

# EXPERIMENTAL STUDIES ON THE FUNGUS RELATIONS OF CITRUS POLLEN GRAINS

INQUIRY into the fungus-pollen relationships has come into prominence in recent years with the finding that pollen grains have a stimulating influence on the incidence of fungal diseases, during the post-flowering period of crop plants<sup>1</sup>. Thus, an understanding of the fungus-pollen association is of practical application in the prevention and control of plant diseases.



FIGS. 1-2. Fig. 1. The fungus *Alternaria* growing on *Citrus* pollen ( $\times 700$ ). Fig. 2. Fungal hyphae cultured from the uredospores of *Ustilago* 'infecting' the pollen of *Citrus*: Note the path of hyphae inside the pollen ( $\times 428$ ).

Nair and Khan<sup>2</sup> observed that the fungus *Alternaria* infect the pollen grains of *Schizanthus pinnatus*

producing sterility in those pollen. It was also observed that the fungal hyphae enter the pollen grains through germinal apertures, traverse along the inner periphery of the pollen wall, and probably obtain nutrition from the protoplasm by means of haustorial processes. The present investigation has mainly been done to understand and to experimentally produce the above state.

Mature pollen grains of *Citrus* were dusted on moist filter-paper and placed in a petridish containing a thin film of water. The petridish was kept on the window sill with the intention of producing fungal infection by means of airborne spores. The filter-paper was kept moist whenever it got dry. After 10 days visible signs of infection were noticed. A pellet of glycerine jelly was taken at the end of a needle, warmed over a flame and the infected pollen was picked up from the filter-paper. The jelly with the infected pollen was placed on a slide, warmed and covered by a cover glass, and sealed with paraffin wax for examination.

In another experiment the pollen grains of *Citrus* and the uredospores of *Ustilago* (collected from infected heads of the grass *Cynodon dactylon*) were sown together in 35% sucrose solution contained in 5 ml beakers and was kept suitably covered. After 10 days there was a visible growth of the fungus which along with the pollen was drawn out from medium by means of a brush, placed on a slide, spread, and mounted in glycerine jelly.

It was observed in both experiments that the fungal hyphae entered the pollen grains and wound its way either along the periphery (Fig. 1) or through the centre of the protoplasmic mass (Fig. 2). In the case of infection of pollen by *Alternaria* it was noticed that the pollen was clearly used as a substratum for the growth of the fungus as seen in Fig. 1.

Apart from projecting the phenomenon of fungal parasitism on pollen the present study has served to indicate the possibility and advantage of maintaining fungal cultures fed on pollen nutrients.

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