

The treatments consisted sprays of endrin 0.04%, parathion 0.05%, Heliothox (Toxaphene + DDT) (4 ml/litre), fenthion 0.125%, Trichlorfon 0.12% and Fenitrothion 0.1%. In each plot ten clumps were selected at random at the rate of five in each of the diagonal lines in each plot. The infestation was assessed by counting the total number of leaves and number of leaves showing leaf roller attack (70 days after planting) before spraying. Two days after spraying, the number of the dead caterpillars lying in between three rows of plants were counted in each plot. The rows were selected in such a way that they passed through the maximum infested area. For easy counting, the water level in the field was kept to a minimum. The mean number of dead caterpillars in treated plot was corrected by using the formula :

$$\text{Corrected mortality (C.M.)} = \frac{M_t - M_c}{I_c} \times I_t$$

M — Mean mortality (Number of caterpillars)  
I — Mean infestation (%)  
c — in control plot, t — in treated plot.

The efficacy of the chemical was assessed by using the formula :

$$\text{Efficiency Index (E.I.)} = \frac{\text{C.M.}}{I_t} \times 100.$$

TABLE I  
Efficacy of insecticides against leaf roller  
(Mean of 3 observations)

Treatments	Mean infestation (%)	Mean number of dead caterpillars		Efficiency index E.I.
		Actual	Corrected	
Endrin E.C.	51.1	11.33	7.09	13.87
Parathion (Folidol E.C.)	47.8	6.67	2.70	5.65
Heliothox E.C. (Toxaphene+DDT)	67.5	38.00	32.40	48.00
Fenthion (Labaycid E.C.)	51.6	6.33	2.05	3.97
Trichlorfon (Dipterex W.S.P.)	31.0	9.67	7.10	22.90
Fenitrothion (Folithion E.C.)	54.0	10.00	5.52	10.22
Control	40.1	3.33	..	..

As the number of dead caterpillars vary with the chemicals as well as the degree of infestation, a correction was used based on the percentage of infestation. As uniform plant population was maintained with uniform spacing, the variation in number of leaves was not much and hence the percentage

of infestation has been used in the formula. Heliothox could cause high rate of kill of leaf roller caterpillars followed by trichlorfon. Endrin and fenitrothion were next best. Parathion was not effective as reported by Gargav *et al.*<sup>2</sup> and Khaire and Bhapkar<sup>3</sup>.

Tamil Nadu Agricultural University,

A. REGUPATHY.  
S. JAYARAJ.

Madurai-625104, February 16, 1975.

1. Abraham, E. V., *Madras agric. J.*, 1958, 45, 273.
2. Velusamy, R., *Unpub. M.Sc. (Ag.) Dissertation, Univ. Madras*, 1970.
3. Gargav, V. P., Patel, R. K. and Katiyar, O. P., *Indian J. agric. Sci.*, 1971, 41, 47.
4. Khaire, V. M. and Bhapkar, D. G., *Pesticides*, 1972, 6, 13.
5. Balasubramaniam, G., Saravanabhavanandham, M. and Subramaniam, T. R., *Madras agric. J.*, 1973, 60, 425.

#### A NEW SPECIES OF *PODOXYPHIUM* (SPHAEROPSIDALES)

AN interesting species of *Podoxyphium* Speg. was collected on rotted fruits of *Sapodilla* at Poona. This proved to be distinct from other known species<sup>1,2</sup>. Hence, the same is described here as new to science.

*Podoxyphium poonensis* sp. nov. Subram. and Rao  
(Fig. 1)

