cinate. Gleba and basidia not observed. Basidiospores 9–15 μm long 6–11 μm in diameter, ovoid or ellipsoidal, one-celled, hyaline, appendaged; at the apex provided with a single, slender, flexible, attenuate, hyaline appendage, 20–47 μm long, less than 1 μm in diameter, four (rarely 3 to 5) similar subterminal radiating appendages around the base, 20–32 μm long; at the point of attachment to the basidium with a short cylindrical projection.

Collection examined: M. F. M. no 43, on dead and decaying intertidal wood, Malvan, Maharashtra, October 12, 1981-Leg B. D. Borse.

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EMBRYOLOGY OF STEGNOSPERMATACEAE

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THE taxonomic placement of *Stegnosperma* is controversial. It was included in Phytolaccaceae by Bentham and Hooker[1] (as anomalous genus). Others[2–5] segregated it into a monogeneric family. Stegnospermataceae and placed it in the order Pittosporales in association with Pittosporaceae, Byblidaceae, Tremandraceae and Vivianiaceae. Dahlgren[6] also accorded it the status of an independent family but under the order Caryophyllales. Thorne[7], though initially treated it as a sub-family, Stegnospermatoideae under Phytolaccaceae, later[8] raised it to the status of an independent family. Embryologically, the genus *Stegnosperma* is unknown[9] and the present study is the first attempt in this regard on two species, namely *S. halimifolium* Benth and *S. watsonii* Rogers.

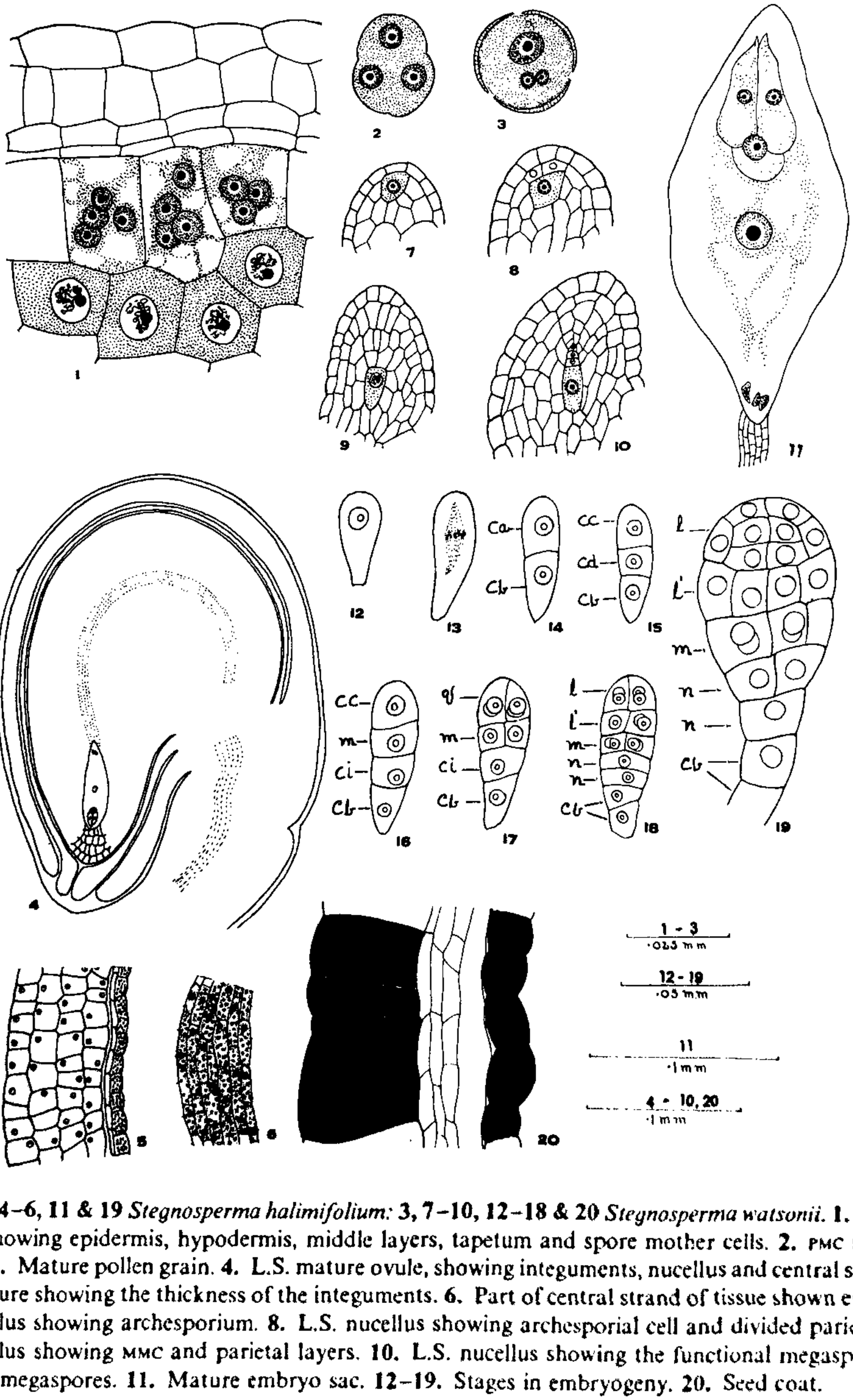
The differentiated anther shows an epidermis, hypodermis which develops into the fibrous endothecium, two middle layers which become pressed during the development of the anther, and secretory tapetum (figure 1). The tapetal cells become multinucleate by the time the pollen mother cells enter meiosis (figure 1) and become absorbed by the time the pollen grains are formed in the anthers. Cytokinesis of pollen mother cells takes place by furrowing method (figure 2). Pollen tetrads show tetrahedral arrangement. Ripe pollen are three-celled (figure 3).

