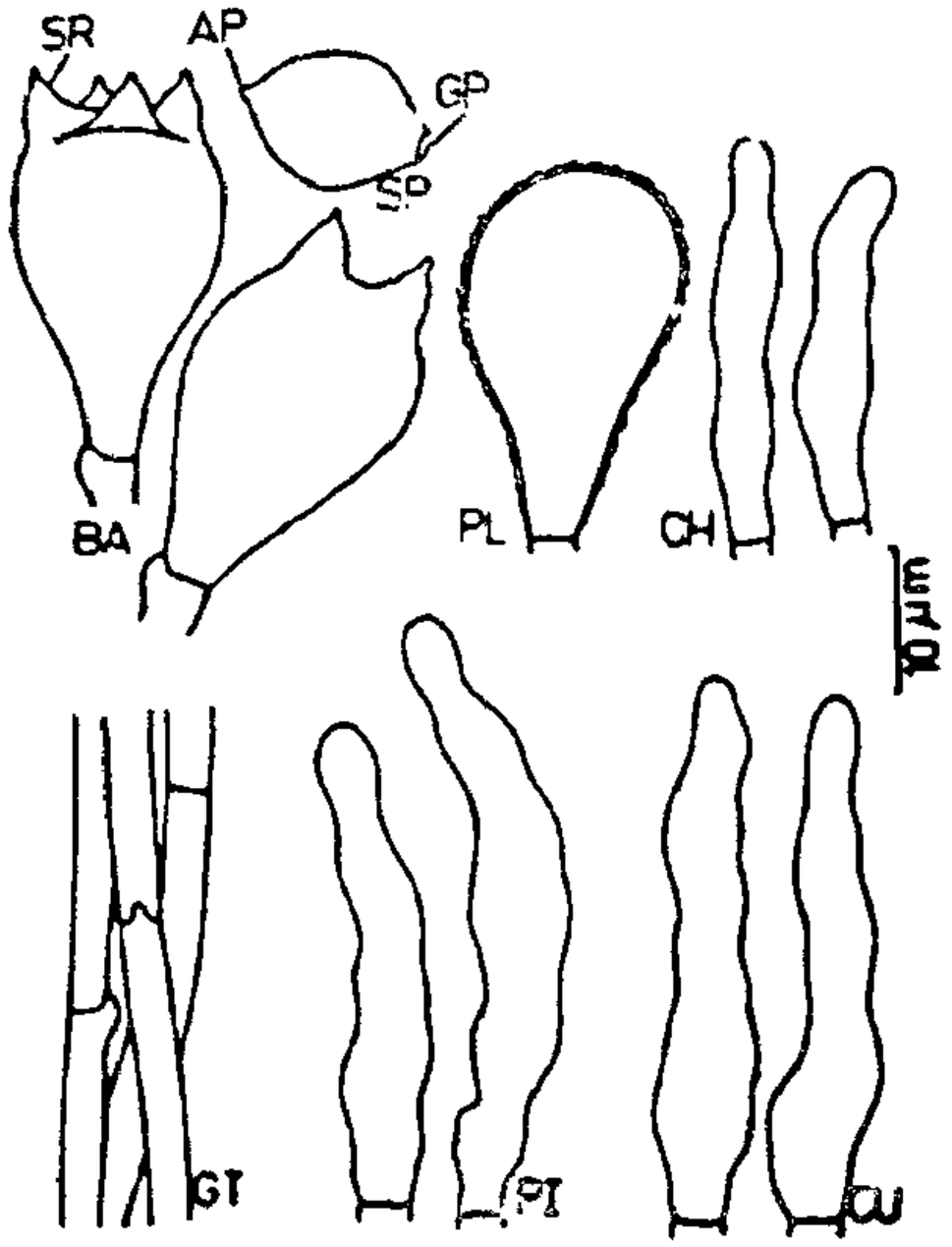

FIG. 2. Camera lucida drawing showing: SP—Spore; AP—Apicule; GP—Germpore; BA—Basidia; SR—Sterigmata; PL—Pleurocystidia; CH—Cheilocystidia; GT—Gill Trama; PI—Pilocystidia; CU—Caulocystidia.

BASIDIA : (22·88–) 25·74 (–28·6) × (12·87–) 14·30 (–17·16) µm, Q = 1·8; bi tc tetrasporic; pear-shaped; sterigmata 3·575–5·72 µm long, 3·575–5·005 µm broad; cyanophilous, inamyloid in Melzer.

SPORE PRINT : Leaden black (sooty).

BASIDIOSPORES : 12·87 (–14·30) × (8·58–) 10·00 (–11·44) µm, Q = 1·285; oval to broadly ellipsoidal—lemon-shaped with faintly hexagonal outline; wall brownish black, opaque; apicule lateral; not losing colour in sulfuric acid; germpore truncate with callus, 2·145–2·86 µm wide.

HABITAT : On dung.

GROWTH TYPE : Solitary.

MATERIAL EXAMINED : AMH 4024 (M–609) HOLOTYPUS.

