

TABLE 2

Effect of GA₃ and its interaction with thiamine (B₁) on protein content of the root (as mg/g dry wt)

Days after sowing	Control	GA ₃	B ₁	GA ₃ + B ₁
2	153 ± 2.7	105 ± 1 (-31.3) ^a	144 ± 1.5 (-5.8) ^b	97.5 ± 2.2 (-7.12) ^c
4	73.5 ± 0.6	90 ± 1.6 (22.4)	108 ± 1.8 (46.8)	87 ± 2.4 (-3.3)
6	63 ± 1.5	81 ± 1.2 (28.6)	93 ± 1.3 (47.5)	69 ± 1.2 (-14.8)
8	39 ± 0.9	51 ± 1.7 (30.7)	61.5 ± 1.1 (57.7)	48 ± 0.8 (-5.8)

Figures in the parenthesis indicate: ^apercentage decrease (-) and increase over control; ^c revise leading percentage decrease (-) over gibberellic acid.

and wall synthesis. Thiamine might activate GA₃ in this respect *i.e.*, in cell elongation of the root in the present study. The percentage recovery over GA₃ inhibited root growth (table 1) with vitamin B₁ interaction is not commensurate with the percentage recovery in protein content (table 2). Instead, the interaction of GA₃ with vitamin B₁ reduced the protein content far below the level of B₁-stimulated protein content itself. Thus, the present study indicates that thiamine may act synergistically with gibberellic acid in promoting root elongation through increasing not only the protein content but also cell elongation quite possibly.

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SORDARIA LAPPAE POTEBO—AN UNRECORDED ASCOMYCETES FROM INDIA

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DIVERSE array of micro-organisms exists in soil and the combined effect of various edaphic and climatic factors and the geology of a particular area determine the micro-population in the soil¹. The soil mycoflora of Jammu and Kashmir has not been explored and therefore a number of soil samples were collected in sterilized polythene bags from various places, representing different forest consociations. While isolating the soil mycoflora by soil plate method² using streptomycin rose bengal medium³, one of the soil isolates gave numerous perithecia with abundant asci and ascospores that appeared typical of the genus *Sordaria*. The identity of the fungal isolate was confirmed as *Sordaria lappae* Poteb. by CMI, Kew, England. It was reported first by Potebnia¹, on the putrescent stem of *Lappa major* in association with *Helminthosporium brachycladum* in Herbarium. But no report⁴ regarding its existence in Indian soil mycoflora has yet appeared. It is therefore a new addition to the fungi of India.

Characteristics of the fungus

Colonies on potato dextrose agar medium growing moderately, with most of the mycelium subterranean. Perithecia formed in a weak irregularly scattered, dark brown to black, ostiolate, pyriform and nearly half sunken, overall dimensions 390-600 × 320-400 μm including the neck which measures 70-160