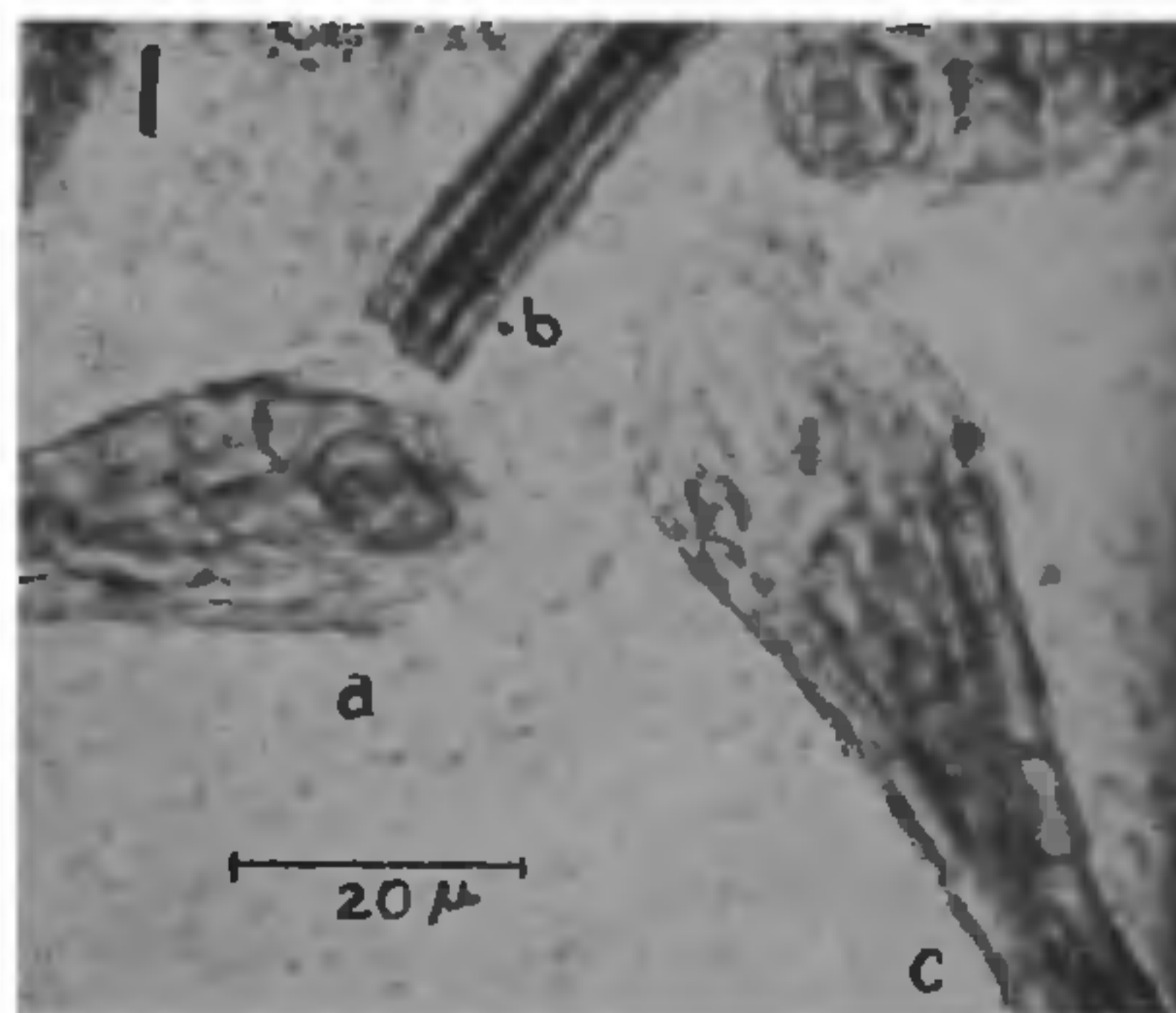


FIG. 1. Morphology of *Podoxyphium poonensis*. (a) Basal; (b) Median parts of the stipe and (c) Pycnidium with scattered spore-mass around.

Mycelium effusae, septatis, ramosis et anastomosis, 3-3.5 μ. lata, levibus, 9.5-15.2 μ intervallo inter septa. Stipe singula vel fasciculata ex hypharum erecta, simplicia, recta vel flexuosa, brunneae vel atro-brunnea, 7.6-11.4 μ lata, ad basi

11–15  $\mu$  inflata. Pycnidia superficialia recta, pallide-brunneis, stipitata, stipe magnit 174.8–228  $\mu$  forma, apiceum versus hyalina; Pycnidiosporae sessilis; continuae, hyalinae, ovoideae vel globosa, unicellularis, 1.5–2  $\mu \times 1 \mu$  [Herb. No. at M.A.C.S. AMH 2421 (Holotype), I.M.I. 186045].

Thanks are due to Prof. M. N. Kamat for his interest and to Dr. M. B. Ellis, C.M.I., Kew, England, for confirming the fungus identity.

M.A.C.S. Research Institute, V. SUBRAMONIAM,  
Poona-4, India, V. G. RAO.