The ovary is pentacarpellary syncarpous and pentalocular with one ovule in each loculus. The ovule is bitegmic and the integuments are free. The outer integument is four-cell thick and the inner two-cell thick on the antiraphe side (figure 5). However, in the apical region the outer and inner integuments are 7- and 3-cell thick respectively. Starch grains are present in the cells of the outer integument (figure 5). Dark granular bodies of unknown nature accumulate in the cells of the inner epidermis of the inner integument (figure 5). The microphyle is formed by the inner integument alone (figure 4). The archesporium in the ovule is hypodermal and single-celled (figure 7). It cuts off primary parietal cell before it functions as the megaspore mother cell (figure 8). The former undergoes periclinal and anticlinal divisions giving rise to three-to-five layered parietal tissue (figure 9). The embryo sac develops according to the Polygonum type. The egg apparatus consists of two hooked synergids, which show filiform apparatus and an egg. The polar nuclei fuse before fertilization. The antipodals show signs of early degeneration (figure 11).

As the embryo sac develops, a narrow 5–7 cell wide strand differentiates along the median line of the curved nucellus, the upper end terminating at the base of the embryo sac and the other at the chalazal end. The cells of this strand show deep staining vacuolate cytoplasm and are packed with starch grains (figures 4, 6) which are obviously concerned with the nutrition of the embryo sac. The lower end of the embryo sac elongates and grows into a caecum-like haustorium crushing the cells of the central strand and reaches the chalazal end of the ovule.

Fertilization is porogamous. Endosperm is of the nuclear type. The embryogeny conforms to the Caryophyllad type (figures 12–19) of Johansen. The seed is arillate. The seed coat is formed by the outer and the inner epidermal layers of the outer and inner integuments respectively and the cells are filled with deeply stained material (figure 20).

In embryological features such as glandular tapetum, multinucleate condition of tapetal cells, simultaneous cytokinesis of pollen mother cells, three-celled pollen, bitegmic crassinucellate ovules, endostome,



Figures 1, 2, 4–6, 11 & 19 *Stegnosperma halimifolium:* **3, 7–10, 12–18 & 20** *Stegnosperma watsonii.* **1.** Section of another showing epidermis, hypodermis, middle layers, tapetum and spore mother cells. **2.** PMC showing cytokinesis. **3.** Mature pollen grain. **4.** L.S. mature ovule, showing integuments, nucellus and central strand of tissue. **5.** Figure showing the thickness of the integuments. **6.** Part of central strand of tissue shown enlarged. **7.** L.S. nucellus showing archesporium. **8.** L.S. nucellus showing archesporial cell and divided parietal cell. **9.** L.S. nucellus showing MMC and parietal layers. **10.** L.S. nucellus showing the functional megaspore and degenerating megaspores. **11.** Mature embryo sac. **12–19.** Stages in embryogeny. **20.** Seed coat.

Polygonum type of embryo sac ontogeny, nuclear endosperm, Caryophyllad type of embryogeny and seed coat structure[9,10], *Stegnosperma* resembles Phytolaccaceae. Most of these features are also shared by Caryophyllaceae. *Stegnosperma*, though resembles Phytolaccaceae in anatomical characters, deviates in the anomocytic stomata and in the absence of anomalous secondary growth[11]. In pollen characters, morphological features like the presence of petals, antipetalous carpels, sieve-tube plastids, *Stegnosperma* are close to Caryophyllaceae than to Phytolaccaceae[12–14]. An important chemical character shared by Stegnospermataceae and Phytolaccaceae is the presence of betalains, which are absent in Caryophyllaceae. There is no information on the cytology of *Stegnosperma* for comparison with Phytolaccaceae and Caryophyllaceae.

Thus, in the light of the available data on *Stegnosperma*, it is tentatively suggested that the genus be raised to the status of an independent family and placed in the vicinity of Phytolaccaceae and Caryophyllaceae, as has also been suggested by Thorne (1983). It may also be pointed out that these data do not justify Hutchinson's (1973) inclusion of Stegnospermataceae in Pittosporales.

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OUTBREAK OF GIANT MEALYBUG, *DROSICHA STEBBINGI* (GREEN), IN WEST RAJASTHAN (HEMIPTERA: MARGARODIDAE)

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THE giant mealybug *Drosicha stebbingi* (Green, 1903) appeared in an epidemic form in and around Jodhpur, during the last week of July 1984. The bug infested mainly ber trees (*Zizyphus mauritiana*) and a local shrub *Prosopis juliflora*, but spread over other plants in the vicinity of the above preferred hosts (figures 1, 2).

This insect pest is well known as mango mealybug in North India and the present outbreak seems to be the western periphery of its range in the country. The bug

Figures 1, 2. 1. Outbreak of *Drosicha stebbingi* on *Prosopis juliflora* bushes, **2.** Heavy infestation on *Zizyphus mauritiana*.