Int. J. Chem. Sci.: 9(2), 2011, 673-676
ISSN 0972-768X
www.sadgurupublications.com

MICROBIAL RESISTIVITY OF SUBSTITUTED ORGANIC PHOSPHATE (2,4,6-TRICHLORO ANILINE PHOSPHORO MONOAMIDATE-BARIUM SALT)

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ABSTRACT

The study of microbial activity has been done for phosphoromonoamidate against authentic sample of pathogenic bacteria like E. Coli and Bacillus species, fungi like fusarium oxysporum, Rhyzotonia batacicola.

In this investigation, the effect of phosphoromonoamide (2,4,6-trichloro aniline phosphoro monoamidate-barium salt) under study on different fungi was determined by poisoned food technique. The principle involved was to poison the nutrient medium with a fungi toxicant and then allowing a text fungus to grow on such a medium. For Bacterial species streak agar technique was use. In the PDA media required quantity of test compound was added. The inoculums were streaked vertically and horizontally and the growth was determined.

Key words: Microbial resistivity, Phosphoromonoamidate, Fungi.

INTRODUCTION

Organic compounds of phosphorus have an important role in the field of agriculture. These compounds are known to have insecticidal[1] and antiviral[2] activity. They have low stability in biological medium. Among the negative feature is their toxicity to human and animals and rapid appearance of resistant population. They may give rise to acute intoxication due to their direct anticholinesterase effect[3]. The effect of long terms used of organophosphate may result in neuropsychological effect[4] in addition to more commonly accepted effect of cholinesterase inhibiting compound[5]. The kinetic study[6] of this phosphate ester shows that they have some common reaction path which are followed both chemically and biochemically.

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The phosphate drugs attenuate the microorganism and thus help in curing diseases. But the unresponsive of microorganism to various agents like medicines, chemicals has geared the synthesis of new effective compound against of pathogenic organism.

On the above basis microbial observation was made against phosphoromonoamidate in the sample of bacteria and fungi. The microbial activity was determined by poisoned food technique[7] and streak agar technique[8]. Percentage inhibition growth was determined by measuring radial growth of fungus and bacterial colonies with various concentration of test organism.

EXPERIMENTAL

The solution of monoamidate (2,4,6-trichloro aniline phosphoro monoamidate-Barium salt) was prepared in water (acidic medium) because of their insolubility in Dioxane. Different concentration of 5.0×10^{-4} M solution was used during this study.

Fungicidal activity

The antifungal activity was determined using following test organism. PDA media was prepared in the flask and transferred to the petridish. To this media required quantity of the solution of synthesized phosphoromonoamidate was added to get concentration level of 250 ppm, 500 ppm and 1000 ppm. The test compound was thoroughly mixed, sterilized. The inoculums plates were incubated at room temperature and colony diameter has observed at 7 days.

Bacterial activity

The antibacterial activity was studied on bacterial species. The peptone dextrose media was used for the toxological study of bacteria. The media was prepared sterilized. To this required quantity of solution of test compound was added. To each petridish 0.1 mL of standard inoculums of test organism was streaked vertically and horizontally. A control petridish containing only the inoculums of each test organism was also prepared for colonies. The test and control dish were incubated at 28^{o}C for varying period of nearly 3-4 days until growth took place in control plates.

RESULTS AND DISCUSSION

The result are discussed in Table 1 and 2. The fungicidal activity of phosphoromonoamidate shows 80% growth in 500 ppm, while the growth was reduced to 60% in 1000 ppm concentration. Better results were obtained in case of Rhyzotonia

bataticola and fusarium oxysporium where growth was reduced to 75% and 95% respectively.

Table 1: In vitro growth of different fungus with different concentration (250, 500, 1000 ppm) of test compound (2,4,6-trichloro aniline phosphoro mono-amidate-barium salt)

Test organism	Concentration of test compound	Growth %	Sensitivity
Rhizotonia solani	Nill	100%	++
	250	86%	++
	500	80%	++
	1000	60%	++
Rhizotonia bataticola	Nill	100%	++
	250	42%	++
	500	30%	+-
	1000	25%	+-
Fusarium oxysporum	Nill	100%	++
	250	25%	+-
	500	18%	+-
	1000	05%	- -

Table 2: In vitro growth of E. Coli and Bacillus species with different concentration (250, 500, 1000 ppm) of test compound (2,4,6-trichloro aniline phosphoro monoamidate-barium salt)

Growth of E. Coli in mm in various concentration (ppm)				Growth of Bacillus species in mm in various concentration (ppm)		
Concentration (ppm)	250	500	1000	250	500	1000
Growth	3.0	1.0	0.0	4.0	2.0	1.0

For the bactericidal activity E. Coli showed growth of 3 mm in 25 ppm and as the concentration was increased to 1000 ppm no growth was seen. Similar results were obtained in case of Bacillus species.

CONCLUSION

The data obtained from the present investigation revealed that the synthesized organophosphoromonoamidate has antimicrobial activity, but better result are obtained in case of bactericidal activity as the growth was reduced to minimum, where compared to fungicidal activity.

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Accepted : 14.02.2011