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.

B.P. Baria Science Institute, Navsari, Gujarat, *October* 17, 1966. S. G. DESAI. M. K. PATEL. A. B. GANDHI. W. V. KOTASTHANE.

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.

The authors thank the State Council of Scientific and Industrial Research, U.P., for financial assistance for the research project.

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

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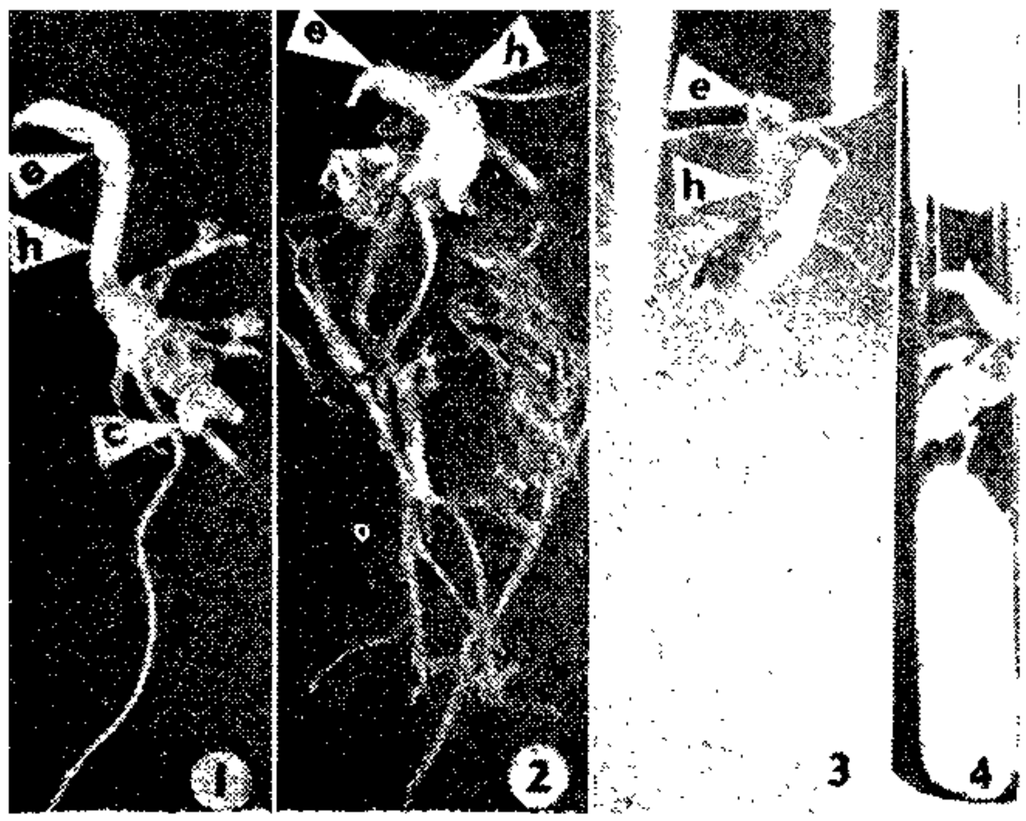
EFFECT OF FUSARIC ACID ON *IN VITRO* CULTURE OF EMBRYOS OF *PHASEOLUS VULGARIS* L.

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)

in the same period. The shoot bud wilted and dried up after 40 days and the roots were not numerous. Cultures grown with the addition of 0·5 mg./l. of FA exhibited a more or less similar course of development. Concentrations of 0·75 mg./l. and 1 mg./l. inhibited the growth of shoot buds very early. In these cases the embryos indicated a stunted shoot bud. However, the hypocotyl enlarged and its lower end was ruptured due to the development of roots. In about ten per cent of the cultures grown on 1 mg./l. concentration of FA the first leaves of the epicotyl expanded but ultimately wilted and dried up. The root system in such cases was not well developed and the rootlets were not produced (Fig. 3).



FIGS. 1–4. Fig. 1. 15-day-old embryo axis of *P. vulgaris* grown on medium containing 0·25 mg./l. of FA, × 1. Fig. 2. Embryo axis grown on medium containing 0·75 mg./l. of FA, × 1. Fig. 3. Wilting of leaf in culture grown with the addition of 1 mg./l. of FA, × 1. Fig. 4. Control grown on NBV without the addition of FA, × ¼. *h*-Hypocotyl ; *e*-Epicotyl ; *L*-Wilted leaf.

The results of this study indicate that in low concentrations FA induces callus formation while at higher concentrations the marked effect was inhibition of shoot growth. The wilting of the first leaves produced by a small percentage of cultures is associated with the scanty development of rootlets and hence the slow movement of FA into the shoot. But when the roots elongate FA may be transported to the leaves which ultimately wilt and dry up.

I am grateful to Professor T. S. Sadasivan for facilities and encouragement.

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December 3, 1966.

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A NOTE ON CYCOCEL (2-CHLOROETHYL TRIMETHYL AMMONIUM CHLORIDE), A NEWLY RELEASED PLANT GROWTH REGULANT

CYCOCEL, a newly released plant growth regulant, is indicated to produce unusual and varied responses on a wide range of plant species. The nature and behaviour of this growth regulant and its possible applications in crop production are yet to be fully evaluated. Hence it was of interest to study the effects of this chemical on plant growth and development using beans (*Phaseolus vulgaris*) as the test plant.

Effect of Cycocel on Germination of Seeds and Rooting.—Fifty bean seeds were placed on paper towels completely wetted with 100 p.p.m. of cycocel solution, for germination. This facilitated continuous contact of seeds with the chemical throughout their period of germination and rooting. Simultaneously placed bean seeds on paper towels wetted with distilled water provided the needed controls for comparisons to be made. Observations made revealed that cycocel does not affect (*a*) germination, (*b*) rooting and (*c*) formation of root hairs. However, elongation or extension of top and lateral roots was considerably reduced. Profuse formation of laterals and their early initiation in seeds germinating on paper towels soaked with cycocel were noteworthy. Since seeds germinated and roots were initiated, it is reasonable to assume that the chemical does not affect early cell division, multiplication and differentiation. The early initiation of laterals and thickening of roots probably reflect acceleration of differentiation and maturation of cells and tissues in roots. The effect of cycocel on length of roots and number of laterals produced is summarised in Table I.

TABLE I

Treatments	Length of tap roots (in cm.)	Length of laterals (in cm.)		No. of lateral roots present
		Max.	Min.	
Cycocel ..	4·6	3·8	1·1	2
Control ..	9·8	4·4	1·5	7

Note : The data represent one taken on 5th day after commencement of the experiment and an average from 56 germinated seeds in each case.

Effect of Cycocel on Emergence, Early Growth and Development of Seedlings.—Wooden flats of 18" × 13" × 3½" filled with approximately ¼th c.ft. of potmixture were treated with 250 ml. of 5000 p.p.m. of cycocel, applied as a soil surface