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Sterility in an Inter-Varietal Hybrid, *Solanum melongena* L. × *S. melongena* var. *bulsarensis* Argikar

S. melongena var. *bulsarensis*, a wild variety of the eggplant reported by Argikar (1952), was morphologically distinct from the cultivars. It was a glabrous annual, with leaves resembling somewhat those of tobacco (Fig. 1). The fruit was spherical, purple coloured, with a leafy elongated calyx and thick cracking pericarp. It was edible, but with peculiar flavour. With a view to study its nature of affinity with the cultivars, it was crossed with 'Manjirigota', a prickly variety of *S. melongena* common in Maharastra State (Fig. 2). The cross could be easily effected with the cultivar as female parent; the reciprocal cross completely failed. The F_1 hybrid was prickly, shrub-like, and perennial (Fig. 3). It was quite robust, exhibiting hybrid vigour in respect of plant height, branching and size of leaf and flower. It produced small parthenocarpic fruits in abundance. Selfing as well as back crossing to both the parents failed to bring about seed set. Ninety percent of the pollen was aborted and shrivelled.

The chromosome number was 24 (2n) in the parents and the hybrid. Meiotic studies on parents revealed no abnormalities. In the hybrid, normal pairing into 12 bivalents occurred in only 31.5% cells at MI. The configuration of 10 bivalents and a quadrivalent was more common, having been observed in 38.3% cells. In rest of the cells, 2 to 4I were noticed in addition to the bivalents. The anaphase separation was abnormal with chromatid bridge in almost all the cells. Megasporogenesis and embryo sac development were normal in the parents, as described by Bhaduri (1932) for *S. melongena*. In the hybrid, early breakdown of these processes was observed. Degeneration, commencing with the megaspore mother cells, continued in tetrads and functioning megaspores in an increasing manner. Almost all the functioning megaspores remained defunct and atrophied, without forming the embryo sacs. Consequently, at the time of anthesis, the ovules were only sterile and compact tissues, devoid of embryo sacs (Fig. 5).

1. *S. melongena* var. *bulsarensis*. 2. *S. melongena* (cultivar. Manjrigota). 3. F_1 hybrid. 4. L. S. of ovary of *S. melongena* showing normal ovules×500. 5. L. S. of ovary of hybrid showing sterile ovules×500.

The meiotic abnormalities observed in the hybrid indicate that the chromosome complements of the two parents probably differ structurally in respect of 1–2 pairs. The hybrid sterility appears mainly chromosomal. A possible role of cryptic structural hybridity cannot be ruled out.

S. melongena var. *bulsarensis* was also crossed with two other cultivars, 'Purple Striped' and 'White Flower' and F_1 hybrids of these crosses also were completely sterile.

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Preliminary Studies on the Cultivation of the European Mushroom *Agaricus bisporus* (Lange) Sing. in Tamil Nadu

Among the edible mushrooms, extensively cultivated are the paddy straw mushroom, *Volvariella* in the tropics and the cultivated white mushroom, *Agaricus bisporus* (Lange) Sing. in the temperate regions (Singer, 1961). *Volvariella diplasia* (Berk & Br.) Sacc. has been successfully cultivated at Coimbatore during the past two decades (Thomas *et al.* 1943, Ramakrishnan *et al.* 1968). In India Sohi *et al.* (1965) have reported some work on the cultivation of *A. bisporus* at Simla. Results of attempts to cultivate this mushroom in Tamil Nadu are reported here.

Trials were conducted at Coimbatore during 1964 winter and at Ootacamund and Kodaikanal during Summer 1966, with the spawn received from Simla. Ordinary rural compost was found unsuitable. Spawn could not also be produced on rice straw. During November 1966 – January 1967 three trials were laid out at the Mycology Laboratory of this Institute, at Ootacamund and at the Bryant Park, Kodaikanal. The spawn was prepared with a pure culture of *A. bisporus* (Syn. *Psalliota hortensis* (A1 strain) obtained from Simla on special compost, which was prepared modifying the formula by Dr. E. F. K. Mantel, F.A.O. Mushroom Expert.

The compost was prepared as a heap on a cement floor in a covered room with the following ingredients: Paddy straw 300 kg, rice bran 50 kg, $(NH_4)_2 SO_4$. 9 kg, urea 4 kg, superphosphate 9 kg, calcium carbonate 10 kg, and gypsum 15 kg. The straw was cut into small pieces of 15-20 cm in length in a chaff cutter. Water was sprinkled with a rose-can just to moisten the straw pieces. Fertilisers and rice bran were mixed with a little straw so as to form a homogeneous mixture. The straw was laid in a layer of 15-20 cm in height on the floor in an area of 1.30×1.30 metres and a portion of the fertilizer straw mixture was sprinkled over the straw. Then another layer of straw was built over the first and the fertilizer sprinkled. In this manner the layers were built up one over the other till the heap was 1.50 metres in height. It was pressed and compacted on all sides. After six days, the heap was turned a number of times, sprinkling a little water to maintain the moisture. Calcium carbonate