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A PRELIMINARY STUDY ON THE DISTRIBUTION OF KERATINOPHILIC FUNGI IN BOTTOM DEPOSITS OF THE CATALONIAN WATERS

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SUMMARY: Keratinophilic and actidione-resistance fungi were examined preliminarily in bottom deposits of the Catalonian waters, Spain. The relationships between the qualitative and quantitative composition of fungi with the level of water contamination were found.

Keywords: keratinophilic fungi, actidione-resistance fungi, bottom deposits, water contamination.

There has been little information of the occurrence of keratinophilic fungi in marine and fresh water habitats (GARG *et al.*, 1985; ULFIG & ULFIG, 1990). These micro-organisms are widely known as soil-borne fungi. On the basis of available data, it is difficult to determine the actual origin and role of keratinophilic fungi in water systems. It seems possible, however, that these fungi participate in biochemical processes in water, and can be used as specific bioindicators of water contamination. This preliminary report is to recognize the relationships between the level of water contamination with qualitative and quantitative composition of keratinophilic fungi in bottom deposits of the Catalonia Region of Spain.

Bottom deposits were sampled altogether from 17 river and marine locations within November-December, 1990 and February-July, 1991. Three methods were used for evaluation of keratinophilic fungi in bottom samples. These were: 1- hair baiting method (VANBREUSEGERM, 1952); 2- spray technique (KUEHN, ORR & GHOSH, 1961); 3- actidione submerged particle plating method, using the Sabouraud glucose medium with chloramphenicol (100 mg/l) and actidione (2 g/l) (ULFIG, *unpublished data*). For the presence, the latter method has been found to be the most efficacious in isolating of pollution-indicative, keratinophilic and actidione-resistance fungi from bottom samples. Therefore, the results obtained using this method are presented in the communication.

The samples of bottom deposits were found to be moderately enriched in keratinophilic and actidione-resistance species. Out of 396 actidione-treated samples, 201 (50,7%) were positive for these fungi. The river bottom deposits were richer (59,2%) in keratinophilic fungi than those from marine areas (43,4%). Altogether 283 strains of more than 32 species were isolated. The isolates were predominantly *Narasimhella marginospora* (26,1%), *Aphanoascus fulvescens* (16,2%), *Beauveria alba* (8,8%), *N. hyalinospora* (8,4%) and *Myriodontium keratinophilum* (4,9%).

If based on the bacteriological data only the examined waters can be divided into three water pollution classes: **I**, moderately polluted waters (the mean river concentration of faecal coliforms -FC < 10.000/100 mL); **II**, badly polluted waters (FC < 1.000.000/100 mL); **III**, very badly polluted waters (FC > 1.000.000/100 mL). The increasing frequency of *Narasimhella marginospora* together with the increasing faecal water pollution was clearly observed. Concurrantly, the frequency of *N. hyalinospora, B. alba* and *Malbranchea* spp. decreased. *A. fulvescens* appeared to be independent of the level of pollution. Although *N. marginospora* is mainly known to be a colonizer of animal dung and soil (CURRAH, 1985), we have found the fungus as keratinolytic, and our present results indicate its obvious connection with the sewage-contaminated water. Hence, the presence/absence or the predominance of the above species may reflect the degree and source of water contamination. In order to confirm the observations made and to determine further relationships, the study has to be persuaded, and the qualitative and quantitative composition of keratinophilic fungi fully compared with bacteriological, physical and chemical data.

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