

Note on pollination in *Ficus religiosa* L.\*

by

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Pollination in *Ficus religiosa*, as connected with the structure and mode of action of the pollen pockets of *Blastophaga quadraticeps* Mayr, the legitimate pollinator, was studied in trees grown in the Botanical Garden of Tel-Aviv University. The wasp *B. quadraticeps* possesses two thoracic pockets in which pollen is stored for subsequent introduction into the young figs. Pocket loading takes place in the nearly ripe figs, at their male phase. The impregnated female wasps leave their galls, approach the ripe anthers, and load the pockets by very swift movements of the forelegs. Then they leave the fig via narrow tunnels bored by the male wasps. Upon entering young receptive figs (female phase) the female wasps begin oviposition, during which pollen emptying and pollination take place.

The pollen pockets of *B. quadraticeps* are complex and highly specialized structures rather than mere depressions or folds of the body wall. They are small sac-like organs, about  $100 \times 110 \mu$  in size, on both sides of the mesosternum, with well defined openings. The main entrance is located at the inner border of the pocket (R in Figs. 1, 2 and 3). In the resting position the pocket is closed; it opens widely when the adjacent sternite is touched parallel to its inner border (T—T in Figs. 1 and 2) and closes shortly afterwards. Two additional narrow exits ( $25 \mu$ ) occur at the inner anterior and inner posterior corners of the pockets (B and A, in Figs. 1, 2 and 4).

Loading of the pocket is achieved by two separate actions which follow each other: the forelegs transfer the pollen from the open anther to the underside of the mesothorax close to the inner border of the pocket (T—T in Figs. 1 and 2) and then the pollen is absorbed by some inherent mechanism of the pocket itself by way of the wide entrance which is laid open at the touch of the legs. Accordingly, by touching the mesosternite at the proper place empty pockets may be loaded artificially with various small foreign particles that are deposited along the inner margin of the pocket. Thus treated small particles not exceeding  $40 \mu$  in diameter are instantly absorbed by the pockets and are fairly well seen within them in whole mounts and microtome sections. By this method the pockets of *B. quadraticeps* were loaded with spores of the fungus *Pisolithus tinctorius*, with starch grains or with iron particles. The proposed technique affords good means of studying the inner structure of the pocket. Especially iron particles which can be moved within the pocket with the help of magnetized needles, are a most promising material for such studies.

As yet, no satisfactory explanation can be offered as to what factors are involved in the opening of the pocket and the mechanism of pollen absorption.

\* Synopsis of the article "Pollination in *Ficus religiosa* L.", published by the same authors in the *New Phytologist* (1970) 69 : 775—84.

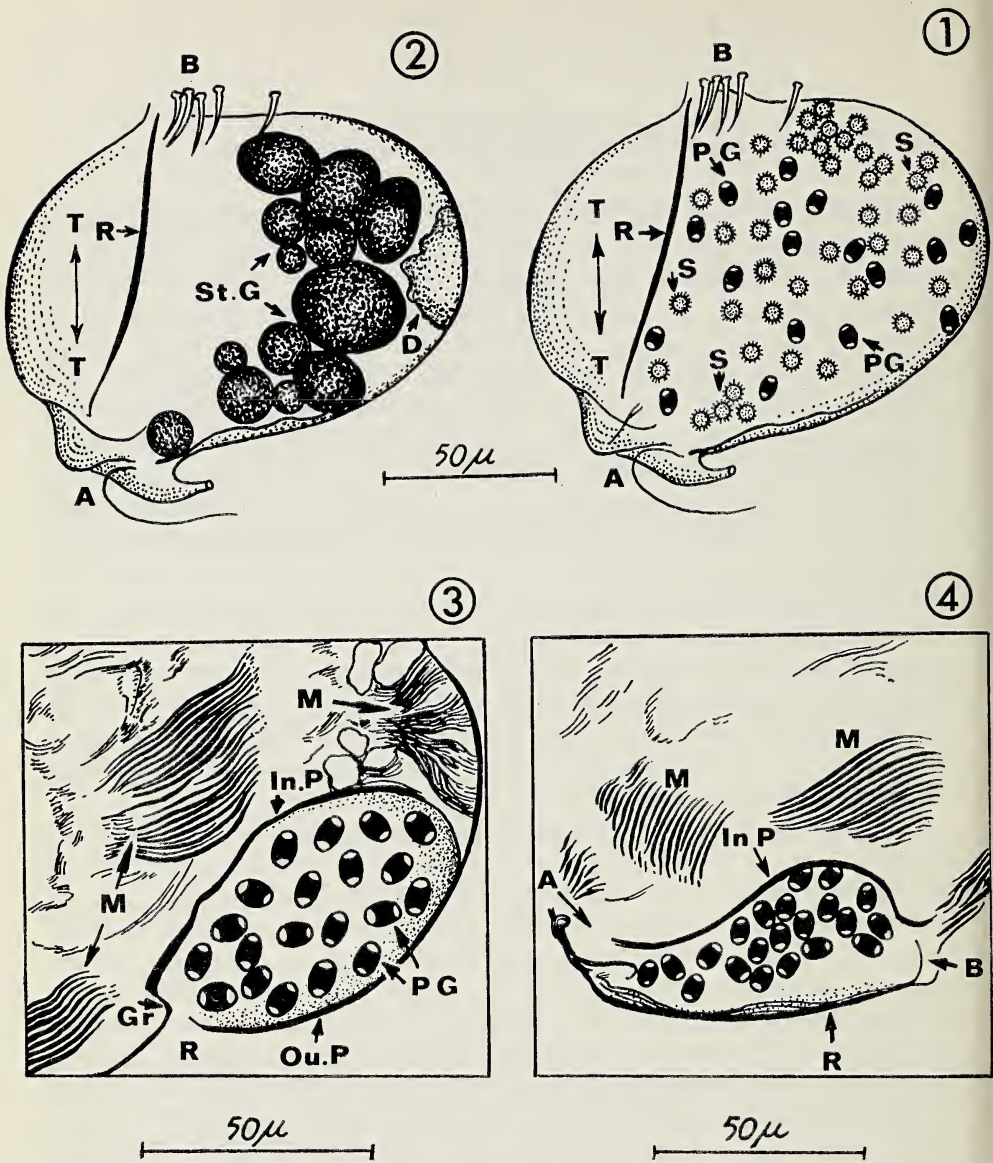


Fig. 1. Ventral view of pollen pocket (mesothrax whole mount) loaded with *Ficus* pollen grains (PG) and *Pisolithus* spores (S.) A, B, exits; R, entrance; T-T, site of triggering.  
 Fig. 2. Ventral view of pollen pocket, loaded with starch grains (St.G.). Explanations as in Fig. 1.

Fig. 3. Transverse section through a slightly open pollen pocket. In. P, inner plate; Ou. P, outer plate; R, entrance; Gr, groove; M, muscles; PG, pollen grains.

Fig. 4. Lower frontal section through pollen pocket. Explanations as in Fig. 3.