

### SURVIVAL OF BACTERIAL INOCULANTS IN A CHEAPER CARRIER MATERIAL

WHILE finely ground peat is considered as the most satisfactory carrier for *Rhizobium*, other materials like lignite<sup>1</sup> and cellulose powder<sup>2</sup> have also been found to be suitable for this purpose. Charcoal as an alternative choice, found favour probably due to its capacity for absorption of toxic compounds and aeration of the medium conducive for enhancing the longevity of the bacteria<sup>3-5</sup>.

Although peat is considered as most satisfactory, its absence both in quantity and quality in India

of  $126 \times 10^8$  and  $53 \times 10^8$ /ml, respectively) was added to the peat and other combinations and the moisture content of the carriers was brought to 45% of the water-holding capacity, by adding sterile water. *Azotobacter chroococcum* was grown in Jensen's nitrogen-free-medium<sup>6</sup> for 14 days till it attained a count of  $74 \times 10^8$ /ml. The materials were incubated at temperatures varying from 27-33° C. To study the survival of *Rhizobium* in these carriers, plate counts were made by standard dilution procedures on the yeast-extract-mannitol-agar medium containing congo red<sup>7,8</sup>. For *Azotobacter chroococcum* Jensen's medium containing agar was used.

TABLE I

*Survival of Rhizobium japonicum, R. leguminosarum and Azotobacter chroococcum in various carriers at varying room temperatures (Average of 2 replicates)*

Organism	Carrier	No. of viable cells/g							
		1 week $\times 10^8$	2 weeks $\times 10^8$	4 weeks $\times 10^8$	8 weeks $\times 10^9$	12 weeks $\times 10^9$	16 weeks $\times 10^9$	20 weeks $\times 10^8$	24 weeks $\times 10^7$
<i>Rhizobium japonicum</i>	Peat	23.00	33.00	61.00	73.00	49.00	19.00	8.00	30.00
	Charcoal	19.00	4.00	41.00	86.00	19.00	6.10	1.80	3.90
	Charcoal + soil	27.00	83.00	190.00	68.00	72.00	86.00	440.00	540.00
<i>Rhizobium leguminosarum</i>	Peat	490.00	45.00	420.00	108.00	173.00	98.00	880.00	640.00
	Charcoal	380.00	6.40	50.00	117.00	76.00	390.00	2.40	6.70
	Charcoal + soil	660.00	63.00	980.00	150.00	234.00	194.00	1410.00	1490.00
<i>Azotobacter chroococcum</i>	Peat	2.20	0.27	5.30	29.00	17.00	0.80	0.44	0.21
	Charcoal	2.50	0.20	6.20	9.80	9.10	0.39	0.78	0.86
	Charcoal + soil	2.90	0.25	6.20	2.70	6.60	1.13	0.74	8.50

necessitated search for alternative sources. These studies are reported here.

Mixture of peat, charcoal, and charcoal + soil (75: 25) were sampled through 100 mesh sieve. They were supplemented with monocalcium phosphate and calcium carbonate. For *Azotobacter chroococcum* in the carrier, traces of  $\text{CuSO}_4$ ,  $\text{Na}_2\text{MoO}_4$ ,  $\text{H}_3\text{BO}_3$  and  $\text{FeSO}_4$  were added. After sterilisation, Brassicol (75% PCNB) was added to the carriers and mixed thoroughly. Efficient strains of *Rhizobium japonicum* and *R. leguminosarum* were grown in yeast-extract-mannitol medium and shaken continuously on a rotary shaker for 7 days at 28-30° C and 20 ml of each (having a titre value

Survival of *R. japonicum*, *R. leguminosarum* and *Azotobacter chroococcum* is shown in Table I. It is clear that rhizobia and *Azotobacter* applied in modified charcoal-soil based carrier survive in much greater numbers than those applied in other carriers. Even after 6 months more than the minimum standards of  $10^7$  cells/g of inoculant was maintained by charcoal and soil mixture, which appeared to be reasonable to bring about nodulation when the seeds are inoculated. Thus the carrier of modified charcoal-soil mixture is efficient for use when peat is in short supply.

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#### A NEW SPECIES OF *BARTALINIA*

DURING the course of the investigation on soil mycoflora a coelomycete fungus *Bartalinia* sp. was isolated from soil collected at Thirthahalli, Shimoga District, Karnataka. The present isolate differed from other known species<sup>1,2</sup> namely *Bartalinia robillardoides*, *B. biscofiae*, *B. bella* in possessing bigger pycnidia, longer conidia and setulae and hence it is described here as a new species namely *Bartalinia terricola*.

The following description is based on the growth of the isolate on Potato Dextrose Agar Medium.

*Brtalinia terricola* sp. nov. (Fig. 1)

Black pycnidial initials appear in 3-4 days and are well developed in 6-7 days. Pycnidia brown to black, subglobose to irregular, 1-1.8 mm in diameter, papillate, scattered, numerous, coalescing with each other, cavity unilocular. Conidiophores lining inner wall cylindrical to obclavate, hyaline, annellidic with apical percurrent proliferations, thin walled  $6-7 \times 7-8.5 \mu$  in size forming solitary conidia at the apex. Conidia holoblastic, hyaline, cylindrical to fusiform 3 septate measuring  $18-31 \times 4.4 \mu$  with trifurcate apical hyaline appendage  $14-22 \mu$  long and a simple basal pedicel measuring  $4-13 \mu$  in length.

