

The present investigation “**Studies on Synthetic, Biological and Agricultural Importance of some new Fluorine based Organic Derivatives of Tin**” was undertaken in past three year with a view to explore the biological and agricultural importance of some fluorine based organotin compounds. The observations made by the earlier workers on antitumor and antimicrobial activity of organotin compounds, it was found that the organic group or moieties attached with metal atom or ion are act as pro-active drugs which make their study really interesting.

The present investigation deals with the synthesis and characterization of some novel as well as known organotin compounds in a view to examine their bio-medicinal efficacy along with their application in control of insects, pest and mites which really damage the Indian agricultural crops basically in north India. In present work author has incorporated fully and partially substituted aromatic groups to study their comparative effect on biological and toxicological studies on insects. It may be noted that among the non-platinum group metals especially those belonging to non-transition p-block elements tin attracting considerable attention towards this area of research.

The present investigation deals the antimicrobial, antitumor and toxicological studies of organotin compounds having different kinds of organic moieties. The variation in organic moieties was performed for the

enhancement of water and lipid solubility of organotin compounds and to study their effect on biomedical and toxicological efficacy. The fluorine containing compounds were generally synthesized for their rich water and lipid solubility.

The organotin compounds, containing aryl and substituted aryl group as organic moieties, were tested for their antibacterial activity against three pathogenic bacterial strains viz. *Pseudomonas aeruginosa*, *Staphylococcus aureus* and *Klebsiella pneumoniae* using disc diffusion method. These compounds show amazing antibacterial activity against these bacteria as shown in their results. The antifungal studies of organotin compounds against two pathogenic fungal strains, *Aspergillus flavus* and *Aspergillus nigar* at concentrations of 50 and 100 µg/ml, of the test compounds was also studied and the results of these compounds show tremendous activity.

Besides this, the work in the thesis also related to the investigation dealing the *in-vitro* antitumor activity of organotin compounds against human breast adenocarcinoma (MCF-7) and mammary cancer cell lines (EVSA-7) by MTT method. The activity results indicate that these compounds are potentially active against the tumor cell lines *in-vitro*. The compounds having substituted aromatic group with nitrogen and carboxylate group as ligands show effective antitumor activity due to their higher water and lipid solubility.

The organotin compounds were also tested for their toxicological studies against the insects, pest and mites especially against *Spodoptera litura* and *Tetranychus urticae* while few organotin compounds were also tested against *Periplaneta americana*. The results were amazing and indicate clearly that these compounds are potentially active and have high efficacy.

Before the biomedical and toxicological screening, the organotin compounds were synthesized by reported methods in good yield and well characterized on the basis of various spectral analysis. In case of organotin carboxylates, IR results suggest that the Sn atom in each of the di- and triorganotin (IV) species approaches six and five-coordination, respectively. So, from these observations it is clear that the organotin compounds in future acts as better supplements in drug industry to control microbial infections, in treatment of simple and acute tumors and also in control of agriculture damage by insects, pest and mites, and therefore would be use for the growth of Indian economy.

LIST OF PUBLICATIONS

1. **Shailendra K. Shukla**, V. K. Tiwari, Sushma Rani, I.C. Tewari, “Studies on Antimicrobial and antitumor efficacy of some new diorganotin(IV) dicarboxylates”, *Inter. Jour. Chem. Resear.*, **3(3)**, 61-65, 2011.
2. **Shailendra K. Shukla**, V. K. Tiwari, Sushma Rani, I.C. Tewari, “Studies on synthetic and biological activity of some new triorganotin(IV) carboxylates”, *Jour. Med. Chem. Lett.*, **1(2)**, 10-19, 2011.
3. **Shailendra K. Shukla**, V. K. Tiwari, Sushma Rani, Ravi Kant, I.C. Tewari, “Studies on synthetic, biological and insecticidal aspects of some diorganotin(IV) diamides”, *Inter. Jour. Agri. Sci.*, **3(3)**, 121-127, 2011.
4. **S.K.Shukla**, V.K.Tiwari, Sushma Rani, Ravi Kant, I.C. Tewari, “Studies on insecticidal and pesticidal activity of some organotin compounds” *Inter. Jour. Agri. Sci.*, **2(1)**, 05-10, 2010.
5. V.K.Tiwari, **Shailendra K. Shukla**, V.S.Chauhan, Ravi Kant, Sushma Rani, I.C. Tewari, “Antimicrobial, antitumor and gastro protective studies of some new water soluble organic derivatives of bismuth”, *Inter. Jour. Pharma. Analy.*, **2(1)**, 09-14, 2010.
6. **S.K.Shukla**, V.K.Tiwari, V.S.Chauhan, S.Rani, R.K.Singh, Ravi Kant, I.C.Tewari, “Antmicrobial and antitumor activity of some new triorganotiin compounds”, *Inter. Jour. Biotech. Resear.*, **2(1)**, 41-45, 2009.
7. V.S.Chauhan, V.K.Tiwari, **S.K.Shukla**, S.Rani, S.N.Mishra, Ravi Kant, I.C.Tewari, “Biological activity of some organic derivatives of bismuth”, *Inter. Jour. Biotech. Resear.*, **2(1)**, 67-71, 2009.