are given. It appears that a straight line can be fitted by eye examination to the points shown for the tests at both 14·5 and 16° C, even though as indicated by the dotted lines drawn through the values for *Tilapia* a split probit also could be indicated at 14·5° C. It is possible that in both species low temperature deaths are complex, being caused by more than one factor.

While information on the mechanism is itself of much value it may be pointed out that the differences in temperature tolerance and resistance among fishes, such as those shown here distinguishing *L. macrolepis* and *T. mossambica*, have been made use of as 'tools in taxonomy' in distinguishing taxonomic groupings.[3]

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INFLUENCE OF ANTIBIOTICS AND pH OF PHOSPHATE BUFFER ON THE GERMINATION OF *BOTRYTIS* SPORES

AFTER detection of a phytoalexin type of reaction in the *Botrytis* infection of leaves of bean (*Vicia faba* L.)[1,2] it was thought worthwhile to investigate whether any bacterial product in the 'diffusate' was responsible for the inhibition of growth of the said pathogen. Initially an experiment was designed with a view to ascertain those concentrations of antibiotics which would not affect the germination of spores of *B. fabæ* and *B. cinerea* but would inhibit the growth of bacterial population in inoculum drops during incubation period. Besides, another experiment was also conducted to determine the optimal pH of phosphate buffer for the germination and germ tube growth of the test fungi.

Three different concentrations of streptomycin, aureomycin and chloramphenicol were prepared in sterile distilled water. They were diluted to 100, 200 and 400 p.p.m. by adding equal volumes of standardized spore suspension of either *B. fabæ* or *B. cinerea* prepared from 10 days old cultures grown on 'X' medium (10 gm. dextrose, 2 gm. peptone, 1·52 gm. KH_2PO_4, 6 gm. $NaNO_3$, 0·52 gm. $MgSO_4.7H_2O$, 0·52 gm. KCl, 3 gm. caseinhydrolysate (acid), 0·5 gm. yeast nucleic acid, 20 gm. agar agar, 1000 ml. distilled water). The spore suspensions were prepared following the method suggested by Deverall and Wood.[3] Four drops (20 μ l./drop-500 spores) of each concentration of antibiotic were placed on two clean slides on glass rods over moist filter-paper in a plastic box ($7'' \times 4\frac{1}{2}'' \times 1\frac{1}{2}''$) fitted with a lid. The lids of boxes were sealed with vaseline to reduce drying out of the drops and then incubated for 24 hrs. at 15–17° C. in 250 f.c. light. After incubation period, the spores were stained with 0·05% lactophenol-cotton blue and examined.

To determine the optimal pH for germination and growth of *Botrytis* spp., solutions with different pH values ranging from 5 to 8 were prepared by mixing appropriate volumes of KH_2PO_4 and K_2HPO_4 at a concentration of 0·01 M. This molarity was chosen as the highest favourable for unimpaired germination and germ tube growth of both fungi when their spores were tested in concentration of phosphate ranging from 1 M–10^{-3} M at pH 6. In this case germination was tested using hanging drop method. The spores were incubated for 24 hrs. keeping other conditions same as described earlier. The rate of spore germination of *B. cinerea* was found greater than *B. fabæ* in all the molar concentrations used. The germination rate of both fungi, however, declined in 10^{-1} M but markedly decreased at a concentration of 1 M.

The effects of different concentrations of antibiotics and pH range of phosphate buffer on the spore germination of the two species of *Botrytis* have been included in Tables I and II.

The germination rate of *B. cinerea* has been found to be much higher than that of *B. fabæ*. This result, however, substantiates the earlier findings of Deverall and Wood[3] who used the detached leaves of bean (*Vicia faba* L.) as media for spore germination of *Botrytis* spp. It appears from Table I that chloramphenicol 100 p.p.m. has little effect on germination of

TABLE I

Effects of different concentrations of antibiotics

Treatment	Concentration (p.p.m.)	% germination	
		B. fabæ	*B. cinerea*
Sterile water (control)	..	56·19 (1178–662)*	100 (870–870)
Chloramphenicol	100	53·86 (1190–641)	100 (1000–1000)
	200	50·43 (1043–526)	100 (1057–1057)
	400	47·08 (1202–566)	100 (1079–1079)
Aureomycin	.. 100	34·55 (1308–452)	24·19 (963–223)
	200	29·53 (1432–423)	3·54 (903–32)
	400	0 (1350–0)	2·99 (1034–31)
Streptomycin	.. 100	4·87 (1457–71)	0 (1067–0)
	200	0·75 (1330–10)	0 (1115–0)
	400	0·70 (1562–11)	0 (1053–0)

* No. of spores found—No. of spores germinated.

TABLE II

Effect of pH of phosphate buffer

pH	*B. fabæ*		*B. cinerea*	
	Germ tube length* (μ)	% germination†	Germ tube length* (μ)	% germination†
5	121·05	69·50 (305–212)	98·56	93·39 (454–424)
6	168·07	73·94 (380–281)	124·17	97·88 (331–324)
7	116·05	45·77 (308–141)	117·15	96·61 (532–514)
8	41·39	9·91 (343–34)	85·12	74·63 (339–253)

* Average length of germ tubes based on 60 spores.
† No. of spores found—No. of spores germinated.

B. fabæ and none on that of *B. cinerea*. But similar concentration of chloramphenicol can check the growth of a large number of bacteria in the inoculum drops. Streptomycin and aureomycin prevent the germination of both fungi to a considerable extent but *B. cinerea* seems to be more sensitive. Of the three antibiotics tested, 400 p.p.m. streptomycin is most effective in inhibiting the germination of test fungi as well as bacterial growth.

It is evident from Table II that both fungi germinate well between the pH 5–6. Although *B. cinerea* spores germinate over a wide range of pH values from 5–8, *B. fabæ* shows abrupt fall in the germination rate above pH 7. The growth of germ tubes was also affected in a similar way to germination by different pH conditions.

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CHENOPODIUM PUMILIO R.Br.—AN ADDITION TO THE INDIAN FLORA WITH AN ENLARGED KEY TO THE SOUTH INDIAN SPECIES OF THE GENUS

THE genus *Chenopodium* L. (Chenopodiaceæ) is so far known to be represented by eight species in India,[2-5] of which three occur[2-4] in South India (region below Vindhyans). The species now identified as *Chenopodium pumilio* R.Br. was collected on June 1, 1968, from near Coonoor Railway Station, Ootakmund (Madras State). The plant grows in thin, narrow matrices along the rails and is so small and firm in the ground that it cannot be easily pulled out with hands. It is said to be a native of Australia and nearby regions[1] and hence an alien in this country. In the authors' knowledge, this species has so far been not recorded from India and hence an illustrated account of it is presented here, along with an enlarged key to the four species (including the present one) of the genus occurring in the South. The data bracketted in the description given below is after Brenan.[1]

Chenopodium pumilio R.Br., *Prodr. Fl. Nov. Holl.*, 1 : 407 (1810) ; Benth., *Fl. Austral.*, 5 : 163 (1870); Brenan, *Fl. Trop. East Africa* : 13 (1954). Type : Australia, R. Brown (BM, holo. K, iso. !).

A prostrate herb with radiating stems from the root ; stems branched or unbranched 2–30 cm. long (–45 cm.), green (rarely red-tinged), pubescent with cylindrical hair and capitate vesicular hair (*see* below for detail), aromatic. Leaves alternate, elliptic to lanceolate, small with coarse obscure teeth at