

AN ASSURED *IN VITRO* TECHNIQUE FOR THE GERMINATION OF OOSPORES OF *PHYTOPHTHORA PALMIVORA* (BUTLER) BUTLER

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BLACK pepper wilt caused by *Phytophthora palmivora* (Butler) Butler MF₄ strain is a destructive disease in Malnad districts of Karnataka State, due to which most of the plantations are destroyed. The production and germination of oospore is an important event for the completion of life cycle of *P. palmivora*. The production of oospores of *P. palmivora* (Butler) Butler MF₄ strain from black pepper isolates from Malnad area, *in vitro* was successfully obtained¹. The present authors further confirmed the existence of both the mating types of *P. palmivora* (Butler) Butler MF₄ strain in the pepper gardens. The oospores were produced on cut leaf of black pepper² and carrot Agar medium. An attempt was made to germinate the oospores, the result of which are presented here.

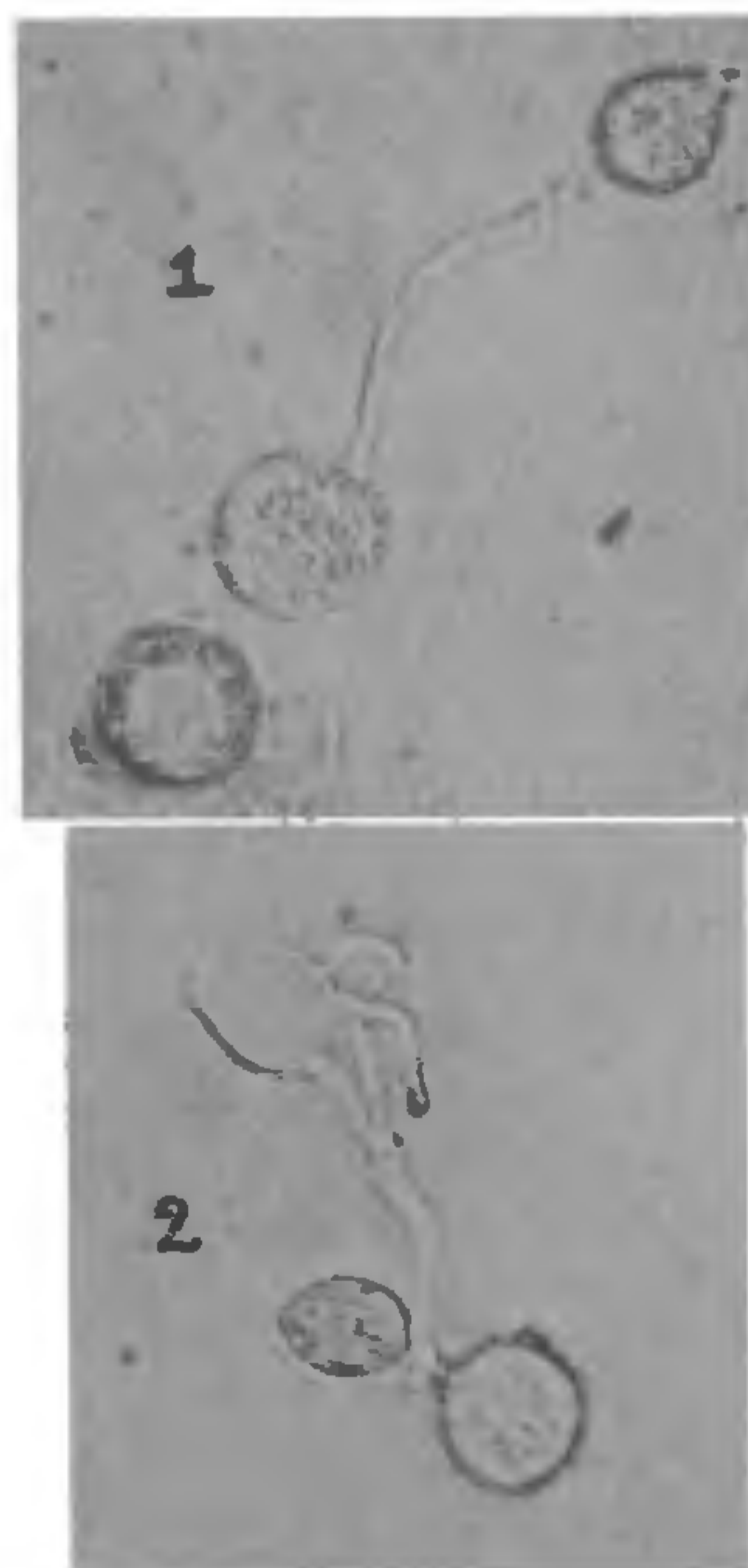
Passage of oospores through snails have resulted in high oospore germination of *P. cactorum*, *P. erythro-septica* and *P. megasperma*. The snail species used were *Planorbarius corneus* (Linn.), *Helix aspersa* (Muller) and *Eopania vermiculata* (Muller)³⁻⁵.

