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EFFECT OF MORPHACTINS IT 3233 AND IT 3456 ON POLLEN GERMINATION AND TUBE GROWTH IN *ASCLEPIAS CURASSAVICA* L.

MAMATHA RAO
Department of Botany, Bangalore University, Bangalore 560 056, India.

MORPHACTINS (chlorofluorenol esters) are synthetic growth regulators and show a very pronounced inhibitory effect on the growth and development of higher plants often resulting in malformed and dwarf plants. Morphactins affect seedling growth[1–3] and shoot extension[4,5]. They have a retarding effect on the pollen tube growth in *Nicotiana rustica*[6] and *Trigonella*[7] but not on tomato pollen[8]. Morphactins CME and EMD promote pollen tube elongation in *Arachis hypogaea* but at different optimum concentrtations[9]. The present work is on the effects of two morphactins IT 3233 (*n*-butyl-9-hydroxy-fluorene-(9)-carboxylate) and IT 3456 (methyl-2-chloro-9-hydroxyfluorene-(9)-carboxylate) on pollen germination and tube growth in *Asclepias curassavica* L.

Pollinia of *A. curassavica* were dissected out from fresh flowers and incubated in a basal medium (BM) of 0·3 M sucrose (control) at 26 ± 2° C. The morphactins were added to the BM at concentrations of 0·5 to 50·0 μg/ml (figure 1). Growth was arrested using formalin at the end of 24 hr. Pollen showing a tube length of more than their equatorial diameter was considered as germinated and the tube length was measured using an occular micrometer. Five replicates of 10 pollinia each and 100 pollen/pollen tubes were studied.

The results obtained are shown in figure 1. IT 3233 retarded germination at 0·5 μg/ml. At 1·0μg/ml, germination was slightly greater than that in the control but rapidly declined at higher concentrations. Tube growth was about the same as in the control at 0·5 μg/ml and 5·0 μg/ml but declined at higher concentrations. At 1·0 and 2·0 μg/ml, tube growth was higher than in the control. Thus IT 3233 exhibited promotory effects on both germination and tube growth at an optimum concentration of 1·0 μg/ml. IT 3456 had a retarding effect on germination but tube growth was at about the same levels as in the control. The two morphactins used thus had different effects on germination and tube growth.