Latin diagnosis :

Paneolus indicus sp. nov. Sathe and Daniel

Species haec et *P. campanulatus* inter sese valde affines sunt, praeter characteres sequentes :

1. Basidiospora parvioribus; 2. Piliocystidis biforma; 3. Pleurocystidis pyriformibus numerosis; 4. Basidiis pyriformibus, bi vel tetrasporis.

Habitato: coprophilo.

Typus locus Kottayamum in Kerala, in parte Indiae austro-occidentali. Holotypus: AMH 4024 (M-609).

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Maharashtra Association for the Cultivation of Science, Research Institute, Law College Road, Pune 411 004, *May* 12, 1979.

A. V. SATHE.
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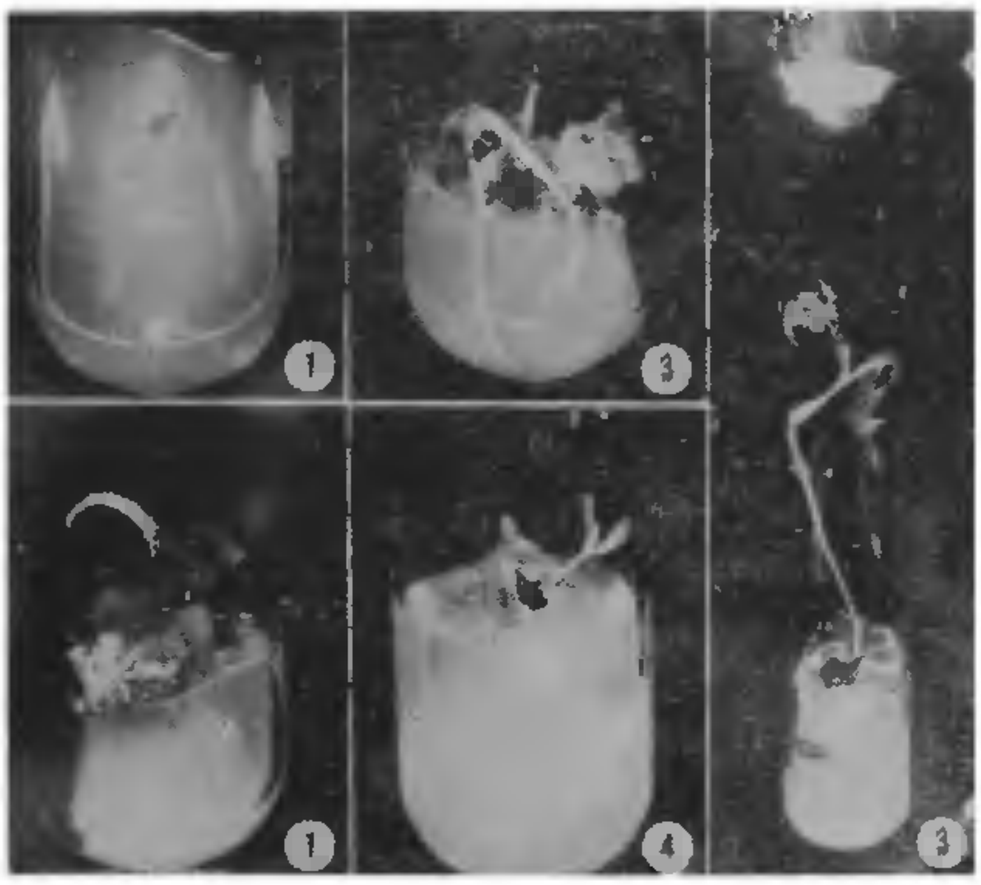
REGENERATION OF PLANTS FROM APICAL MERISTEM TIPS OF SOME LEGUMES

COMPLETE plants have been regenerated from excised shoot apices of various cultivars of *Cicer arietinum*, *Lens esculentum*, *Pisum sativum*, *Phaseolus aureus*, and *P. mungo*. Of the various mdeia tested, the best growth response and development of plants were obtained on Murashige and Skoog's medium supplemented with IAA (2 mg/1) + kinetin (0·5 mg/1). The percentage regeneration of plant was directly proportional fo the size of the meristem.

Legumes (pulses) are the main source of dietary protein in India and South America. During the last decade, their yield has become almost static as there has been an enormous loss caused by various pathogens[1], especially viruses. The routine methods of plant improvement seem insufficient to cope with the situation. Therefore attempts are being made to resort to unconventional methods. In this connection, culture of excised merstems is an accepted method employed for obtaining virus free plants[2]. The present communication is part of a project undertaken to explore the possibilities of employing the in *vitro* methods for crop improvement, and deals with the regeneration of entire plants from excised meristem of some pulses.

