

Cu²⁺ and Zn²⁺ concentrations in the seawater of Marbella Bay, the province of Malaga, Spain in spring

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1. Introduction – In seaports, industrialized or urbanized coastal areas the chronic inputs of heavy metals make it as critical marine environmental pollutants with negative consequences for biota [1-2]. They also influence on the quality of tourist beaches that is important for Marbella and Spain in general. It is known that Cu and Zn concentrations in seawater range broadly in dependence of the site, pollution intensity and the season [3]. The main objective of our work is to determine the levels of dissolved Cu and Zn in the seawater of Ensenada de Marbella in spring.

2. Experimental - The seawater samples were taken at upper layer in 10 m from the coastline in four sites of the Ensenada de Marbella in March-April 2019. These are Puente Romano and Playa De La Vibora that are considered as control, and the ports – Puerto deportivo Marina La Bajadilla and Puerto deportivo de Cabo Pino that are supposed as more polluted sites. The samples were slightly acidized, transported (1 hour) in glass containers to the laboratory and filtered. The metals were determined in three repeatability using the HI-83305-02 multi-parameter photometer, Hanna Instruments Ltd. The method of standard additions was used to eliminate matrix effects from the measurements.

3. Results and Discussion – Our data show the higher Cu concentrations in the water of ports in comparison with Zn and beaches (Table I). The Zn levels have no significant differences.

Table I. Metal concentrations in seawater of the Ensenada de Marbella (µg/L, average ± SD).

	Puente Romano	Playa De La Vibora	Puerto deportivo Marina La Bajadilla	Puerto deportivo de Cabo Pino
Cu	0.31±0.08	0.49±0.16	1.13±0.23	0.84±0.11
Zn	0.51±0.18	0.58±0.19	0.39±0.11	0.29±0.11

For the different areas of Western Mediterranean, the Cu and Zn levels vary up to 60 and 65 times respectively [4-5]. For example, the concentration of dissolved copper in the water of the nearest Malaga Bay fluctuates from 0.07 to 4.2 µg/L [5]. Cu and Zn levels growth in summer under the influence of increased tourist population and the highest navigation. Their lower concentrations are known for March, which are attributed to an amplified flushing of surface waters during rainfall [4].

4. Conclusions - The determined values of Cu and Zn in the Ensenada de Marbella may be considered as low. However, as a seasonal variation for these metals is known [3-4], further research is needed.

5. References

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