Initia pycnidiorum nigra, intra 3-4 dies orientia et intra 6-7 dies complete efformata. Pycnidia brunnea vel nigra, subglobosa vel irregularia, 1-1.8 mm. diam., papillosa, dispersa numerosa, inter se

coalescentia, cavitate uniloculari. Conidiophora parietibus internis insita, cylindrica vel obclavata, proliferationibus ad apicem percurrentibus, parietibus tenuibus,  $6-7 \times 7-8.5 \mu$ . Conidia solitaria ad apicem efformantia, holoblastica, hyalina, cylindrica vel fusiformia, triseptata,  $18-31 \times 4.4 \mu$ , appendice hyalina, apicali, trifurcata,  $14-22 \mu$  longa et pedicello simplici basali  $4-13 \mu$  longa.

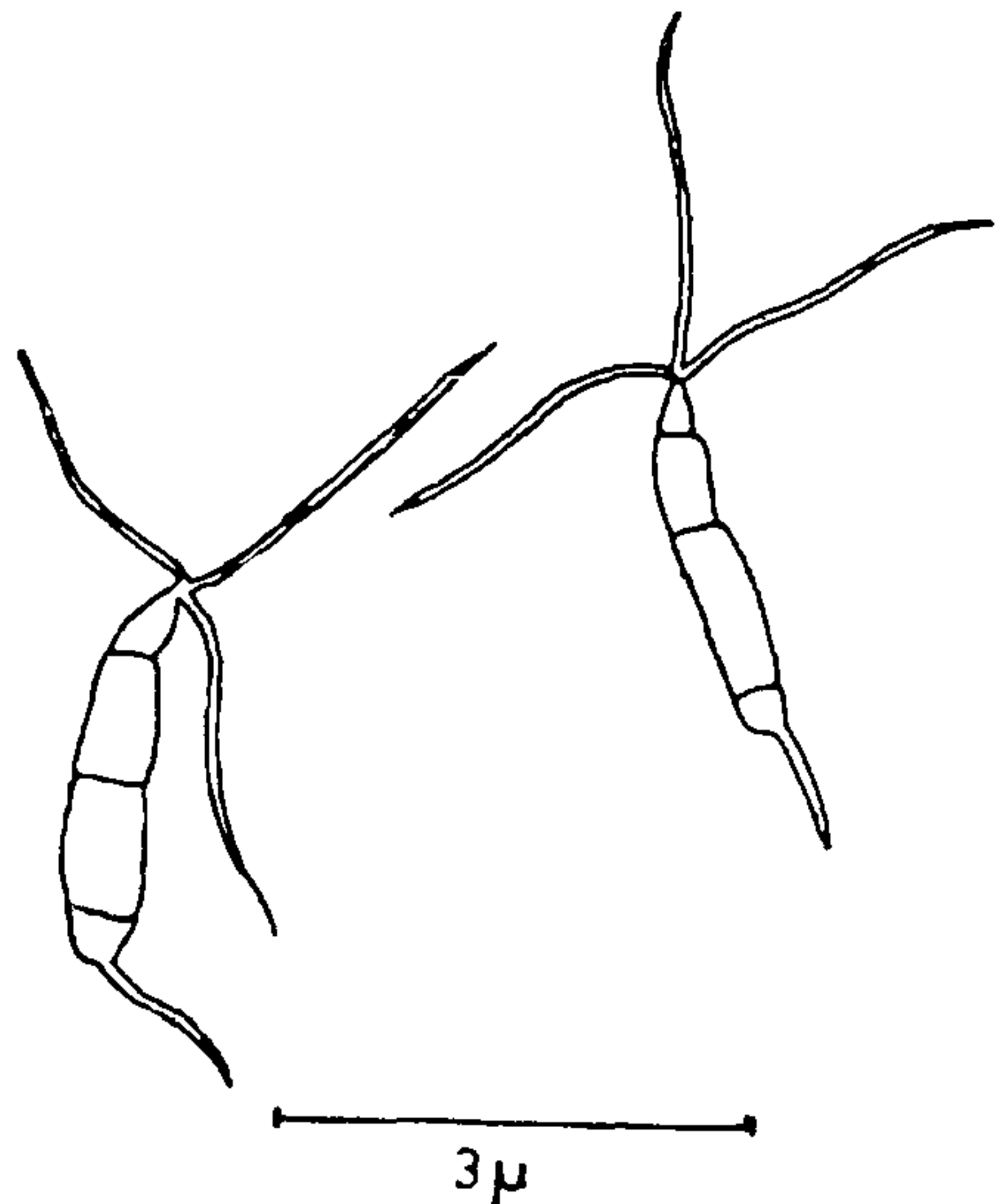


FIG. 1. Conidia of *Bartalinia terricola* sp. nov.

The culture has been deposited at C.M.I., Kew, under number IMI 230563 (Holotype) and also at mycological collection unit, Bangalore University under no. BU30.

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