore, Alexander's stain showed that three of the plant species studies had two distinctive types of pollen; one stained dark i.e. cytoplasm-rich and other did not stain i.e. cytoplasm-devoid. These results suggest that cytoplasmic-sterile pollen was undersized and lack of cytoplasm probably due to abortion or other factors and the use of light and electron microscope can rapidly screen pollen fertility, which would allow appropriate management strategies during collection and pollination strategies.

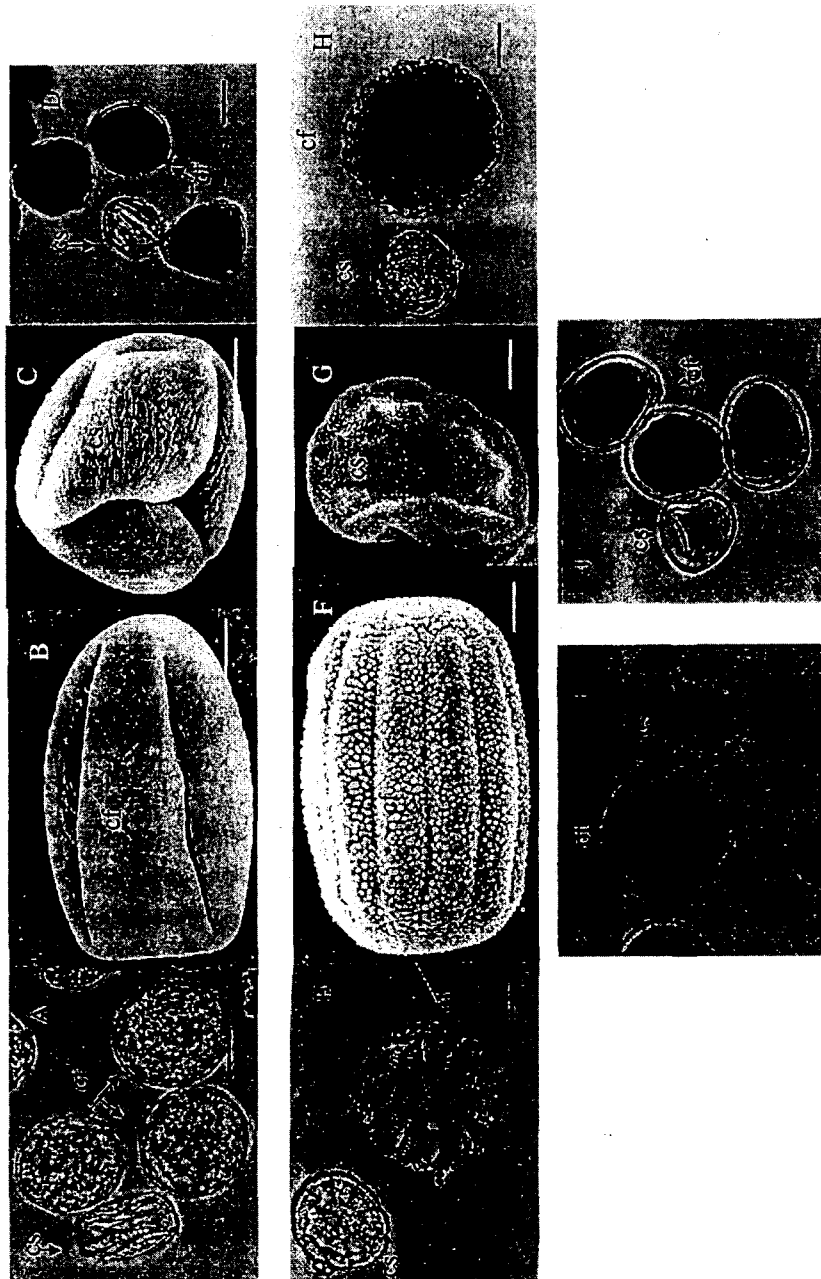


Fig. 1. Light and scanning electron micrographs of cytoplasmic-sterile (cs) and -fertile (cf) pollen of tobacco (*Nicotiana tabacum*), (A-D), sesame (*Sesamus indicum* L.) (E-H) and barley (*Hordeum vulgare* L.) (I-J). One can see smaller, irregular shaped and transparent (cytoplasm-sterile) (cs) and large and regular shaped (cytoplasmic-fertile) (cf) pollen. Light micrographs (A, E, I - bars: 10, 5, 10 μ m respectively) and SEM micrographs (B, C, F, G - bars: 10, 10, 10 μ m respectively). (D, H, J) Alexander's stained - cytoplasm-devoid pollen did not stained while cytoplasm-rich pollen stained dark (bars: 10, 5, 10 μ m respectively).