TECHNICAL PAPERS

Effect of Crude Polyporin on Seed Germination and Root Growth: A Preliminary Study

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Germination experiments with gram (*Cicer arietinum* L.) seeds soaked for 24 hrs in water containing 3 cc of crude filtrate ('Polyporin,' *1*) showed distinct retardation of germination when compared with the control soaked in water; even the seedlings which ultimately developed were fewer in number and shorter in length than those of the control.

Rings were cut from the outer cortex of branches of guava (*Psidium guyava* L.) trees in the College Garden, and the exposed surfaces were kept smeared with (1) crude Polyporin for 24 and 48 hrs, respectively, being

Fig. 1

finally wrapped over with moist cotton wool. Neighboring branches similarly treated were covered with cotton wool soaked in (2) distilled water and in (3) 4% glucose, pea-decoction, and salts (the blank medium commonly used in our 'Polyporin' experiments). In the case of (1), Polyporin was washed out with distilled water after 24 and 48 hrs, respectively, and the regions were covered with moist cotton wool. All the treated parts of the branches were watered daily with distilled water. In the course of 26 days, 2 young roots protruded from the branch treated with Polyporin for 24 hrs, and 6 roots from the region treated with Polyporin for 48 hrs. The roots were quite strong, healthy, and fresh (Fig. 1). Not a single root-formation was observed in the cases of (2) and (3). The experiments are being repeated with *Mangifera indica* L., *Eugenia Jambos* L. trees, and *Areca oleracea* in our College Garden.

According to Ribeiro (*3*), penicillin was found to inhibit germination of seeds after a 24-hr treatment with the antibiotic. With crude penicillin Smith (*5*) has obtained similar results. None of the crystalline penicillins tested by Smith retarded germination appreciably. From plant tissue-culture experiments Ropp (*4*) held that commercial penicillin causes proliferation of cambial tissue, followed by an abundant production of roots. Highly purified penicillin failed to damage the growing sarcomatous cells in mice experiments carried out by Lewis (*2*), while the yellow penicillin used in proper dosage damaged the growing sarcomatous cells without injuring the normal cells.

These results show that crude Polyporin contains substances which cause partial inhibition of seed germination and, like indole-3-acetic acid and indole-butyric acid, promote root growth.

Addendum: Since writing the above, we have succeeded in obtaining root development from *Eugenia Jambos* stems treated with Polyporin for 48 hrs.

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Preflooding Treatments With DDT for Mosquito Control[1]

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The residual toxicity of DDT has made possible the use of preflooding treatments for the control of mosquito larvae. This method was first used with favorable results by Wisecup and Deonier in 1944 (*3*) on small breeding places of species of *Psorphora* in Florida. Shortly afterward, Wisecup, *et al.* (*2*) found that preflooding treatments with DDT sprays applied by airplane effectively controlled mosquitoes in Arkansas rice fields. In 1946 Horsfall (*1*) employed an adaptation of this method by adding DDT to fertilizer to control *Psorophora confinnis* (L.-Arr.) in rice fields. Wisecup, *et al.* (*4*), however, reported poor control of salt-marsh mosquitoes, *Aëdes taeniorhynchus* (Wied.) and *A. sollicitans* (Walk.), with relatively low dosages of DDT sprays (emulsions and solutions) applied by airplane. Recently Yates and Gjullin

[1] This work was conducted under a transfer of funds from the Office of the Surgeon General, U. S. Army, to the Bureau of Entomology and Plant Quarantine.

(*5*) reported successful results with preflooding treatments applied to breeding areas of *Aëdes* mosquitoes along the Columbia River in Oregon. The present paper contains a brief report of tests made with DDT applied as preflooding treatments in 1946. Laboratory tests compared different formulations, and a field test was made in which a dust was applied with hand dusters against salt-marsh mosquito larvae.

