

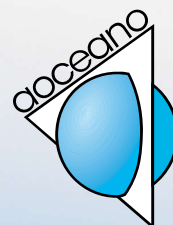
# Resumos do



**Colacmar**

20º CONGRESSO LATINO-AMERICANO DE CIÊNCIAS DO MAR

**cbo** 8º CONGRESSO  
BRASILEIRO DE  
OCEANOGRAFIA

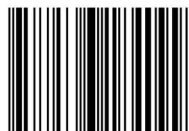


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# ASSOCIAÇÃO BRASILEIRA DE OCEANOGRAFIA

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Oceanografia Química

## 299 - STUDY OF ARSENIC AND ANTIMONY CONCENTRATIONS AND POSSIBLE ENRICHMENTS IN SURFACE SEDIMENTS AT RAMSAR SITE - THE CANANEIA-IGUAPE ESTUARINE-LAGOON COMPLEX CASE

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### INTRODUCCION

As and Sb are widely distributed in the Earth surface environment. There are several processes that can promote mobilization, dispersion and accumulation of these elements as result of natural and anthropogenic pathways. In so many cases estuarine sediments are the destination for compounds originated during the continental weathering and also as result of anthropogenic action. For these reasons, this study aims to understand As and Sb abundance in bottom sediments, the processes and factors that control the concentration of these elements in Cananeia-Iguape Estuary-Lagoon Complex (CIELC), the natural distribution patterns and possible regions subject to deposition of contaminated sediments.

### METHODS

The CIELC covers a large portion of the southern coast of São Paulo state, Brazil, and is contained in a large protected area listed as a Ramsar site. The system comprises four islands surrounded by estuarine and tidal channels. In the northern part of the CIELC the system is supplied with water from the Ribeira River through Valo Grande, which is considered one of the largest environmental disasters in the Brazilian coast [1]. In its southern portion, the drainage basin is constituted of a small hydrographic system, which drains mainly into the internal portion of Trapandé Bay. Tidal effects are more efficient in this sector of CIELC, causing a constant renewal of water. The absence of industry occupation and a low population, with in fishing and tourism as economic activities, contribute to a lower anthropic impact in this sector of the system. The sampling campaign took place in September 2013 and collected bottom sediments at 35 stations

distributed throughout the estuarine system and surrounding areas. Sedimentary particle size, carbonate, organic matter, total As, Sb and Al analyses were carried out. Enrichment factors were calculated relative to upper continental crust (EFUCC) and regional background (EFRB) as defined by [2].

### RESULTS AND DISCUSSION

The As values varied between 0.65 and 10.11 mg Kg<sup>-1</sup>. Highest values occurred at stations P. Tombo, R6 (both with 10.05 mg kg<sup>-1</sup>) and 15 (9.1 mg kg<sup>-1</sup>). Lowest values were observed at stations 17 (0.65 mg kg<sup>-1</sup>) and 18 (0.87 mg kg<sup>-1</sup>). Sb concentrations ranged from 0,071 to 1.467 mg Kg<sup>-1</sup>, showing a distribution trend similar to As, with stations Pedra do Tombo, R6 (1.308 mg kg<sup>-1</sup>), MC2 (0.400 mg kg<sup>-1</sup>) and 15 (0.397 mg kg<sup>-1</sup>) presenting the highest concentrations, and the stations 17 (0.07 mg kg<sup>-1</sup>) and MC3 (0.09 mg kg<sup>-1</sup>) presenting the lowest contents, showing a non-uniform distribution in their levels. This fact was expected given the widely different textural characteristics of the bottom sediments of the CIELC. As and Sb showed positive and high correlation coefficients with the silt + clay fraction (r=0.86). The EFUCC values for arsenic ranged from 1.42 to 9.65, with the lowest value at station 4A and the highest at station MC3. High EFUCC values were also obtained at stations MY4 (9.01), MY2 (8.40), MC1 (7.96) and MY3 (7.66), all in the sea adjacent to the Icapara and Cananéia bars. The FEUCC values for antimony ranged between 1.61 and 7.38. Stations R6 and Pedra do Tombo had the highest values (7.38 and 7.08, respectively), while the lowest value was observed at station 10. High EFUCC values were also observed in samples MC2 (5.02), MY3 (3.83) and MY4 (3.31), in the outer sectors of CIELC. The

EFGB values for arsenic ranged from 0.17 to 1.19 indicates that the high values presented by that element for the EFUCC reflect a natural enrichment of this element in the sediments of the study area. The highest values were presented in the sea stations close to the Icapara bar and the sea adjacent to the Cananéia bar. Sb showed EFGB values between 0.77 and 3.52. Values above 3.00 were observed at R6 (3.52) and Pedra do Tombo (3.38) stations. The average value obtained in the north region of the study area (1.56) was higher than that obtained for the south region (1.20). The comparison of the EFUCC and EFGB values for this element indicates that there is a natural enrichment in relation to the values of the upper continental crust, however a considerable enrichment in relation to the regional background in stations R6 and Pedra do Tombo was observed.

## CONCLUSION

As it is a chalcophile element, antimony is associated with sulfides from the Perau and Rocha mines in the stream sediments of the Ribeira Valley [3]. This author also observed anomalous values in several tributaries of the Ribeira River, which he attributed to sulfides associated with limestones that are exploited in the region, or even to some unknown mineralization. The present study is the first to bring to light that the Sb contamination found in the Ribeira River and some of its tributaries may be contaminating the estuarine sediments at CIELC.

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## SPONSORS

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