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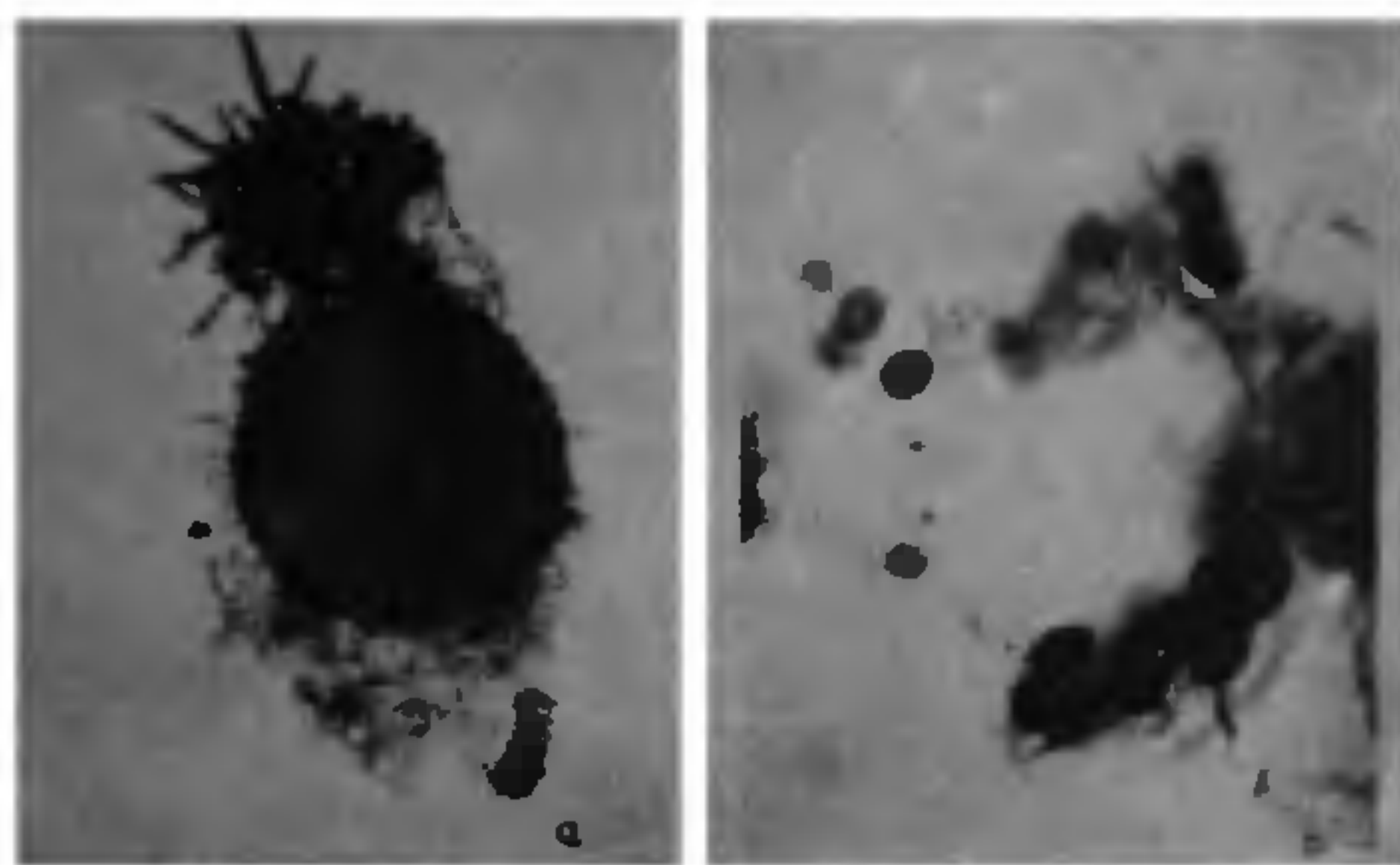


Figure 1. *Sordaria lappae* a. Perithecia ($\times 100$) b. Ascospores ($\times 450$).

μm ; neck straight to bent on one side to rostrate; asci cylindrical, 8 spored, $120\text{--}200 \times 12\text{--}20 \mu\text{m}$; ascospores uniseriate, dark brown at maturity, surrounded by a gelatinous sheath and provided with germ pores, $20\text{--}40 \times 8\text{--}16.5 \mu\text{m}$ (figure 1).

Isolated from the forest soils of Jammu and Kashmir state during November 1981. The culture has been deposited with CMI, Kew, England (IMI No. 266994).

