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Effect of Climate on the Variation in Electro-Chemical Properties of Natural Humic Acids

Natural humic acid isolated from (1) Dehradun forest soil (pH 5·6), (2) Ooty non-forest acid soil (pH 4·7), (3) Bangalore red soil (pH 4·9) and (4) Nagpur black soil (pH 7·2) was subjected to potentiometric titration. The Nagpur soil humic acid showed greater buffer capacity upto pH 7, indicating abundance of COOH groups while the Ooty soil humic acid showed strong buffering beyond pH 8 showing the presence of phenolic OH groups. Humic acid from Dehradun and Bangalore soils, however, showed little variation in buffer capacity between different pH ranges (pH 4–7, 7–8 and 8–9). This suggests that the reactions, parent phenol → polyphenol → carboxyl, are occurring in these soils. Thus, the results indicate that the variations in the oxidation status of humic acid are largely dependent on the climatic conditions under which soil formation takes place.

TABLE I

Alkali required to titrate humic acids upto different pH levels

Place	Amount of alkali required (me. per 100 gm humic acid)		
	pH 4·0–7·0	pH 7·0–8·0	pH 8·0–9·0
Nagpur	27·3	9·6	..
Dehradun	10·6	7·3	9·0
Ooty	6·0	3·0	12·6
Bangalore	5·6	4·3	5·0

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A New Bacterial Disease on "Varalaxmi" a Hybrid Cotton

"Varalaxmi" cotton, a hybrid (*Gossypium hirsutum* ♀ × *Gossypium barbadense* ♂) was reported to be suffering from wilt disease. When such samples were examined they invariably showed vascular discolouration either in the form of disjointed streaks or contrinuous streaks extending from root region upto the stem. In some of the samples received later, there was hardly any discolouration in the vascular tissue of the stem and taproot, but it was noticed only in secondary and tertiary roots. Transverse sections of such roots did not show any vascular mycelium. From the samples examined, it appeared that plants of any age group are liable for infection.

Isolations from such discoloured vascular tissues, invariably, yielded a bacterial culture on Nutrient agar. Culture obtained from tissue isolation was further purified by dilution-plating, and culture from single well-isolated colony was transferred to sterile distilled water and maintained at 20° C for further studies. This culture was successfully used in artificial reproduction of the disease, by inoculating the injured side roots of 10 days old cotton seedlings, grown in sterile soil.

The bacterium makes dull white, slimy growth on NA. Bacterium is a short rod gram negative, non-acid fast, non-spore forming with a single polar flagellum. Bacterium does not hydrolyse starch, does not produce indole and H_2S. It does not produce fluorescent pigment on fluorescin medium[1] when observed under ultraviolet light, and makes fluidal opaque irregularly circular colonies, with slight pink colour at the centre on Triphenyl tetrazolium chloride medium[2].

Based on the morphological, cultural and biochemical characters, the organism under study has been identified as *Pseudomonas solanacearum* E.F.Sm., a new record on cotton. Studies are in progress regarding its relationship with other isolates of *P. solanacearum* from Potato, Tomato and Eggplant.

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Dept. of Plant Pathology, Univ. of Agril. Sciences, Bangalore 560024, *February* 12, 1975. V. V. SULLADMATH. R. K. HEGDE. B. G. PATIL KULKARNI. P. C. HIREMATH.

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Effect of Crowding on the Nymphal Duration of *Hieroglyphus nigrorepletus* Bol. (Orthoptera: Acrididae)*

Hieroglyphus nigrorepletus Bol. (Phadka grasshopper) is a pest of rice, millet, sugarcane and other crops in India. This pest is of considerable importance in the Tarai regions of Uttar Pradesh because of their abundance in this part of the country. The present writers consider it as '*monsoon enemy of man*' because they appear just after the

first monsoon showers in their breeding areas and start feeding voraciously on the seedlings of the crops and chop them off. Roonwal (1945) has studied the seasonal history of this pest at Banaras (Varanasi) but much attention has not been paid to the effect of crowding on the nymphal duration of this pest. Norris (1952) could not find any significant difference in the nymphal duration of *Schistocerca gregaria* Forskal when reared under isolated as well as crowded conditions, but the present writers have recorded a marked effect of crowding on the nymphal duration of *H. nigrorepletus* Bol. The nymphs of *H. nigrorepletus,* when reared collectively, completed their development in a shorter period of time as compared to those reared individually. This behaviour is of vital importance to this pest as it retains a solitary nature throughout its life-cycle.

The experiment on the crowding effect on nymphal duration was carried out with fifty freshly hatched nymphs which were reared at 32° C ± 2° C in each glass jar (15 × 10 cm). At the same temperature only ten hoppers were reared in a glass jar of the same size. Obviously the former batch of hoppers got less space in terms of per hopper space as compared to the latter batch of hoppers. Nymphs reared in crowded conditions took 35 to 45 days; but those reared under isolated conditions took 75·5 to 80·5 days in completing their development. The average nymphal duration under crowded and isolated condition has, therefore, been recorded as 40·0 and 80·0 days respectively.

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Reduction in Oil Content of Yellow Mosaic Infected Soybean Seeds

Like other plants soybean is afflicted with a number of virus diseases which cause disturbances in the host physiology. In the present study, the yellow mosaic disease of soybean, possibly caused by Mung bean yellow mosaic virus, was found to reduce the oil content of seeds in all the varieties tested.

Six varieties of soybean, *viz.,* Bragg, Clark-63, Lee, Amsoy, Picket and Local-2 were selected for oil estimation. For each variety two lots each of 20 seedlings were taken. One lot was treated with white flies (*Bemisia tabaci* Gennadius) fed on diseased soybean leaves. The other lot was left healthy. The plants were kept in insect proof conditions. When plants attained maturity their seeds were collected separately and their oil content estimated, using Soxhlet's method. The data are presented in Table I.

Table I

Oil content in healthy and yellow mosaic infected seeds of different varieties of soybean (data based on oil extracted from 4 g seeds under each treatment)

Varieties	Per cent oil content	
	Healthy	Diseased
Bragg	25·3	17·6
Clark-63	26·1	17·4
Lee	25·5	14·3
Amsoy	25·6	16·6
Picket	25·8	16·0
Local-2	21·4	11·8

The seeds from diseased plants contained less oil than the seeds from healthy plants. The varieties relatively more susceptible to the disease showed more marked reduction in oil content. Lee and Local-2 had maximum reduction while Bragg had least.

Harris *et al.*[1] reported that soybean infected with chlorotic mottle virus (soybean strain) had a reduced oil percentage in the seeds. Demski *et al.*[2] reported that tobacco ring spot virus infection reduced the palmitic, linoleic and linolenic acid proportions of the oil while stearic and oleic acids increased in soybean plants (Cv. Lee).

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