

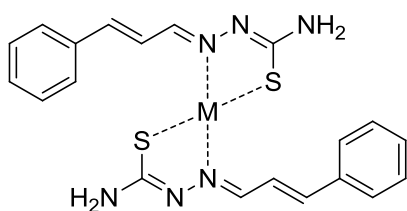
Thiosemicarbazone-based metal complexes as novel anti-mycotoxigenic agents

M. Pioli^a, G. Pelosi^a, F. Bisceglie^a, F. Degola^b, F. M. Restivo^b, S. Montalbano^b, S. Galati^b, and A. Buschini^b

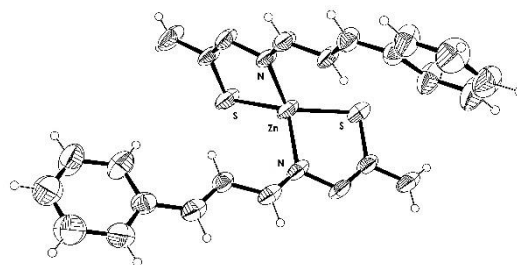
^aDipartimento di Chimica and ^bDipartimento di Bioscienze, Università degli Studi di Parma, Parma, Italy
e-mail: marianna.pioli@studenti.unipr.it

Aflatoxins (AF), extremely carcinogenic mycotoxins, presently constitute a social emergency. In 2009 the European Food Safety Authority has issued a call for proposals launched to study the increase in aflatoxin B1 in cereals as a result of climate change. Three years later, the Italian Ministry of Health issued a statement in which was emphasised the need for continuous controls to prevent risks to human health, due to climate conditions that favoured the growth of mycotoxins. Aflatoxins are produced by fungi, such as *Aspergillus flavus* and *A. parasiticus*, which can grow on a large number of agricultural commodities. The contamination of foodstuff, either pre-harvest or post-harvest, is therefore a serious problem for the agricultural and food industry production chains. In this context, the development of new antifungals, and especially anti-aflatoxigenic agents, assumes great importance.

The aim of the work we are carrying out is to evaluate the potential of a panel of variously functionalized thiosemicarbazones and of their metal complexes as antifungal and anti-mycotoxin agents. In one of our previous publications [1] we found, among a large variety of compounds, that cinnamaldehyde thiosemicarbazone (Htcin) is a promising molecule thanks to its remarkable capacity of inhibition of the AF synthesis and its low cytotoxicity. In the present work, we report a study of how bio-metals, such as zinc and copper, influence the antifungal and anti-toxigenic activity of this compound. In view of a structure-activity relationship study, the molecular components and the fragments that could be produced from the decomposition of the complexes (i.e. cinnamaldehyde, thiosemicarbazide, thiourea and the metal salts) have also been tested. Finally, the cytotoxicity on healthy human cells was checked to assess their safety.



General scheme of the metal complexes



ORTEP plot of the zinc derivative

References

1. Degola, F. *et al.* International Journal of Food Microbiology, **2015**, 200, 104-111.

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