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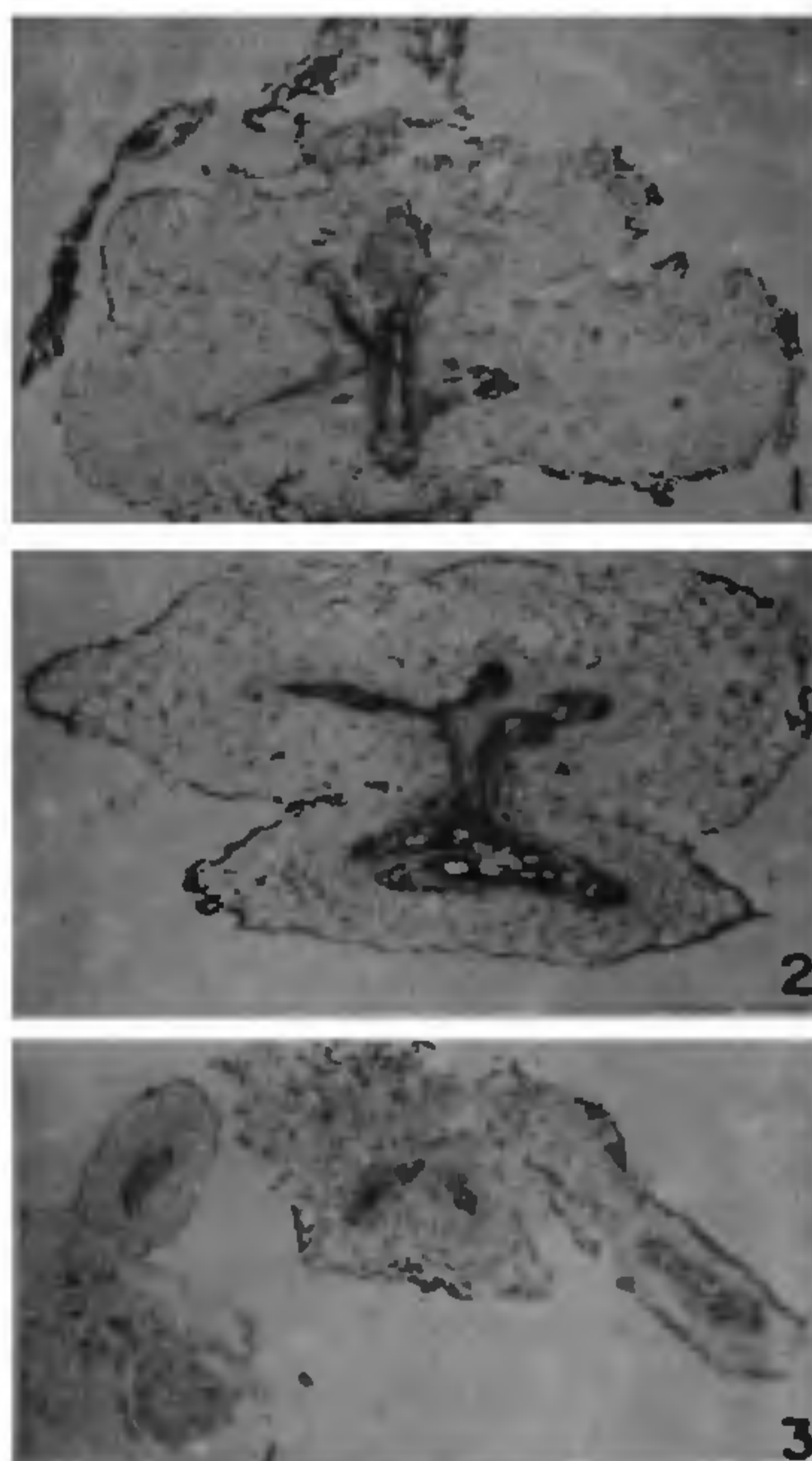
PSEUDONODULES IN *CICER ARIETINUM* L.

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BEAL¹ observed swollen root tips in sweet pea induced by the foliar application of 4-chlorophenoxy acetic acid. Wilde² observed that red kidney bean grown in soil treated with 2,4-D produced distinctive terminal arrowhead swellings on the main roots. Histological

studies of these roots showed the pericyclic proliferation limited to the root tip areas. Allen *et al*³ studied six leguminous species (*Lens esculentum*, *Pisum sativum*, *Arachis hypogaea*, *Glycine max*, *Vigna sinensis* and *Phaseolus vulgaris*) which were both inoculated by *Rhizobium japonicum* and treated with 2-bromo-3,5-Dichlorobenzoic acid. They found the hypertrophies resembling the typical root nodules in size, shape and location developed on the root system. Histological studies provided the evidence that these pseudonodular outgrowths were the modified rootlets. In the present paper pseudonodules which were formed as a result of addition of different rhizobial strains on *Cicer arietinum* L. are described.

During the cross-inoculation studies of 10 rhizobial isolates of leguminous weeds (*Erythrina suberosa*, *Lathyrus aphaca*, *L. sativus*, *Medicago polymorpha*, *Melilotus indica*, *Tephrosia apollinea*, *Trigonella corniculata*, *T. polycerata*, *Vicia hirsuta* and *V. sativa*) on *Cicer arietinum* it was observed that none of the rhi-



Figures 1-3 *Cicer arietinum*. 1 and 2 Pseudonodules formed by inoculation with rhizobium of *Lathyrus aphaca* $\times 24, 25$. 3. Pseudonodules developed after cross-inoculation by rhizobium of *Trigonella polycerata*, note main root with lateral roots having swollen cortices at the base. $\times 8$.