# The geographic and stratigraphic record of Ordovician $\delta^{13}C_{carb}$ in outcrops and the subsurface of Anticosti Island, Canada

DAVID A. FIKE[1], DAVID S. JONES[1,2] AND WOODWARD W. FISCHER[3]

[1]Department of Earth & Planetary Sciences, Washington University, CB 1169, 1 Brookings Dr., St. Louis, MO 63130, USA. (dfike@levee.wustl.edu)
[2]Geology Department, Amherst College, Amherst, MA 01002, USA. (djones@amherst.edu)
[3]Division of Geological and Planetary Sciences, California Institute of Technology, MC 100-23, Pasadena, CA, 91125, USA. (wfischer@caltech.edu)

The Ordovician Period contains both an interval of intense biodiversification as well as one of the largest mass extinctions of the Phanerozoic. The latter, in particular, is associated with an interval of widespread glaciation across the southern supercontinent of Gondwana, together with the global Hirnantian $\delta^{13}C_{carb}$ positive excursion. Here we analyze the mixed carbonate-siliciclastic facies found in outcrops across Anticosti Island, Canada. These data allow us to generate a record of geographic and stratigraphic variability in Late Ordovician $\delta^{13}C_{carb}$ across Anticosti Island during this important interval of Earth history. High-resolution paired $\delta^{13}C_{carb}$ and $\delta^{13}C_{org}$ data both record the +4‰ Hirnantian positive isotope excursion and provide an independent measure of time for stratigraphic correlation [1]. Discontinuities in the isotope record at key lithologic transitions vary as a function of geographic location across the island, providing the foundation for a diachronous model of the deposition of the Hirnantian strata. Moving into the subsurface, we examine the record of Late Ordovician strata preserved in cores and well cuttings from multiple borehole locations across Anticosti island. These data reveal the presence of multiple $\delta^{13}C_{carb}$ excursions throughout the > 1 km of Late Ordovician strata in the subsurface, providing multiple new points for generating stratigraphic correlations across Anticosti Island and between other Late Ordovician locales.

[1] Jones, D. S., Fike, D. A., Finnegan, S., Fischer, W. W., Schrag, D., and McCay, D., 2011. Terminal Ordovician carbon isotope stratigraphy and glacioeustatic sea–level change across Anticosti Island (Québec, Canada). *Geological Society of America Bulletin* **in press**, doi:10.1130/B30323.1.

# Antimony in the environment: The facts – or maybe not

M. FILELLA

Institute F.-A. Forel, University of Geneva, Route de Suisse 10, CH-1290 Versoix, Switzerland (montserrat.filella@unige.ch)

Antimony belongs to group 15 of the periodic table of the elements, along with N, P, As and Bi. It is ubiquitous throughout the environment as a result of natural processes and human activities and it has no known function in living organisms. After a long history of neglect as an element of environmental relevance, Sb attracted increasing public attention in the mid 1990s following a series of claims that it was involved in Sudden Infant Death Syndrome. It has remained a focus of considerable scientific research since that time and a substantial number of papers have now been published on the element and its behaviour in the natural environment.

However, a critical analysis of existing information, its sources, and the methods applied to obtain it [1-8], shows that, aside from a few well-established facts, many key aspects of the environmental chemistry of Sb remain poorly understood. Unfortunately, gaps in knowledge are too often hidden by a strong tendency to blindly reproduce some ‘well-known’ facts and references without looking them up or tracking down additional, more updated information. Well-focussed research, building on thorough knowledge of what is already known, will undoubtedly shorten the path towards a better understanding of Sb behaviour in environmental and biological systems. With this aim, this communication will discuss critical areas identified in [4], with special emphasis on the update of low temperature equilibrium and solubility data [9-11] and the description of antimony interactions with potential natural binders. Implications for the interpretation of existing ecotoxicity data and the prediction of the fate of antimony in water and soils will be critically presented.

[1] Filella *et al*. (2002) *Earth-Sci. Rev*. **57**, 125-176. [2] Filella *et al*. (2002) *Earth-Sci. Rev*. **59**, 265-285. [3] Filella *et al*. (2007) *Earth-Sci. Rev*. **80**, 195-217. [4] Filella *et al*. (2009) *Env. Chem*. **6**, 95-105. [5] Filella (2010) *Met. Ions Life Sci*. **7**, 267-301. [6] Belzile *et al*. (2011) *Crit. Rev. Env. Sci. Technol*. **41**, 1-65. [7] Filella (2011) *Earth-Sci. Rev*. doi: 10.1016/jearscirev.2011.04.002 [8] Filella *et al*. (2011) *Crit. Rev. Env. Sci. Technol*. (in press). [9] Filella *et al*. (2003) *Geochim. Cosmochim. Acta* **67**, 4013-4031. [10] Filella *et al*. (2005) *J. Environ. Monit*. **7**, 1226-1237. [11] Diemar *et al*. (2009) *Pure Appl. Chem*. **81**, 1547-1553.