

enlarged considerably, and the radicle started to elongate after two weeks. Upon transfer to light the embryos turned green, and germinated within 25–30 days of culture (figure 3). The best results were obtained on MS+IAA (1.5 mg) + kinetin (0.5 mg/l) + CH (250 mg/l). Depending upon the species crossed 48–71% of the embryos gave rise to plants (table 1).

The hybrid ovules also underwent proliferation (figure 1), and this response was genotypically oriented. The diploid species invariably showed profuse callusing as compared with tetraploid *G. hirsutum*^{4,5}. Moreover, the diploid × diploid crosses (*G. arboreum* × *G. anomalum*) showed best growth of the ovules at 0.5 mg/l of kinetin, and germinated after 45–55 days of culture. The tetraploid × diploid crosses (*G. hirsutum* × *G. arboreum*) on the other hand showed better growth on low kinetin medium (0.2 mg/l) and required longer period (60–65 days) to germinate (figure 2). The plantlets with well-developed roots and 2–3 leaves on transferring to the pots (figure 4), and subsequently to the field (figure 5) matured. The hybrid plants were mostly intermediate between their parents for the morphological characters. The hybrids between *G. arboreum* × *G. anomalum* showed vigorous growth, with large leaves and produced large number of flowers. These hybrids will be involved in further crossing with the desirable plants.

Thanks are due to the ICAR and the Bhabha Atomic Research Centre for financial assistance.

30 April 1983; Revised 16 August 1983

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A NEW RACE OF *VERTICILLIUM DAHLIAE* AFFECTING COTTON

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VERTICILLIUM DAHLIAE Kleb. causes a serious wilt disease of winter cottons in South India. First reported near

Coimbatore in 1968 on MCU. 5, a variety of *Gossypium hirsutum*¹, it has subsequently been observed in the Salem and Madurai districts of Tamil Nadu and the Dharwar district of Karnataka. The disease occurs during the cold weather and has a temperature optimum around 22°C. The symptoms are an initial bronzing of the veins of the leaves on plants in the squaring stage followed by interveinal yellowing and drying of the lamina and more or less severe defoliation in the course of a few weeks. Most plants are killed though some may make an attempt at resurrection by putting forth fresh, yellowed and diminutive leaves. The internal tissues of the stem are discoloured (brown). With the onset of the disease boll formation is totally suppressed. There may be total loss of crop in affected patches. Isolates of the pathogen commonly obtained from affected cotton plants (*G. hirsutum*) are characterised in culture by a slow growing, cottony white mycelium with delayed and sparse to heavy production of dark micro-sclerotia on the substrate. Conidia are produced in abundance on verticillate conidiophores on the aerial mycelium. The isolates are able to infect almost all the varieties of *G. hirsutum*, *G. herbaceum* and *G. arboreum* but only a few of *G. barbadense*. The variety Suvin, the most elite variety of the last, developed in India and which has been selected for *Verticillium* resistance, grows free from the disease in wilt-infested areas.

However in recent years Suvin has been affected in a serious form in one of the villages in Coimbatore district. The symptoms consist of veinal bronzing, rapid drying of the entire leaf and severe defoliation resulting in the death of affected plants within a few days of the initial appearance of symptoms. Cultures of the pathogen isolated from affected plants have a poor, mostly submerged mycelium with early development of a thick bed of dark micro-sclerotia and sparse sporulation. These isolates are able to affect a number of other varieties of *G. barbadense* also but the Egyptian varieties particularly the Pima derivatives have shown resistance. They also affect varieties in other cultivated species of *Gossypium*. These isolates appear to constitute a new physiologic race of *V. dahliae* designated as race Iv. 3. Schnathorst² broadly classified the American strains into the mild, non-defoliating strain (SS4) and the severe, defoliating strain (T14). Russian workers have distinguished 6 types varying in virulence³.

G. barbadense has been considered to be an important source of resistance to *Verticillium*⁴. It is clear that while certain groups within the species are susceptible to the new race the Pima cottons are likely to continue

to be useful as sources of resistance.

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SESQUICILLIUM CANDELABRUM: A NEW RECORD FROM INDIAN SOIL

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DURING the survey of soil fungi of Kailash forest (Agra), *Sesquicillium candelabrum* was isolated following soil plate¹ and serial dilution² methods. The petridishes after preparations with PDA and Czapeks Dox agar media were incubated at $28 \pm 1^\circ\text{C}$. The observations were taken after 7 days. The fungus was purified, identified and finally confirmed from CMI, Kew, England. The culture was preserved as type culture in CMI, IMI no. 267113. *S. candelabrum* (Bonorden) W. Gams³.

The fungus tallied with the original description of Gams³. According to Bererra⁴, *Pseudonecteria* has a *Volutella* conidial state, but an additional species may have *Sesquicillium* conidial state.

