

THE LIMPET: *PATELLA CAERULEA* AS BIOMONITORS OF THE HEAVY METAL LEVELS IN TUNISIAN NORTH COASTS, MEDITERRANEAN SEA

Hela Belkhdja^{1*}, Hechmi Missaoui² and Mohamed Salah Romdhane³

¹ Institut Supérieur de Pêche et d'Aquaculture de Bizerte - hela.belkhdja@yahoo.fr

² Direction Générale de la pêche et de l'Aquaculture de Tunis - Tunisie

³ Institut National Agronomique de Tunis, 43 av. Charles Nicolle, 1082, Tunis - Tunisie

Abstract

This work contributed to the study of accumulation of eight metals such as Cu, Cd, Cr, Ni, Mn, Al, Fe and Pb in the Gastropod *Patella caerulea* collected at three stations along the Tunisian North coasts. Result showed that the mean values of the heavy metals in soft tissues were relatively higher at CB station, considered as the worst affected region among the studied areas. The order of metal accumulation in the animal was: Fe >> Al >> Mn - Cu > Ni - Pb > Cr > Cd, where, Mn, Cu, Ni and Pb were changeable in their order at different stations.

Keywords: *Gastropods, Metals*

P. caerulea is selected as a cosmopolite bioindicator for the biomonitoring of metal traces in Mediterranean. Between 30 and 40 specimens were handpicked in the tidal zone from three sites (Bizerta Channel, La Goulette and Sidi Rais). Organisms were depurate and soft tissue was dried, Pulverized and mineralized. Heavy metals analyses were performed in the limpet samples according to the method described by AOAC (2000) [1]. Comparison between stations for the concentration for all metals revealed that The highest mean values of the heavy metals in soft tissues of *Patella caerulea* were found: at CB station, for Cd ($1.50 \mu\text{g g}^{-1}$), Cr ($2.78 \mu\text{g g}^{-1}$) and Fe (2.59mg g^{-1}). We also notice at the same station relatively high mean values for Ni, Al and Pb (3.43 , 402.16 and $3.51 \mu\text{g g}^{-1}$), respectively (Table 1).

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Tab. 1. Mean concentrations of metals in soft tissue of *P. caerulea* collected from the North coasts of Tunisia since summer 2006 until the spring 2007^a mg.g^{-1}

	Metals							
	Fe ^a	Mn	Cu	Cd	Cr	Ni	Al	Pb
CB	2.59	5.14	5.59	1.50	2.78	3.43	402.16	3.51
LG	1.86	10.76	9.29	0.78	0.99	3	351.87	3.61
SR	2.39	9.52	5.87	0.43	2.04	4.14	702.37	2.73

This contamination could be attributed to wastes discharged from Bizerta city and the ships awaiting transit through Bizerta Channel. This zone also receives waste effluents from different industrial unities. Mean iron concentration was much greater than that of the other metals in each station. Similar results reported that Iron is the predominant metal in marine molluscs from the Mediterranean Sea ([2], [3], [4]). Cd concentrations were minimal. The levels found in this work are lower than those registered in limpets from some other parts of the Mediterranean coasts ([5], [6]). Lead levels in *P. caerulea* were in the same order of magnitude in 3 stations. In this present study, Lead concentrations in limpets were higher than those mentioned by [7] in Gulf of Suez and ([5], [8], [6]) in Italy. However, toxic metal concentrations (Cd, Pb) remain lower than the thresholds recommended by the World Health Organisation (WHO). We notice that the order of metal accumulation in the animal at different stations was: Fe >> Al >> Mn - Cu > Ni - Pb > Cr > Cd, where, Mn, Cu, Ni and Pb were changeable in their order at different stations. The observed variation in metal levels in *P. caerulea* at different stations may be related to the environmental conditions of the area and to the physiological conditions of the animal regarding the metal.

References

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