

rentiate into a distinct inner tapetal layer (figure 2). Initially, the tapetal cells are uninucleate but later they enlarge in size and become binucleate (figure 3). Concomitant with the differentiation of the outer tapetal layer, the connective cells, situated laterally at the two ends of horse shoe-shaped sporogenous cell plate also develop and join the outer tapetum with the inner one (figures 3 and 4). Thus, a continuous tapetum is organized but it has a distinct dual origin (figure 4). The cells of the inner tapetum are larger than those of the outer tapetum (figures 3-5). The cells of both the tapeta remain intact upto the uninucleate pollen grain stage (figure 6). The middle layer starts degenerating during the formation of microspore tetrads (figure 5). The endothelial cells elongate radially and tangentially and acquire characteristic fibrillar thickenings (figure 7). The epidermal cells become irregular in shape and develop a thin wavy layer of cutin on their outer walls at maturity of anther (figure 7). The development of anther wall corresponds to the dicotyledonous type.

The primary sporogenous cells by further divisions give rise to pollen mother cells which undergo meiotic divisions to produce tetrahedral (79%) and decussate (21%) types of microspore tetrads (figures 4 and 5). The cytokinesis is by furrowing. Degeneration of one to four microspores in an individual tetrad is observed (figure 5). Most of the pollen grains are non-viable (78%). The production of non-viable pollen grains has been associated with the delayed generation or hypertrophy of the tapetum³⁻⁶. The microspore nucleus divides asymmetrically to form a small generative cell and a large vegetative cell (figure 7). The pollen grains are triporate and shed at two-celled stage (figure 7). Dehiscence of the anther occurs at the junction of the pollen sacs. The endothelial cells at this region lack fibrillar thickenings and the epidermal cells are smaller in size.

Hypertrophied tapetum has not been reported in the members of the family studied so far⁷⁻¹⁴ except in *Plectranthus mollis* (sub tribe-Euocimeae, tribe Ocimoideae)¹⁵. Therefore the present taxon (tribe Stachydeae) shows affinity with *P. mollis* (tribe Ocimoideae) by having this unique character of the tapetum.

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RECORD OF NATURAL ENEMIES ON THE GRAPE MEALYBUG, *MACONELLYCOCCUS HIRSUTUS* (GREEN)

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THE grape mealybug, *Maconellicoccus hirsutus* (Green) has assumed the form of a major pest in all the grape-growing areas of South India¹. The report of the parasitoid, *Anagyrus dactylopii* (How) and a few undetermined species of predators is the only earlier record of natural enemies of *M. hirsutus* on grapevine². During the search for the natural enemies of *M. hirsutus* during 1984-86 in Karnataka, a total of six parasitoids namely, *A. dactylopii*, *Allotropa* sp nr *japonica* Ashm, *Gyanusoidea mirzai* (Agarwal), *Alamella flava* Agarwal, *Leptopilinia* sp and *Chartocerus* sp nr *Walkerii* Hayat, and seven predators viz *Scymnus* sp, *Scymnus coccivora* Ayyar, *Cryptolaemus montrouzieri* Muls, *Chrysopa*