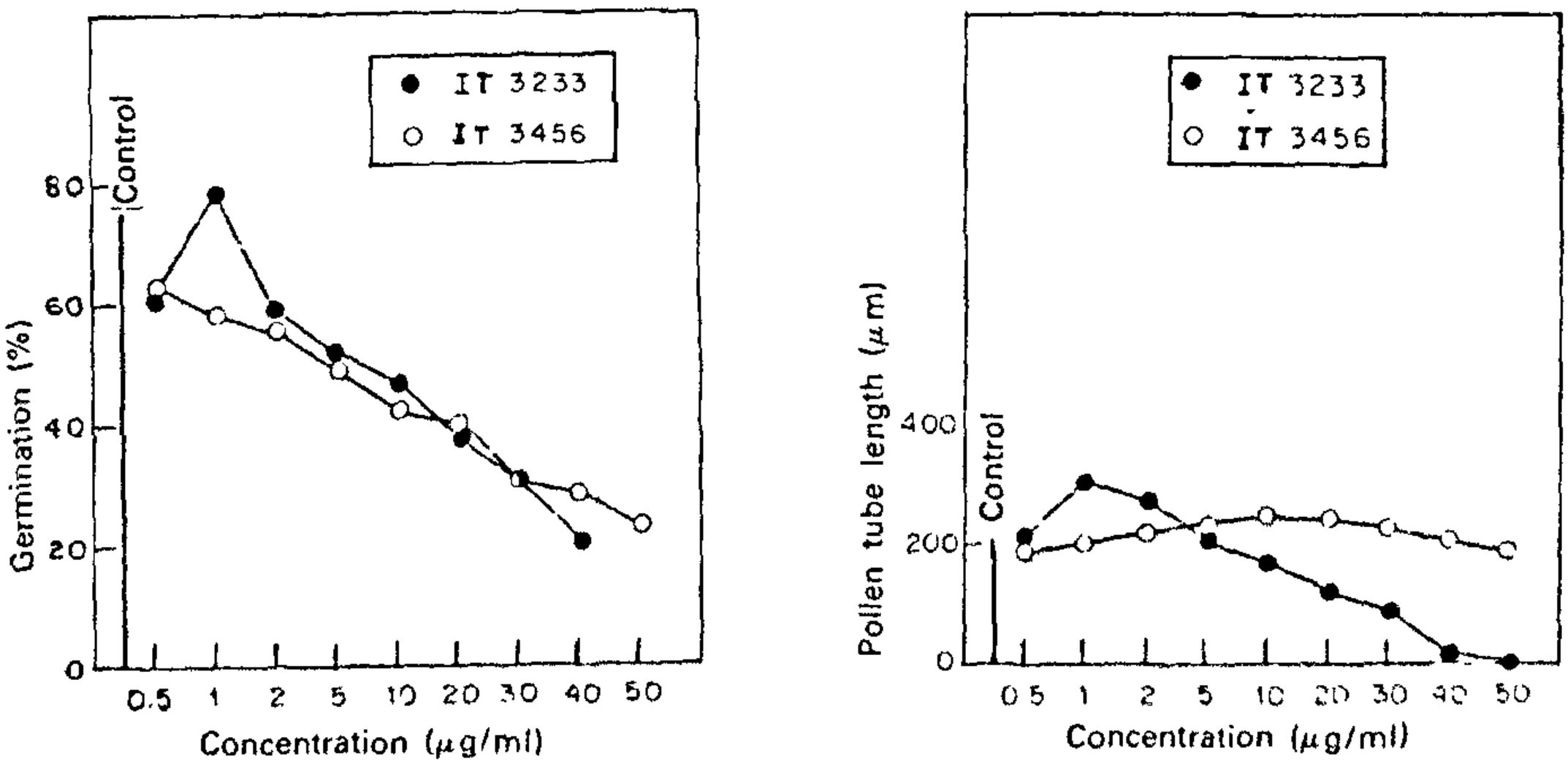

Figure 1. Effect of morphactins on the percentage of germination and pollen tube length.

The effects of each morphactin on pollen germination and tube growth were also not identical. A number of physical and chemical treatments on *A. curassavica* have shown that pollen germination and tube growth are two different aspects with different physicochemical requirements[10].

Studies with morphactins indicate that many of the effects could be explained, at least partly, in terms of their influence on auxin transport [11–13]. Morphactins were shown to affect polar auxin transport[14, 15], although the exact mode of this action was not clear. In some cases morphactins seem to block basipetal auxin transport without affecting acropetal transport[14–17]. However, in the present study both the morphactins used seem to affect even acropetal transport of auxin at higher concentrations.

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EFFECT OF ANTIBIOTICS ON THE GROWTH OF *HYPNEA VALENTIAE* (TURN.) MONT. (GIGARTINALES, RHODOPHYTA)

R. RENGASAMY, M. PREMA,
S. GOVINDARAJAN and K. ILANCHELIAN
CAS in Botany, University of Madras, Madras 600 025, India.

THE Carrageenophyte of *Hypnea valentiae* (Turn.) Mont. was collected from Muttukadu (near Madras) and studied under laboratory conditions (26 ± 1°C, 1.5 lux illumination and 12/12 light-dark regime) in F medium[1]. Red algae growing under laboratory conditions are contaminated by diatoms and blue-green algae[2]. Growth of diatoms was suppressed by treating with 2 ppm GeO_2 in the basal medium for a week and then transferring the alga to fresh medium[3]. Blue-green algae growing on the marine red and brown algal cultures were eliminated by using antibiotics[4].

In the present investigation, an attempt is made to eliminate blue-green algal contaminants on *H. valentiae*. Benzyl penicillin at higher doses (4000 ppm) along with other antibiotics is reported to be toxic to the growth of cyanobacterium *Gloeocapsa* (*Gloeothece*) sp[5]. The alga *H. valentiae* was grown in basal medium with antibiotics at 4000 ppm of benzyl penicillin, 2000 ppm of chloramphenicol and 2000 ppm of streptomycin and exposed to light at different time intervals. After treatment, the alga was sub-cultured on a fresh medium and the growth characteristics recorded after two weeks (table 1). Blue-green algal contaminants were eliminated without inhibiting the growth of *H. valentiae* by exposing to light for one hour with 2000 ppm of chloramphenicol or streptomycin in the basal medium. Benzyl penicillin exerted an inhibitory effect equally on blue-green contaminants and *H. valentiae*. The mechanism by which it inhibits the growth of the organisms is not presently understood. The blue-green algae and *H. valentiae* showed better growth under 24 hr dark treatment of these antibiotic concentrations. Bacteria survived in all experiments.

To understand the effect of antibiotics on the growth of the alga, different concentrations of