C. pseudotuberculosis was isolated from the stomach contents and heart blood of one mouse and the stomach contents only in the other. Toxin production was then attempted[8]. The toxin thus produced from each strain was separately inoculated in 0·1 ml volume intravenously into 2 mice which did not die in 10 days.

The colonial characters of the two isolates, as mentioned earlier, were suggestive of the organisms being varients of *C. pseudotuberculosis*[2]. The negative reaction on nitrate shown by the isolates indicated these to be ovine strains of the organisms[5]. *C. pseudotuberculosis* is known to cause infection in sheep and horses. However, its primary role in causing abortion in the mare has not been observed. The two isolates appear to be non-toxigenic ovine strains of *C. pseudotuberculosis*. The role of such strains in equine disease is not well understood.

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INDUCTION OF RHIZOGENESIS BY CAFFEIC ACID IN MAIZE STEM SEGMENTS

ALTHOUGH the physiological effects of naturally occurring phenolic acids are well documented[1,2], their mechanism of action is not understood. It has been suggested that phenolic acids affect plant processes by regulating the transport and metabolism of auxins[3,4]. Consistent with this suggestion, Basu *et al*[5] observed significant stimulation of indole acetic acid (IAA) synthesis by caffeic acid in *Phaseolus vulgaris* (french bean), *P. aureus* (mung bean) and *Ipomaea carnea*. Caffeic acid acted synergistically with the IAA in the growth of *Avena* coleoptile[6]. To examine whether the caffeic acid mimics some other known effects of IAA in maize segments, the present investigation was undertaken.

Experimental

Seeds of *Zea mays* L. cv. Ganga safed −2 were surface sterilised with 0·1% $HgCl_2$ for about two minutes, washed with water and then planted on moist filter-papers. The seedlings were raised for 5 days in dark at 25 ± 2° C. The coleoptile and stem segments (mesocotyl) were exercised aseptically from uniformly grown seedlings and were floated on the desired concentration of caffeic acid at 25° C in light. To prevent bacterial contamination, about 2–3 drops of chloramphenicol (1 mg/ml) were added. Further, for experiments with rhizogenesis, the solutions were changed every 24 hr. The pH in each case was 6·0 and about 6 to 10 stem segments were floated in each treatment. Ethanol-soluble and proteinous nitrogen in the coleoptile segments were determined according to an earlier procedure[7].

Results and Discussion

As shown in Table I, caffeic acid in a concentration range of 1 to 500 μM enhanced (statiscally significant) rooting in maize stem segments. However, higher concentration (1000 μM) had no effect. In the traditional materials used for rooting studies such as beans, caffeic acid synergizes with IAA and tryptophan in inducing rhizogenesis, although it has no effect in *Ipomaea*[5].

TABLE I

Effect of caffeic acid on rooting in stem segments (after 5 days of incubation) and growth of coleoptile (after 24 hr of incubation) in maize. The data presented are average of duplicate experiments

Concentration of caffeic acid, μM	Stem segments: Segments bearing roots, %	Stem segments: Average number of roots per segment	Coleoptile growth: Increase in fresh weight %	Coleoptile growth: Increase in length %
0	16·6	2·5	13·7	12·0
1	58·5	5·0	17·7	22·0
20	66·6	4·8	17·6	24·5
100	66·6	3·6	17·3	29·5
500	50·0	4·5	17·0	29·0
1000	16·6	2·5	17·2	34·5

In another experiment, the length of maize coleoptile was significantly enhanced by caffeic acid, although the fresh weight was less enhanced (Table I). Further, the short term responses of increase in fresh weight,

as is observed with IAA in other systems[8] was not seen in the present investigation. The elongation of *Avena* coleoptile by IAA is believed to involve an increase in cytoplasmic protein synthesis. However, in the present study, the levels of ethanol-soluble and proteinous nitrogen in the coleoptile segments were not affected by various concentrations of caffeic acid. These observations demonstrate that the effect of caffeic acid on increase in the length of maize coleoptile is not *via* IAA. Extrapolating these observations, it may also be concluded that induction of rhizogenesis by caffeic acid is independent of IAA action.

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AN UNRECORDED FRUIT ROT OF ORANGE (*CITRUS RETICULATA* BLANCO)

DURING frequent surveys of Kurukshetra market in December, 1978–January, 1979, a new fruit rot of orange (*Citrus reticulata* Blanco) was observed which caused severe storage losses of orange fruits. The symptoms started in the form of light brown colored water-soaked lesions changing to brown colored spots, 1–2 cm in diameter. After one week the whole of the infected portion was covered with creamish white fluffy mycelium.

Isolations were made on Potato Dextrose Agar and the fungus was identified as *Acremonium cymosum* W. Gams. Colony on P.D.A. growing luxuriantly, white; vegetative hyphae hyaline, septate, 2·5–3 μm wide; condiophores simple phialides, hyaline arising laterally from hyphae, subulate, 10–15 μm long, 3–4 μm wide at the base; conidia hyaline, slimy, produced in globose heads, 15–30 μm in diameter, smooth walled, ovate showing slight curvature in the centre, unicellular, 6·5–16·8 × 3–4·5 μm.

Pathogenicity test was performed by inoculating the healthy orange fruits by the method given by Granger and Horne[1], Koch's postulates were fully satisfied. The identity of the culture has been confirmed from Centraalbureau voor Schimmetcultures, Baarn, Netherlands.

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INTERCHANGE HETEROZYGOSITY IN *HEMEROCALLIS* LINN.

CONFIGURATION involving more than two chromosomes in otherwise, a diploid taxon is an indicator of an interchange hybridity. One such case has been discovered in a diploid cultivar of *H. fulva* (Specimen No. 1/4).

Male meiosis of this taxon was characterised by the presence of an interchange multiple—a ring or chain of four chromosomes plus 9 II at meiotic metaphase I. An analysis of 50 cells has been presented in Table I. As evident from Table I, the majority of the interchange multiples are rings (88·0%) and 12·0% are chains. Further rings were also observed disjuncting both alternate (24 ± 0·71) and adjacent (64·0±0·3, Fig. 1) while the chains showed only adjacent orientation.

Chiasmata frequency ranged from 14·8±0·81 to 18·3±0·3 and an average being 16·5±0·39 per cell. Out of this only 8·6% chiasmata were terminalised giving a terminal coefficient of 0·61. An analysis also indicates that the ring multiples had 4 chiasmata all being interstitial. The consistent occurrence of interstitial chiasmata, in the ring multiples seems to delay chromosome movements resulting late disjunction of the ring interchange multiples at A I (Fig. 2). The chromosome segregation at Anaphase I and Anaphase II and subsequent course of meiosis was found to be regular. However, the taxon had yielded only 40 per cent stainable pollen grains.

The reduced fertility of this heterozygote seems to result from the higher frequency of adjacent orientations and/or the presence of interstitial chiasmata in the interchange multiple[1].

The nature of chromosomal heterozygosity could not be detected karyotypically, as there were 11 homomorphic pairs in the somatic complements.