In the laboratory tests, four series of two dishes each, one containing a layer of sand and the other a layer of muck, were treated with DDT at a rate equivalent to 0.2 lb/acre. One series of dishes was treated with a solution of DDT in deodorized kerosene, one with a xylene-Triton X-100[2] emulsion containing 25% of DDT, one with a suspension made with 50% water-dispersible DDT powder, and the fourth with a dust containing 5% of DDT in talc. To obtain uniform distribution of the insecticide, ¼″ of water was placed in the dishes and allowed to evaporate. The dishes were reflooded at the end of the 3rd, 8th, and 12th weeks, in each case after complete evaporation of the water. The water was added carefully to avoid disturbing the soil. Immediately afterward, late third-instar larvae of *Anopheles quadrimaculatus* Say, *Aëdes aegypti* (L.), and *Culex quinquefasciatus* Say (20 of each species) were introduced. The results of these tests are shown in Table 1.

TABLE 1

RESIDUAL TOXICITY OF DIFFERENT DDT FORMULATIONS APPLIED AS PREFLOODING TREATMENTS FOR THE CONTROL OF MOSQUITOES AT A RATE EQUIVALENT TO 0.2 LB OF DDT/ACRE (3 REPLICATIONS)

Species	Kind of soil	% mortality 48 hrs after application of: Oil solution	Emulsion	Suspension	Dust
First flooding, 3rd week after treatment					
A. quadrimaculatus	Muck	100	73	100	100
	Sand	93	47	100	90
Ae. aegypti	Muck	90	60	88	98
	Sand	87	97	100	100
C. quinquefasciatus	Muck	80	35	15	36
	Sand	32	40	97	68
Second flooding, 8th week after treatment					
A. quadrimaculatus	Muck	72	98	100	100
	Sand	100	38	100	100
Ae. aegypti	Muck	87	38	95	88
	Sand	72	10	100	100
C. quinquefasciatus	Muck	17	7	20	32
	Sand	58	0	92	53
Third flooding, 12th week after treatment					
A. quadrimaculatus	Muck	58	32	93	50
	Sand	93	3	95	85
Ae. aegypti	Muck	52	5	22	90
	Sand	72	7	92	100
C. quinquefasciatus	Muck	10	2	8	17
	Sand	50	5	52	53

The mortality decreased with successive floodings in nearly all the dishes, and, except in those treated with the emulsion, the decrease was usually greater on muck soil than on sand. At the end of 12 weeks the highest mortality of *A. quadrimaculatus* (more than 90%) followed treatment with the suspension, whereas the highest kill of *Ae. aegypti* was obtained with the dust. The mortality of *C. quinquefasciatus* was low in all the dishes. The emulsion showed the poorest lasting qualities.

A field test was made with a 10% DDT dust, at 1 lb of DDT/acre, on 20 acres of a salt-marsh island off the east coast of Florida. The remainder of the island was untreated and served as a check area. The application was made on May 13, and the island became flooded by rainfall or high tides on May 21, June 4, July 11, and August 1. The treatment gave complete control of the larvae that hatched after the first three floodings. After the fourth flooding a few larvae were found, but the number was less than 1/dip in the treated area as compared with 500 or more/dip in the untreated area. The larvae that did develop in the treated area were retarded in growth and either died in the pupal stage or became weak adults.

These results indicate that preflooding treatments with DDT dust may be very effective for use against salt-marsh mosquitoes.

[2] An aralkyl polyether alcohol.

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The Presence of an Alcoholic, Ketonic Derivative of Estrone in Human and Rabbit Blood[1]

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The existence of intermediates in the metabolism of the estrogenic steroid hormones other than the three so-called natural estrogens (estradiol, estrone, and estriol) has long been suspected. The poor recoveries of injected material (averaging 20% of the administered dose) in the urine of both human and animal subjects has given this hypothesis much weight. The course of estrogen metabolism has been studied intensively by many methods. Doisy, Thayer, and Van Bruggen (*1*), Pincus and Pearlman (*5*), and Heard (*2*) have reviewed the field thoroughly.

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