Oospores of *Phytophthora palmivora* (Butler) Butler MF₄ strain (black pepper isolate) were obtained by pairing both the mating types (A¹ × A²), in carrot-Agar supplemented with sitosterol, tryptophan, CaCl₂, 2H₂O and thiamine after incubating in dark at 25°C for 4 weeks. Portion of agar culture full of oospore was smeared smoothly to a cabbage leaf and placed in a beaker. The snail *Cryptozonia semirugata* (Beck) collected in this campus were allowed to graze over the leaf. Snail produced faeces were collected after 8 hours of feeding. The faeces, containing oospores were suspended in sterile distilled water with glass tissue grinder. The oospore suspension was incubated at 22°–25°C in the laboratory in watch glass. The drop of oospore suspension was mounted on a slide and observed for the germination. Germination was recorded at different time interval.

The germination was observed after 2 hr of incubation (1%) and reached maximum (87%) after 96 hours (table 1). The method of germination was by a germ tube measuring 18–210 μm with typical lemon shaped papillated sporangium on the top. In addition,

Table 1 Germination of oospores of *Phytophthora palmivora* (Butler) Butler MF₄ strain (black pepper isolate) at different incubation period after ingestion by snail, *Cryptozonia semirugata* (Beck).

Incubation period (hr.)	Germination (%)
0	0
1	0
2	1
4	4
8	10
24	20
48	37
72	55
96	87



Figures 1 & 2. 1. Germinated oospore with lemon shaped papillated sporangium, 2. Germinated oospore with branched germ tube with one sporangium on each tip.

it was also observed in some cases that the germ tube branched bearing one sporangium on each tip (figures 1 & 2).

This is the first report of the successful *in vitro* germination of *P. palmivora* and thus oospores may help in the perpetuation of this fungus in the gardens.

