

from *Nema*-pot succumbed, and from the mixture one out of 9 died after a lapse of one month. Isolations gave identical organisms from dead plants.

4. Only *Macrophomina* was used in the same manner with two controls. Temperatures of the tanks ranged between 35°—42° C. Out of the 25 seedlings from 5 pots 14 died of rot from one tank and out of the 23 from the second tank 8 died after a lapse of one month. Isolations gave pure cultures of *Macrophomina* and there were no deaths in the controls.

The infective capacity of *Macrophomina* and *Nema* became established thus under certain temperature and humidity conditions of the soil. No sooner these conditions disappear the organisms tend towards saprophytism in the soil (see Fig. 2).

In all the above experiments water from the well with pH 8 was used. The tendency of the *Fusarium vasinfectum* form (pH 5.4) being towards acidity while that of *Nema* and *Macrophomina* was towards alkalinity as observed from cultural filtrates (pH 7.6—8.0). The soil reaction ranged from neutral to alkaline and compares with the pH ranges for the two infective organisms. The action of the irrigated water as compared to the rain water may also be taken into consideration.

In view of the results obtained, in addition to the study of resistant and immune strains to rot, control measures are being developed, involving soil disinfections, manual and change of sowing date trials.

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#### On the Introduction and Spread of *Euphorbia geniculata*, Orteg. in South India.

In June 1933 I found several specimens of a species of *Euphorbia* growing in cultivated ground in Kengeri (9 miles from Bangalore). A little later I found the same plant growing as a weed in Bangalore. Being unable to identify it with the help of Indian floras I sent specimens to the Calcutta Herbarium and to Kew. Both Mr. Biswas and Mr. Fischer identified the plant as *Euphorbia geniculata*, Orteg. a native of Tropical America.

After making numerous enquiries I eventually came across an old gardener in the

Government Gardens at Bangalore who told me that he clearly remembered that when Mr. Stephen first came to the Lalbagh he brought with him a pot of this plant and another containing a variety of *Capsicum*. Both plants grew well and set seed in Bangalore. The *Capsicum* became a popular garden plant for some years but appears to have now died out. The *Euphorbia* was also planted in gardens and soon established itself as a garden escape. Mr. Fischer tells me that Mr. John Horne Stephen came out to the Lalbagh gardens from Kew in 1891 as Assistant to Mr. John Cameron but soon left having obtained the appointment of Superintendent of the Government Gardens, Nagpur.

*Euphorbia geniculata* is a pretty plant suitable for edging in gardens although the original scarlet coloration of the leaves has been lost except occasionally when it grows in exposed situations. It produces enormous numbers of minute seeds and its spread is doubtless due to this fact. It cannot at present be regarded as a serious pest but it is becoming a troublesome weed in gardens and cultivated land.

With Bangalore as its starting point this plant has proceeded in various directions over many miles of Mysore State. It has advanced to Devanahalli on the north and to Hoskote on the north-east. On the east it has proceeded to Whitefield and on the south-east to Anekal. It has gone as far as Kankanhalli on the south and to the hamlet of Gangenhalli on the west. On the old Madras road it has reached the British town of Hosur. Last May I saw it established at Nanjangud, over one hundred miles from Bangalore. Recently it has made its appearance in the city of Madras, having established itself on a piece of vacant land near to the Government Royapettah Hospital.

The leaves of *Euphorbia geniculata* have been widely known as a purgative for many years among the poorer classes in and around Bangalore. The credit of the discovery goes to a gardener in Bangalore who in the earlier years of its introduction ate it as a pot-herb and experienced violent purging as a result. It is interesting to note that even to-day this purgative is taken always mixed with food.

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