Organochlorine pesticides in surface waters from Reloncavi Fjord and Chiloe Sea (~39.5ºS - 43ºS): Local or remote sources to southern Chile?

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Organochlorine Pesticides (OCPs, e.g., aldrin, dieldrin, endrin, DDT, endosulfan, heptachlor and HCHs, among others), are toxic and persistent chemical substances that bioaccumulate and biomagnify along the foodwebs in aquatic ecosystems [1]. Significant atmospheric transport and air-water exchange processes of OCPs in the environment, describe latitudinal migration OCPs from warm to cold/remote regions [2], including cold mountain areas, where these compounds can be transported to continental waters [3]. Surface water samples (16 stations) from the continuum: rivers (Petrohue, Cochamo, Puelo river), fjord (Reloncavi), inner-sea (Chiloe island) and continental margin in southern Chile, were extracted and analyzed [4] to estimated levels of dissolved OCPs. α,β,γ,δ-HCH (0.66-69.0 ngL^{-1}), heptachlor (2.0-42.0 ngL^{-1}), heptachlor epoxide (2.0-42.0 ngL^{-1}), α,γ,-chlordane (0.18-50.0 ngL^{-1}), aldrine (9.0-44.0 ngL^{-1}), dieldrin (3.0-35.0 ngL^{-1}), endrin (2.0-30.0 ngL^{-1}), endrin aldehyde (0.44-46.0 ngL^{-1}), endrin ketone (4.0-55.0 ngL^{-1}), *p,p'*-DDT (5.0-19.0 ngL^{-1}), *p,p'*-DDE (6.0-50.0 ngL^{-1}), *p,p'*-DDD (2.0-25.0 ngL^{-1}), methoxychlor (3.0-13.0 ngL^{-1}), α,β-endosulfan (4.0-53.0 ngL^{-1}) and endosulfan sulfate (3.0-29.0 ngL^{-1}) were found in all sampling sites. The highest concentrations of OCPs were found in glacial rivers and close to rivermouth waters, decreasing to the fjord and inner-sea areas. Continental margin stations shown the lowest levels for all OCPs. Our results indicate that rivers are the major source of dissolved OCPs in the study area, suggesting that OCPs are transported via atmosphere from remote areas, deposited on mountain's glaciers and transfered to the rivers, potentially by meltwater and/or surface runoff, and finally released to the ocean.

[1] Jones & de Voogt (1999) *Environ.Pollut* **100**, 209-221. [2] Wania & Mackay (1996) *Environ. Sci. Technol* **30**, 390-396. [3] Blais *et al.* (1998) *Nature* **395**, 685-688. [4] Concha-Graña *et al.* (2013) *Int. J. Environ. Anal. Chem* **93**, 416-433.