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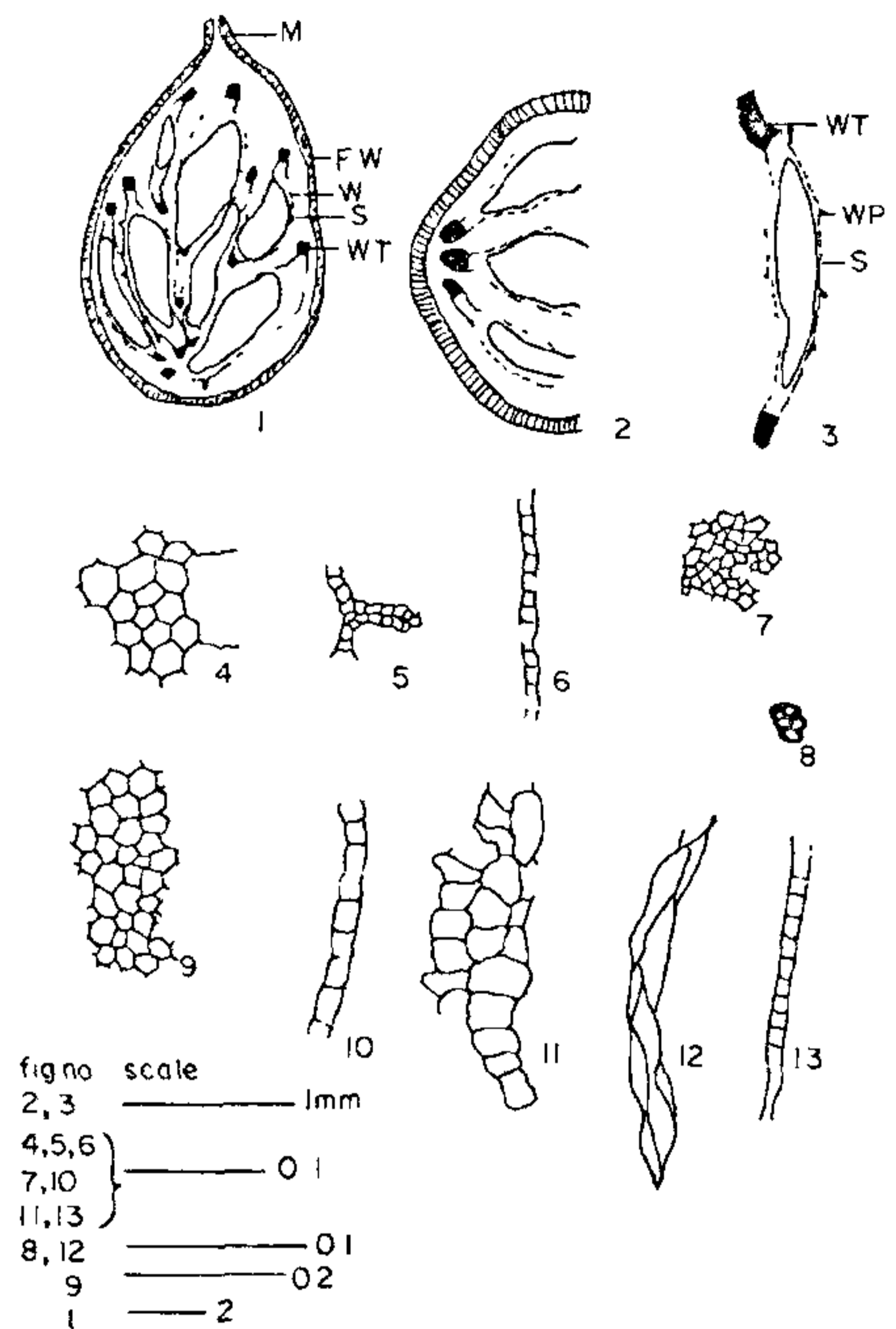
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A FOSSIL CAPSULE WITH WINGED SEEDS FROM THE INTERTRAPPEAN SERIES OF INDIA

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In this note a petrified capsule with winged seeds is described for the first time from the Deccan Intertrappean beds of Mohgaonkalan, (Madhya Pradesh) India. The fruit is unilocular, measures 2.5 × 4.6 mm in size. It is ovoid in shape and slightly tapers at its apex showing an apical slit (M), probably a dehiscing zone of the fruit (figure 1). The pericarp is 70–90 μ thick and differentiated into epicarp, mesocarp and endocarp (figure 2). The epicarp shows single layered epidermis (figure 10) and 2–3 layered columnar parenchymatous hypodermis (figure 11). Few elements of xylem are seen in this region (figure 8). Mesocarp is fibrous and 4–5 celled thick (figure 12). Endocarp is unilayered and parenchymatous (figure 13). The fruit possesses seven well-preserved winged seeds (S) (figure 1). The wing (W) shows pointed ends (figure 3) with sclerenchymatous elements (WT) (figures 4 and 9) and spiny parenchymatous projections (WP) are seen on the margin of the wing (figure 5). The seed coat is unilayered and parenchymatous (figure 6). Internally the seeds are filled with parenchymatous



Figures 1–13: Longitudinally exposed specimen showing seven seeds (WT – Wing tip, S – Seed, W – Wing).

cells which can be referred as endosperm or kernel (figure 7). The embryo is not observed.

The fossil fruit has been compared with the fruits of Meliaceae, Lythraceae, Celastraceae, Bignoniaceae, Scrophulariaceae and Fouquieriaceae (1, 2). But the present specimen differs from other fruits in that they are multichambered and many seeded. However, the genus *Hippocratea* of family Celastraceae resembles in having 1–3 chambered, dehiscent fruits containing few seeds but also differs in size and nature of seeds of the fruit. As it does not come very close to any of the living and fossil forms, it is referred to as a new form genus *Wingspermocarpon mohgaonense* gen. et sp. nov, the generic name being after the winged nature of the seeds and specific name after the locality Mohgaonkalan.

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