

**Table 2** Breeding test for hybridization of *P. scolopendria*, sporophyte formation in isolate, pair and mixed culture

Sex expression	Population	No. of gametophyte studied	No. of gametophyte produced sporophyte	%Gametophyte producing sporophyte
Male to hermaphrodite and female	Isolate (15 gametophytes)	15	1	6.6%
	Pairs (40 gametophytes) two gametophytes per petriplate	40	5 × 2 = 10 11 × 1 = 11	52.5%
	Mixed (20 gametophytes per petriplate) 20 petriplates	400	383	95.7%

these places. The 50% of sporophyte formation in pairs of gametophytes in the present series of experiments is probably not significant because there are equal chances of the members constituting the pairs to be sibs or nonsibs as no particular care was taken to keep them apart in this way. This is perhaps evident from the result of the percentage of emerging sporophytes from such cultures, which deviated significantly from those of the composite cultures (table 2).

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## EFFECT OF ALTERED SURFACE TENSION ON HYPHAL MORPHOGENESIS IN SOME FUNGI

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FUNGAL hyphae, generally form branches, some distance behind the apex, alternately on the two sides. These laterals may branch further in a similar manner. This system of branching has been found to be optimal

for absorbing nutrients from substratum<sup>1</sup>. Nutritional<sup>2, 3</sup>, chemical<sup>4-6</sup> as well as physical factors such as temperature<sup>7</sup>, osmotic shock<sup>8</sup> and the physical nature of the surface<sup>9</sup> are known to influence hyphal branching. However, the influence of an important physical factor viz surface tension on hyphal differentiation is not worked out so far. In the present paper an attempt has been made to find out the influence of surface tension on hyphal differentiation of fungi belonging to different taxa.

Single spore isolates of *Bipolaris sorokiniana* (Sacc in Sorok) Shoemaker, *Botryodiplodia theobromae* Pat., *Polyporus versicolor* L ex Fries and *Syncephalastrum racemosum* Cohn and a single hyphal tip culture of *Rhizoctonia solani* Kuhn were used. A plug of mycelium cut from the margin of an actively growing colony was placed on Czapek-Dox agar medium amended with Tween 80 (polyoxyethylene sorbitan monooleate—Sigma). This is a non-toxic neutral detergent and was added to the medium to give a final concentration of 0.5, 0.8 or 1.0%. Growth was observed after 48 hr of incubation at 30 ± 1°C. The number of hyphal tips formed was counted and the results were analyzed using student's *t* test.

Addition of surface tension depressant to the medium increased significantly the number of branches formed in both aseptate and septate fungi (table 1). The branching potential of *B. theobromae*, *R. solani* and *S. racemosum* was increased 6, 5 and 4 folds respectively when the surface tension was reduced. However, the magnitude of hyphal branching due to reduced surface tension in *B. sorokiniana* and *P. versicolor* was less than that of the other fungi studied.

Although reduced surface tension alters the growth characteristics of prokaryotes<sup>10, 11</sup>, the mechanism of

Table 1 Effect of Tween 80 on hyphal differentiation in some fungi

Concentration of Tween 80 (%)	Number of hyphal tips*				
	<i>B. sorokiniana</i>	<i>B. theobromae</i>	<i>P. versicolor</i>	<i>R. solani</i>	<i>S. racemosum</i>
0	58.0	100.0	41.4	45.3	63.6
0.5	61.6	336.3	73.8	118.3	218.7
0.8	77.6	667.3	82.5	163.3	219.5
1.0	79.3	362.2	71.7	196.6	201.4
Critical Difference at 5% level	16.3	59.7	5.0	21.7	30.1

\*per unit width (1.6 mm) of colony margin after 48 hr growth.

such alterations is not clear. It is possible to explain this phenomenon in the light of the model proposed by Trinci<sup>7</sup> for branching in fungi. Trinci's model envisages a constant rate of production of cytoplasmic components (vesicles, precursors of wall polymers, wall synthetic and wall lytic enzymes) through out the mycelium. These are then transported towards the tips of hyphae under the influence of a polarizing mechanism<sup>12</sup>. In this model an event which stops or reduces the transport of protoplasm within the mycelium results in branch initiation. Surface tension is known to determine the transport of cytoplasmic components<sup>13</sup> and hyphal branching is a consequence of altered rate of transport<sup>7</sup>. These facts when viewed in the light of our results strengthen our belief that altering the energy relationship at agar-air interface induces branching by interfering with the velocity of cytoplasmic flow.

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#### SEVIN-INDUCED STIMULATION OF GROWTH AND METABOLISM OF MUNGBEAN (*VIGNA RADIATA* L WILCZEK) SEEDLINGS

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SEVIN (1-naphthyl-n-methyl carbamate), a widely used pesticide of carbamate group, has been reported to cause mutagenic effects in *Drosophila* flies<sup>1</sup>, chromosome abnormalities in mitotic and meiotic cells of plants and male gametes of *Poecilocus pictus*<sup>2</sup> as well as produce adverse effects on protein, carbohydrate and lipid metabolism in the fish *Cirrihinus mrigale*<sup>3</sup>. The present investigation was undertaken to see the effects of Sevin on root and hypocotyl lengths, ac-