S U M M A R Y

Many underdeveloped and developing countries are facing acute food shortages due to population explosion. Therefore, it is ironic that substantial amount of food produced in these countries, are lost due to fungal attack at various stages of production and storage. Plant protection measures are hopelessly inadequate in many of these countries. Plant pathologist have a great role in this direction. The development of new fungicides and its application technique should be a continuing process. An ideal fungicide among other properties should have high fungicidal activity with minimal amount of phytotoxicity. More over it should not create any serious environmental problems. Organotin compounds in recent years are gaining increasing popularity in many countries as effective and suitable fungicides. The pioneering works in the fifties of present century by the I.S.O. group have laid a sound foundation for the commercial use of organotin compounds as effective biocides.

In the current investigation a short resume of the diverse biocidal applications of organotin compounds have been given. These comprise the applications of organotin compounds in the fields of agriculture, wood preservation, anti fouling, molluse control, paint preservation etc.

Though the application of simple organotin compounds are fairly established, very little work has been done so far regarding the biocidal properties of organotin co-ordination compounds. The present investigation is an attempt to find the effect of co-ordination by some ligands with organotin moieties with respect to their biological activity with particular reference to the agricultural applications.

In the first part, some experiments have been carried out to find the effectiveness of a number of triorgano-and diorganotin co-ordination compounds against a number of important plant pathogenic fungi following the mycelial growth inhibition and conidial germination inhibition techniques. It has been observed that triorganotin co-ordination compounds [R_3SnL; where R = phenyl, butyl, propyl and L = dithizone, diphenyl carbazone and oxalyl bis-N-p-tolyl hydroxamic acid] are highly effective against the growth and conidial germination of Piricularia oryzae, Alternaria solani, Verticillium albo-atrum, Helminthosporium oryzae, Aspergillus niger and Penicillium lanosum. The following table of ED_{95} [effective dose for 95% inhibition] values illustrate their high activities.

In the second part, compounds like bis (triphenyltin) oxalyl bis-N-p-tolyl hydroxamate, tributyltin diphenyl carbamate and tributyltin acetate which were proved to be highly effective against the mycelial growth and conidial germination

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Concentrations ($\mu g/ml$) for 50 percent inhibition after final incubation period

Compound	Growth inhibition				Conidial germination inhibition			
	P. oryzae	A. solani	V. albo-atrum	H. oryzae	A. niger	P. jensenii	V. albo-atrum	H. oryzae
Bis(triphenyltin) oxalyl bis-N-p-tolyl hydroxamate	0.44	0.21	1.44	0.15	7.97	2.49	3.44	6.56
Triphenyltin dithizonate	0.54	5.24	6.39	2.78	6.35	2.62	4.20	3.90
Bis(triphenyltin) oxide	-	-	-	-	4.32	<2.50	3.62	5.05
Diphenyltin bis(diphenyl carbazonato)	40.42	223.36	>62.50	100.34	<250.00	>250.00	>250.00	>250.00
Tributyltin diphenyl carbazonate	0.70	4.24	6.23	1.61	3.06	3.55	5.65	7.38

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Compound	Growth inhibition				Conidial germinant on inhibition			
	P.oryzae	A.solani	V.albo-atrum	H.oryzae	A.niger	P.jensseni	V.albo-atrum	H.oryzae
Tributyltin acetate	0.57	1.11	1.72	1.53	2.32	5.36	6.31	4.50
Dibutyltin bis(diphenyl carbasonate)	>62.50	>62.50	>62.50	>62.50	>250.00	>250.00	>250.00	>250.00
Tripropyltin diphenyl carbasonate	6.01	15.96	33.82	31.93	86.68	54.70	107.15	96.85
Di-p-tolyltin bis(diphenyl carbasonate)	70.54	>62.50	>62.50	>62.50	>250.00	>250.00	>250.00	>250.00
Fytolan	492.60	103.43	>62.50	102.00	61.33	130.92	>250.00	>250.00

of H.oryzae, have been used for determining their protectant activity against the soil-borne and seedling infection of H.oryzae on rice. It has been observed that much higher concentration of compounds are required for controlling the soil-borne and seedling infection of rice compared to concentration needed for mycedial growth and conidial germination inhibition of H.oryzae in vitro. It has also been observed that tributyltin acetate, the most active compound for inhibition of conidial germination of H.oryzae in vitro among the test compounds, is less active than bis(triphenyltin) oxalyl bis-3-p-tolyl hydroxamate when applied as a protectant fungicide for controlling the soil-borne and seedling infection on rice, which support the earlier findings that the triphenyltin compounds show better activities than corresponding tributyl tin compounds in actual field trials.

In the third part, bis(triphenyltin) oxalyl bis-3-p-tolyl hydroxamate, tributyltin diphenyl carbamate and tributyltin acetate, proved to be effective for controlling soil-borne and seedling infection of H.oryzae on rice, have been used for determining their phytotoxic effect, if any, on rice. It has been observed that the test compounds are appreciably toxic when applied directly on rice seeds and their toxicity depend upon the concentration and duration of treatment Foliar spraying of the test compounds even at 100 μg/ml concentration

show no toxic effect on rice plants.

In the fourth part, compounds like bis(triphenyltin) oxalyl bis-N-p-tolyl hydroxamate, tributyltin diphenyl carbamate and tributyltin acetate which are highly effective against the conidial germination of store fungi _A.niger_ and _P.jensenii_ of rice, have been used for rice grain preservation in storage. It has been observed that all the test compounds are notably toxic against the store fungi of rice grains initially but their efficiency for controlling fungal population gradually diminish with the increase of storage period which may be due to gradual decomposition of the compounds.

In the last part, experiments were carried out with some selected organotin compounds against _Lentinus praerigidus_ and _Fomes durissimus_ which are the common wood rotting fungi inflicting great economic loss by causing decay of stacked logs of _Shorea robusta_ and _Swietenia mahagoni_ respectively, for determining their wood preservative property following the American agar plate and European wood-block method. Among the test compounds bis (tributyltin) oxide has been found to be most effective for controlling wood rotting fungi. It has also been observed that tributyltin diphenyl carbamate and bis(triphenyltin) oxalyl bis-N-p-tolyl hydroxamate can also check the decaying capacity of the test fungi considerably.