Colonies whitish at periphery and silver grey in fruiting areas in 7-day old cultures, produces dense irregular pinkish or salmon masses in old cultures. Hyphae hyalin, septate, $4-6\ \mu\text{m}$ in diameter. Conidiophores erect, delicate, septate with whorls of branches of metulae. Each metulae bears a sterigma or phialide, swollen at the middle and tapers towards the apex. The width of sterigmata or phialides varies, $2-8\ \mu\text{m}$ and length ranges from $12-39\ \mu\text{m}$. There are about 2 or 3 metulae, $2-6\ \mu\text{m}$ in diameter and $12-36\ \mu\text{m}$ in length, at branching point. A single globose to ovoid conidium was found on the apex of sterigma or phialide. It is phialiform in which conidiogenous cell does not elongate or enlarge during the production of a succession of conidia from the fixed growing

point. Conidial size ranges from $0.5 \times 4\ \mu\text{m}$ to $1.5 \times 4\ \mu\text{m}$ in diameter (figure 1).

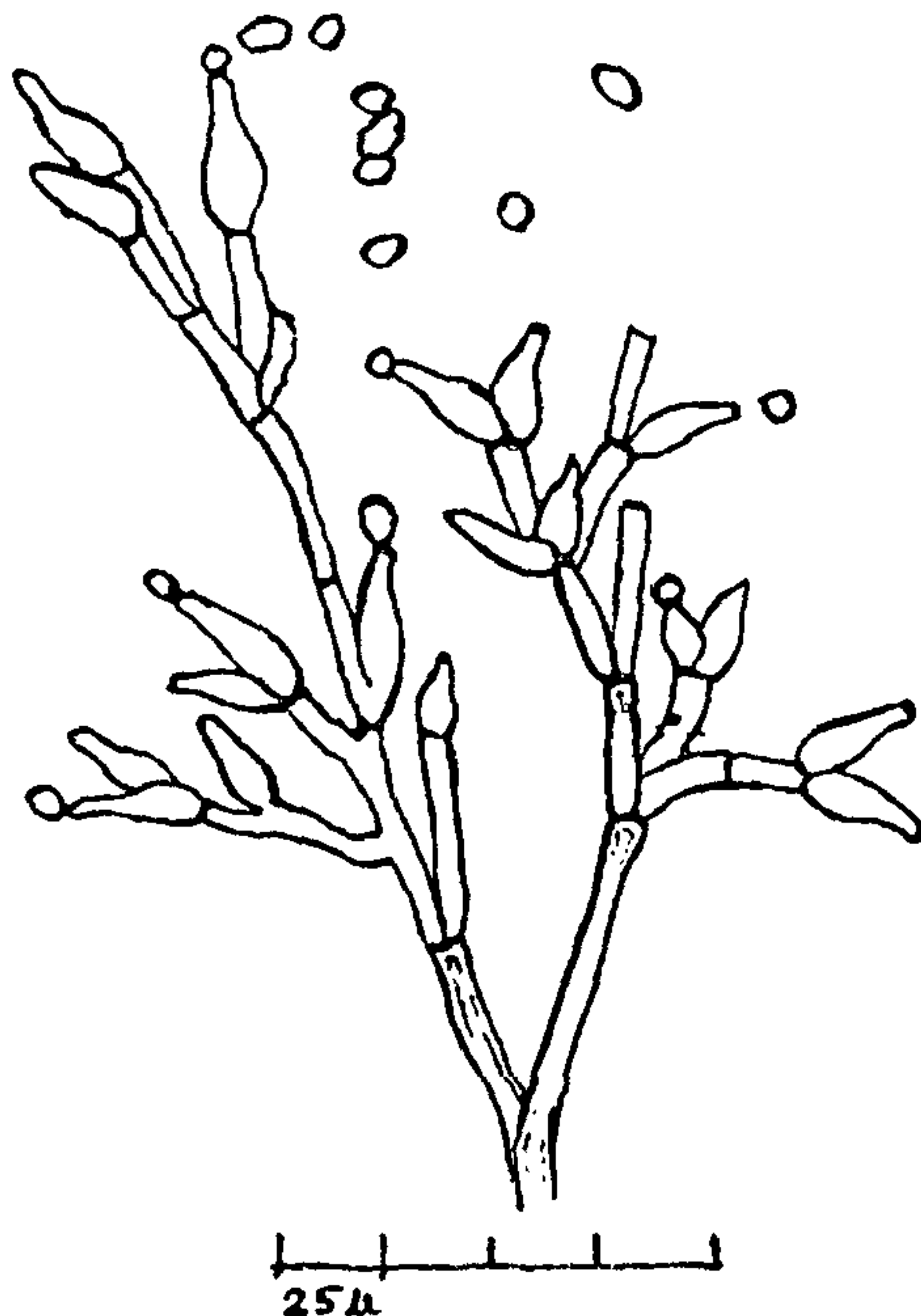


Figure 1. *Sesquicillium candelabrum*.

The authors wish to express their thanks for confirmation of the identity of culture to the Director, CMI, Kew, England and also grateful to the Principal of this College for facilities.

26 October 1982;

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