Narbada with the specimens from Andamans which are in the collection of the Zoological Survey of India, Indian Museum, Calcutta, does not reveal any significant differences between them. One variation noticed is that whereas the interorbital pores in the specimens from Andamans are indistinct,[1-2] they are quite distinct in the specimens from Narbada. The ventral fins are oval in the specimens from both the localities, although Koumans[1-2] stated that they are rounded in the specimens from Andamans. According to Koumans, the maxilla in this species extends to behind eye in males and to middle of eye in females; in the Narbada specimens, however, the maxilla extends only to below posterior third of eye in males and to below anterior third of eye in females. The scales before ventral fins are imbedded in the skin which can only be observed when a piece of the skin is examined under a binocular microscope. However, in the absence of any significant differences in the body proportions, meristic characters and colouration, the Narbada specimens cannot be treated as a separate subspecies in spite of the geographical separation.

I am grateful to Dr. A. P. Kapur, Director, Zoological Survey of India, for kindly sending me the specimens of *S. romeri* (*S. neglectus*) from Andamans for examination.

Central Regional Station, V. VISWESWARA RAO.
Zoological Survey of India,
Jabalpur, *November* 23, 1966.

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2. —, *The Fishes of the Indo-Australian Archipelago*, 1953, **10** (Gobioidea), 113, Fig. 26.
3. Mukerji, D. D., *Rec. Indian Mus.*, 1935, **37** (3), 268, Pl. 6, Figs. 3-4.

BACTERIAL BLIGHT DISEASE OF *CYNODON DACTYLON* PERS.

Cynodon dactylon, a perennial grass commonly known as Hariali, is extensively used as green fodder for cattle in Western India. A bacterial disease which is systemic in the vascular strands was noticed during the rainy seasons of 1963-66 in South Gujarat. The disease is easy to recognise, since by sectioning the infected portions, the bacterial ooze from the vascular strands becomes quite conspicuous.

The disease first appears as water-soaked, translucent, linear, pale yelow to dark green streaks, running parallel to the leaf veins or along the midrib of the lamina. When the infection is heavy, several streaks coalesce and develop into brown, translucent lesions measuring about 1 cm. long.

Isolation of the disease-inciting pathogen was done by both the streaking and the dilution poured plate techniques using potato dextrose agar medium. Inoculation experiments were carried out on both the young and mature plants of *Cynodon dactylon*. Typical disease symptoms were obtained, and the bacterium reisolated from the artificially inoculated leaves corresponded in all its characters with the pathogen isolated from the natural lesions. Cross-inoculation experiments carried out on *Eleusine coracana* Gaertn, *Oryza sativa* L., *Panicum miliaceum* L., *Paspalum scrobiculatum* L., *Sorghum vulgare* (L.) Pers., *Setaria italica* Beauv., *Pennisetum typhoideum* Rich., *Zea mays* L., *Triticum æstivum* L., *Hordeum vulgare* L., and *Avena sativa* L., showed that these were not susceptible. The morphological, cultural and physiological characters of the pathogen undoubtedly place it in the genus *Xanthomonas*. The pathogen under study differs from *Xanthomonas translucens* in its host range and a few biochemical characters. It is, therefore, proposed to name the pathogen as *Xanthomonas cynodontis* nov. sp., whose technical description is as follows:

Short rods with rounded ends, usually single, occasionally in pairs, measuring $1 \cdot 1-1 \cdot 8 \times 0 \cdot 5-0 \cdot 7$ microns, motile by a polar flagellum, Gram-negative, encapsulated, no endospore and non-acid-fast. Colonies on potato dextrose agar plates are circular with entire margin, smooth, pulvinate, butyrous and glistening yellow. Growth on potato dextrose agar slants is abundant, filiform, convex, glistening, smooth, opaque, butyrous and lemon yellow; medium unchanged. On nutrient agar slants, growth is moderate, filiform, convex, glistening, smooth, opaque, butyrous and lemon yellow; medium unchanged.

Gelatin liquefied, starch hydrolysed, casein digested, tributyrin and several other fats hydrolysed, milk peptonised and litmus reduced; ammonia and hydrogen sulphide produced from peptone; nitrates not reduced to nitrites; indol not produced; V.P. and M.R. tests negative; citrates utilised but not uric acid; tolerates 3% sodium chloride; acid without gas from arabinose, xylose, glucose, fructose, galactose, mannose, lactose, maltose, sucrose, cellobiose, glycogen, dextrin, and mannitol but not from rhamnose, inulin, salicin, sorbitol, dulcitol, and inositol. Seventeen amino-acids supported growth as source of nitrogen while DL-serine, DL-nor-leucine and L-tyrosine failed to do so.