January 15, 1975.

1. Batista, A. C. and Ciferri, R., *Quaderno*, 1963, 31, 162.
2. Sharma, K. R. *et al.*, *Norweg. J. Bot.*, 1973, 20 (1), 27.

#### A METHOD OF GETTING BACTERIA FREE CULTURE OF BLUE-GREEN ALGA *OSCILLATORIA*

DIFFICULTIES associated in obtaining bacteria free cultures of blue-green algae for critical physiological investigations are ably reviewed by Venkataraman<sup>1</sup>. Bunt<sup>2</sup> used aureomycin. Rubenchick *et al.*<sup>3</sup> also used several methods to get pure cultures of hormone forming blue-green algae.

Great difficulty was faced to get rid slimy *Oscillatoria* of bacteria which take shelter in mucilaginous sheath of the alga. The use of antibiotics, irradiation with UV along have been examined without success. We therefore, thought to remove the gelatinous sheath of the alga with some detergent of biological origin as it would not harm the cells of alga and at the same time loosen or remove the sheath surrounding trichomes of the alga.

40% solution of the soap nuts (fruits of *Sapindus laurifolios*) was prepared by boiling rinds of soap nuts in distilled water, squeezed and filtered. From this stock solution three dilutions were then prepared in the culture medium tubes (1:10, 1:100, 1:10000 V/V), sterilized and inoculated by small portion of the algal growth. Shaking the tubes with glass beads continuously for 30 minutes washing the algal mass three times successively in sterile medium under the aseptic conditions further loosen the sheath. A small portion of the inoculum from each tube was then irradiated under UV light of 160 nm for 10 minutes.

At the end of the irradiation period, a small aliquot was transferred into the sterile culture tube and also streaked on agar plate. Controls of untreated as well as only irradiated (without treatment with soap nuts) were simultaneously kept. The purity of culture was tested by transferring small portion of algal growth into the sterile nutrient

broth and incubated at 30° C. The absence of bacterial turbidity was taken as the criterion for purity of culture.

No turbidity was observed in the cultures treated with the soap nut dilutions of 1:10 and 1:100 with irradiation. But the treatment with soap nut solutions alone showed bacterial turbidity in these two dilutions also.

In a separate experiment the bacteria isolated from the algal association were treated in the concentration (1:10) of soap nut solutions for  $\frac{1}{2}$  hour. After the treatment the bacterial mass was centrifuged and was transferred in tubes of fresh sterile nutrient broth and incubated at 30° C.

No bacterial turbidity was observed in the tubes treated with 1:10 dilution of soap nut solution for  $\frac{1}{2}$  hour. This suggests the bactericidal action of soap nut to some extent and also that bacteria are more sensitive to the treatment when not associated with alga.

We are grateful to Prof. J. J. Chinoy, Director, for the facilities. This work is a part of the research project supported by the Department of Atomic Energy, India.

Botany Department, B. S. VAIDYA,  
University School of Sciences, VEELA B. MEHTA,  
Gujarat University,  
Ahmedabad-380009,  
India, February 19, 1975.

1. Venkataraman, G. S., In: *The Cultivation of Algae*, I.C.A.R., New Delhi, 1969.
2. Bunt, J. S., *Nature*, 1961, 192, 1275.
3. Rubenchick, L. I., Bershova, O. I. and Gidrobiol, Z. H., 1972, 8 (3), 114.

#### DEVELOPMENT OF SUBSIDIARY CELLS AND WATER LOSS IN *CROTALARIA* *MADICAGINEA* LAMK.

A KNOWLEDGE of water requirement of plants and their physical environment is necessary for understanding the adaptation of vegetation under stress conditions<sup>2</sup>. The present work shows the development of subsidiary cells as an adaptive feature and water loss in *Crotalaria medicaginea*, growing in Indian arid zone. Presence of two types of stomata in *C. medicaginea* has already been reported<sup>1</sup>. Stomata with and without subsidiary cells are present and the openings of the latter were less rhythmic than those of the former. Number of stomata with or without subsidiary cells per unit area decreases as the leaves mature (Figs. 1–2). In the early stages of leaf maturity, the number of stomata with subsidiary cells are less, but their proportionate numbers increase as the leaf attains maturity (Table I). Correlating these observations with water loss, the