Complexes of Group 12 Metals with 2-Acetylpyridine ^4N-Dimethylthiosemicarbazone and with 2-Acetylpyridine-*N*-oxide ^4N-Dimethylthiosemicarbazone: Synthesis, Structure and Antifungal Activity

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Reaction in ethanol of group 12 metal halides with 2-acetylpyridine ^4N-dimethylthiosemicarbazone (**H4DML**) and with 2-acetylpyridine-*N*-oxide ^4N-dimethylthiosemicarbazone (**H4DMLO**) afforded complexes of the forms $[M(H4DML)X_2]$ (**1 - 9**) and $[M(H4DMLO)X_2]$ (**10 - 18**) (M = Zn^{II}, Cd^{II} or Hg^{II}; X = Cl, Br or I). **H4DMLO** and the complexes of both thiosemicarbazones have been characterized by elemental analysis and by IR and ^{1}H, ^{13}C and ^{113}Cd NMR spectroscopy, and the crystal structures of $[Cd(H4DML)Cl_2]$ (**4**), $[Cd(H4DML)I_2]$ (**6**), **H4DMLO**, $[Hg(H4DMLO)Cl_2]$ (**16**) and $[Hg(H4DMLO)Br_2]$ (**17**) have been determined by X-ray diffractometry. In all the **H4DML** complexes, the thiosemicarbazone acts as an N,N,S-tridentate ligand, and the coordination polyhedra of the pentacoordinate metals are more or less distorted tetragonal pyramids. **H4DMLO** is an O,N,S-tridentate ligand for zinc and cadmium halides and an N,S-bidentate ligand for mercury halides, in which the mercury atom has coordination number four and a distorted trigonal pyramidal environment. In assays of antifungal activity against *Aspergillus niger* and *Paecilomyces variotii*, **H4DML** was more active than nystatin, and its complex with $ZnCl_2$ also showed good activity against *A. niger*; neither **H4DMLO** nor any of its complexes inhibited the growth of either pathogen.