SYNTHESIS AND CHARACTERIZATION OF HETROCYCLIC COMPOUNDS AND THEIR BIOLOGICAL ACTIVITY

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Most medicinal compounds possess one or the other hetrocyclic ring. In the hetrocyclic ring system thiosemicarbazones occupy significant position as they, are a class of compounds possessing a wide spectrum of medicinal properties, and have been studied for their activity against tuberculosis, leprosy, bacterial and viral infections, psoriasis, rheumatism, trypanosomiasis and coccidiosis etc.The synthetic as well as medicinal chemists have endeavored in recent past to synthesize a number of potentially active semicarbazones and thiosemicarbazones containing pyridine, pyrazine, furan and thiophene ring system.Thiosemicarbazones usually react as chelating ligands with transition metal ions by binding through the sulphur and hydrazinic nitrogen atoms. They have been found to be associated with biological activities thus promising a new opportunity to expand the scope of these metal complexes in various fields of medicine. Some scientists studied the carcinostatic activity of a number of thiosemicarbazones containing nitrogen heterocycles and they suggested that these compounds, by loss of a proton from their tautomeric thiolform, act as tridentate chelating agents, sequestering metal ions which are involved in carcinogenesis. Getting an impetus from the foregoing studies and in connection of an on going programme for the synthesis of copper(II) complexes of thiosemicarbazones, it was thought of interest to evolve a synthetic route for preparing similar complexes of thiosemicarbazones derived from 5-nitrofuran-2-carboxaldehyde and thiophene-2-carboxaldehyde with a view of evolving their corresponding Cu(II) complexes.

The present assignment , deals with the synthesis and characteristics of 5-nitrofuran-2-carboxaldehyde thiosemicarbazones and thiophene-2-carboxaldehyde thiosemicarbazones. It also lays emphasis on the biological importance of these compounds as potential antiamoebic . It was followed by synthesis and characterization of Cu(II) complexes of 5-nitrofuran-2-carboxaldehyde thiosemicarbazone and thiophene-2-carboxaldehyde thiosemicarbazone by refluxing a methanolic solution of these ligands and cupric chloride in 2:1 ratio. These square planer complexes were isolated in good yield (65-75%).

During the course of present work ,the biological screening of some representative compounds including thiosemicarbazones and their Cu(II) complexes synthesized

against (HK9) strain of E Histolytica was carried out.

These results indiacate that thiosemicarazones showed moderate activity whereas the introduction of Cu(II) not only enhances the activity of the parental drug but also modifies it from amoebostatic to amoebicidal.