DL-alanine, L-glutamic acid, L-proline and L-hydroxy-proline supported growth while sixteen other amino-acids failed to support growth as source of carbon. Catalase positive; facultative aerobe; optimum temperature for growth 27–30° C: thermal death-point 53° C.

Pathogenic to *Cynodon dactylon* only, producing blight on leaves; found at several places in South Gujarat.

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EFFECT OF SOME ALIPHATIC ACIDS ON THE GERMINATION OF PEA POLLEN

DURING recent years, investigations regarding the effect of amino-acids, vitamins and growth harmones on pollen germination and pollen tube growth have received considerable attention.[1] The role of the aliphatic acids in these processes, however, has remained unexplored. We, therefore, tried to determine the effect of a few aliphatic acids on the germination and tube length of the pollen grains of pea (*Pisum sativum* L.).

TABLE I

*Showing the germination percentage and pollen tube length in sugar-agar medium supplied with varying concentrations of different acids**

Acids used		Concentrations of acids used			
		0·001%	0·002%	0·003%	0·005%
Citric	*a*	48	40	27	18
	b	320	400	560	64
Malic	*a*	49	50	45	20
	b	240	240	288	480
Tartaric	*a*	75	71	42	21
		240	560	480	112
Amino-acetic	*a*	83	90	78	70
	b	320	480	400	400
Oxalic	*a*	92	71	42	22
	b	320	640	720	320
Control†	*a*	78			
	b	240			

a = average percentage of pollen germination. *b* = average pollen tube length in microns.

* Experiments were performed at room temperature (21°–23° C.). † Control medium consisted of 27·5% sucrose + 1% agar in redistilled water.

The data, presented in Table I, clearly indicate that three of the five acids, *viz.*, Citric, Tartaric and Malic appear to inhibit pollen germination even in minute concentrations, whereas, Oxalic and Amino-acetic acids accelerate germination when present in very low concentrations (0·001% or up to 0·002%). The latter also inhibit it in higher concentrations. One particularly noteworthy feature of this study is that though these aliphatic acids are inhibitory to pollen germination, they greatly enhance the pollen tube growth. The pollen tubes are about three times longer in the medium containing 0·003% oxalic acid than the pollen tubes formed in the basic control medium.

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Dept of Botany, Univ. of Lucknow, Lucknow (India), *October* 18, 1966. B. S. TRIVEDI. PRAKASH CHANDRA SHARMA.

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EFFECT OF FUSARIC ACID ON *IN VITRO* CULTURE OF EMBRYOS OF *PHASEOLUS VULGARIS* L.

THE study of plant toxins is gaining importance as a tool in unravelling the host-parasite relationships in phytopathology. The toxins of fungal origin are of special interest since a large number of plant diseases are caused by fungi. Fusaric acid (FA) is a toxin of known chemical structure produced by species of *Fusarium* and *Gibberella*. It is known to be a non-specific toxin interfering with the chelation of heavy metals like iron and copper and affecting the water permeability of the host protoplasts (Tamari and Kaji, 1954; Gäumann, 1958). It was thought that a study of its action on meristematic plant tissues grown in sterile culture would yield useful results. A preliminary study was made on embryos of *Phaseolus vulgaris* grown on Nitsch's (1951) basal medium supplemented with vitamins (NBV). FA was added to the basal medium in concentrations of 0·25 mg./l.; 0·75 mg/l. and 1 mg./l: The pH was adjusted to 5·6. Embryos were selected from mature green pods and planted in the medium after the removal of cotyledons. Controls were grown without the addition of FA.

The embryonal axes grown on medium containing 0·25 mg./l. of FA increased in size on the fifth day after inoculation and the root and shoot meristems started functioning. The hypocotyl indicated normal growth and elongation. However, fifteen days after inoculation the lower part of the hypocotyl started callusing (Fig. 1). After 35 days' growth the first pair of leaves failed to enlarge whereas controls developed plantlets with 3 or 4 nodes (Fig. 4)