The seeds of various cultivars of Indian pulses, *i.e.*, *Pisum sativum* L. (cv. PG 3), *Phaseolus aureus* Roxb. (cv. ML 1, ML 5, G 65), *P. mungo* L. (cv. Mash 1–1), *Cicer arietinum* L. (cv. G 543, G 130, L 550) and *Lens esculentum* Moench (cv. L 9–12) were sown in pots under natural conditions. Two to three weeks after germination the shoot tips (1 cm) were removed, surface sterilized with chlorine water for about 15 min and

washed twice with sterile distilled water. Meristems (0·2–2 0 mm) were dissected aseptically under a stereo microscope in a Laminar Flow Cabinet (Klenzaids, Bombay) and cultured on the modified agar solidified Murashige and Skoog's medium[3], supplemented with various combinations and concentrations of IAA, 2,4-D, NAA, casein hydrolysate and kinetin. In each cultivar 50–125 cultures were raised. They were maintained at 23–27° C and observed periodically.



FIGS. 1–5. The *in vitro* growth response of excised meristem tips of various legumes. Fig. 1. A two-week-old culture of meristem (0·5 mm) of *Phaseolus mungo* cv. Mash 1–1 on MS medium, supplemented with 2,4-D (2 mg/l). Fig. 2. Same, after 5 weeks showing profuse callusing. Fig. 3. A 5-week-old culture of *Cicer arietinum* cv. G–543 on the basal medium containing NAA (0·1 mg/l) + BA (0·02 mg/l); note the proliferation and emergence of roots. Figs. 4, 5. Shwoing the regeneration of complete plants of *Phaseolus aureus* cv. ML–5 on IAA (2 mg/l) + kinetin (0·5 mg/l), 3 and 5 weeks after culture respectively.

The *in vitro* growth and development of meristems (0·5–2·0 mm) of various legumes is shown in Figs. 1–5. The meristems showed signs of growth within a week; however, further development was strongly determined by their size. There was a direct correlation between the size and the percentage regeneration of plants (Fig. 6). The longer the meristem tip, the higher was the regeneration[4]. The addition of 2,4-D (1–2 mg/l) to the medium caused a profuse proliferation to form a mass of callus (Fig. 2) whereas the root and the shoot formation were strongly inhibited. The relative ratio between auxin and cytokinin considerably influenced the overall response[6]. Increased kinetin (2 mg/l) inhibited root formation whereas IAA at 2 mg/l yielded plants[6]. The best growth and regeneration of the plants were observed on 2 mg/l IAA + 0·5 mg/l kinetin (Figs. 4, 5), however, the response was genotypically oriented. In *Phaseolus aureus*, the best growth response was shown by the cv. ML 5, followed by ML 1 and G 65, whereas in *Cicer arietinum* G 130 was the best, followed by G 543 and L 550.

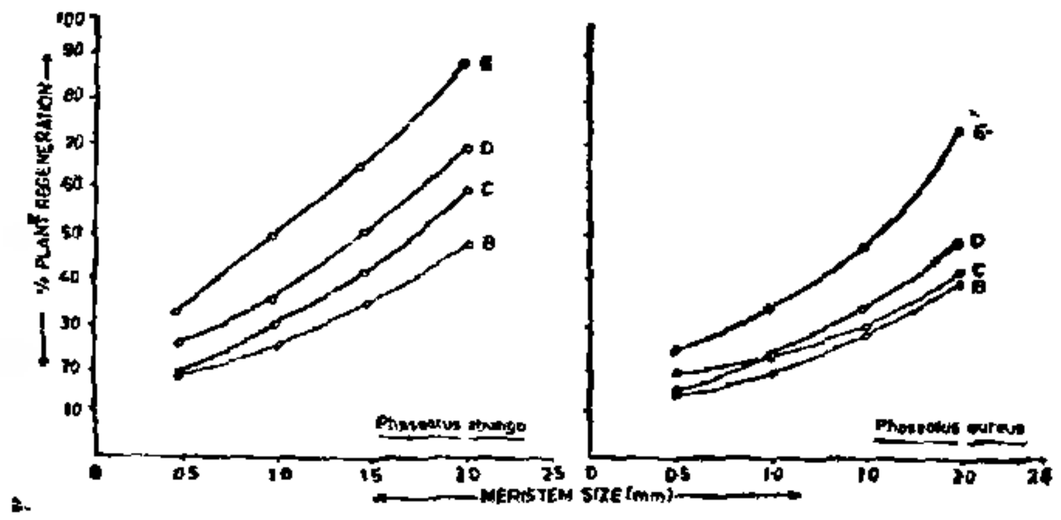


FIG. 6. Correlation between the percentage of plant regeneration and the size of the excised meristem of *Phaseolus aureus* and *P. mungo*, cultured on the Murashige and Skoog's medium, supplemented with various concentrations of IAA/kinetin [A (0), B (0·1/0·02), C (0·5/0·1), D (1/0·2) and E (2/0·5)].

These observations on the regeneration of the entire plants from the excised meristems of various pulses are being utilized for the storage and maintenance of the germplasm[7].

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A NEW CHROMOSOME NUMBER FOR *BALANOPHORA ABBREVIATA* BLUME

HANSEN[1] in his taxonomic monograph on the genus *Balanophora* J. R. and G. Forst. stressed that the information on chromosome counts for the taxon is badly needed. This fungoid achlorophyllous holoroot-parasitic genus has about 15 species distributed in the tropical and subtropical parts of the world[1,2].