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# Development, comparison and validation using ELISAs for the analysis of domoic acid in California sea lion body fluids

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## ABSTRACT

California sea lion (*Zalophus californianus*) mortality attributed to the neurotoxin domoic acid (DA) produced by the diatom *Pseudo-nitzschia* has occurred repeatedly along the United States' (US) west coast since the late 1990s. The purpose of this study was to provide a comparison of DA concentrations for several method platforms in the analysis of sea lion body fluids and to validate a new preparation protocol. The amount, quality, and type of body fluid available for DA analysis from an individual animal are variable and highly dependent on the health of the animal upon arrival at rehabilitation facilities. Additionally, differences in analytical materials, equipment, technical capability, budgets, and objectives of the various groups and/ or agencies involved in this work have influenced current DA quantification platforms. The goal of the present study was to compare the performance of two commercially available enzyme-linked immunosorbent assays (ELISA) for the analysis of DA in a spectrum of California sea lion body fluids, then compare those results with results obtained using liquid chromatography-mass spectrometry (LC-MS) on the same samples. These methods were capable of detecting DA in California sea lion fluids without introducing a significant risk of false positives. The platforms demonstrated relatively good agreement (high $R^2$ values) with known DA concentrations added to sea lion body fluid samples. Also, the linearity observed when platform results were directly compared verified that the magnitude of DA concentrations measured by each platform were comparable. Urine was the exception; all platforms performed poorly in this matrix, likely due to matrix effects, suggesting that sea lion urine should not be used to quantify DA and care should be taken when comparing data from existing datasets.

## Full Text

http://ftp.sccwrp.org/pub/download/DOCUMENTS/AnnualReports/2013AnnualReport/ar13_293_308.pdf