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INFLUENCE OF SOME NUTRIENT MEDIA ON THE TOXICITY OF ZERLATE TO HELMINTHOSPORIUM HAWAIIENSE

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The influence of corn meal dextrose agar, corn meal agar, oat meal agar, lima bean agar and sabouraud dextrose agar on the toxicity of zerlate to *Helminthosporium hawaiiense* (Bugnicourt) was determined.

It was observed that while 100% inhibition of *H. hawaiiense* was obtained when 0.033% zerlate was mixed in corn meal dextrose agar and corn meal agar media, little inhibition of the fungus took place at the same zerlate concentration on sabouraud dextrose agar. Oat meal agar and lima bean agar media also exert some influence and decrease the toxicity of zerlate but not as much as sabouraud dextrose agar medium. It may be presumed that there may be some kind of interaction between the medium and the fungicide which either decreases or enhances the toxicity of the test substance. It is, therefore, suggested that the medium factor may always be taken into consideration in testing the toxicity of fungicides.

Introduction

Considerable work has been done on the testing of candidate fungicides and indigenous substances in the Laboratory, however, little information is available as to the part played by nutrient media which are used for testing the efficacy of these substances and candidate fungicides. The results obtained on the toxicity of a certain compound have been attributed mainly to its chemical structure but the possible influence of the constituents of the nutrient medium, which may either enhance or decrease the toxicity of the compounds, is not usually considered simultaneously.

The present investigation, therefore, was started primarily to determine the effect of some nutrient media on the toxicity of zerlate to *Helminthosporium hawaiiense*.

Materials and Methods

Five different media, namely (1) corn meal dextrose agar (2) corn meal agar (3) oat meal agar (4) lima bean agar and (5) sabouraud dextrose agar were used in these studies. These media were dissolved in distilled water and sterilized at 15 lb pressure for 15 minutes. Twenty ml of each medium was poured in petri dishes and triplicates were employed for each medium. Controls (without zerlate) were also run simultaneously. Zerlate in concentrations of 0.033% was used in these studies.

The petri dishes were then inoculated with a 4 mm disc of *Helminthosporium hawaiiense* which were cut from the growing edges of a 4-day old culture. The petri dishes were incubated at 28°C and examined at regular intervals. The diameter of colonies was measured and mean of three readings was recorded. The results presented in Fig. 1 were taken after 96 hr of inoculation.

Results

It may be observed that in all control dishes, *Helminthosporium hawaiiense* grew fairly well, although growth on sabouraud medium was a little less than on other four media. At a zerlate concentration of 0.033% *Helminthosporium hawaiiense* was completely inhibited when grown on corn meal dextrose agar and corn meal agar media. However, the percentage of inhibition was much less in sabouraud's agar medium where at 0.033% of zerlate, *Helminthosporium hawaiiense* produced 2.62 cm of mycelium in 96 hr.

On oat meal and lima bean agar, the inhibitory effect of zerlate was comparatively more pronounced than on sabouraud, as only 0.83 cm and 0.28 cm of mycelium was produced respectively. The results are summarized in Fig. 1.

Discussion

From the above results it appears that the inhibitory quality of a test substance or candidate fungicide is influenced by the medium which is used for growing the fungus and testing the substance. In the present investigation it is observed that while complete control of *Helminthosporium hawaiiense*, is obtained at a zerlate concentration of 0.033% when tested on corn meal dextrose agar and corn meal agar media, little inhibition takes place when sabouraud dextrose agar medium is used. It may be possible that certain substances in sabouraud's medium may be interacting with

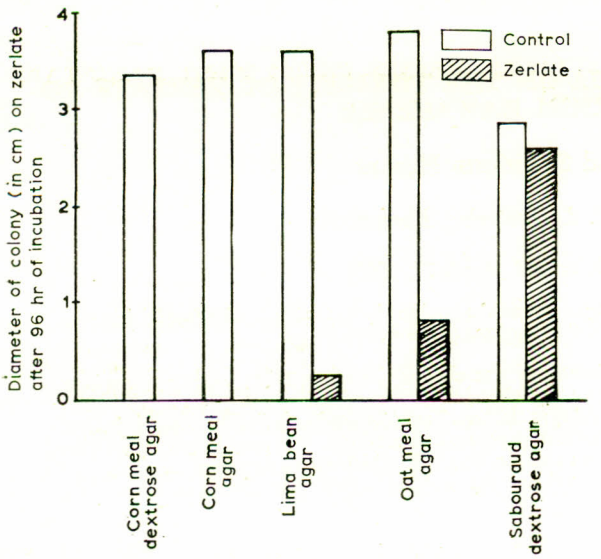

Fig. 1.—Histogram showing the effect of the five mutrient media on the fungitoxicity of zerlate to *Helminthosporium hawaiiense* after 96 hr.

zerlate, thereby decreasing its toxicity. The mechanisms of interaction, of course, is a matter to be investigated.

Somewhat similar influence is exerted by oat meal and lima bean agar with respect to decrease the toxicity of zerlate.

On the contrary it may possibly be true of corn meal dextrose and corn meal agar media where the possible absence of toxicity decreasing constituents brings about a 100% control of *Helminthosporium hawaiiense*. This aspect, of course, needs to be thoroughly investigated before any conclusions are drawn.

It may, however, be suggested that in conducting fungicidal tests in laboratory one may take into consideration the medium factor before drawing any inferences with regard to the fungi toxicity of a particular substance.

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