Received: 25 January 2020 | Revised: 24 August 2020 | Accepted: 26 August 2020
DOI: 10.1002/rra.3727

RESEARCH ARTICLE

WILEY

Strontium isotopes ($^{87}Sr/^{86}Sr$) reveal the life history of freshwater migratory fishes in the La Plata Basin

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Funding information
Administrative Commission of the River Uruguay (CARU) and Entidad Binacional Yacyretá, Grant/Award Number: 2010-2014; Agencia Nacional de Promoción Científica y TÉcnica, Grant/Award Number: PICT 2015-1823; Consejo Nacional de Investigaciones Científicas y TÉcnicas, Grant/Award Number: PIP112-20120100543CO; Region Île-de-France SESAME Grant, Grant/Award Number: 12015908; Universidad de Buenos Aires, Grant/Award Number: UBACYT 20020150100052BA

Abstract

Strontium isotopes ($^{87}Sr/^{86}Sr$) were evaluated as a potential method for studying the geographical origin of populations and movements patterns of migratory fish from the La Plata Basin (Paraná, Uruguay and Bermejo Rivers and Río de la Plata Estuary, South America). Surface water samples were collected at 43 sites during austral summer and winter (2018) while, Surubí (*Pseudoplatystoma corruscans*), Patí (*Luciopimelodus pati*), dorado (*Salminus brasiliensis*) and sábalo (*Prochilodus lineatus*) fishes were collected at seven locations. Water $^{87}Sr/^{86}Sr$ ratio was analysed by MC-ICP-MS ($N = 74$) and otolith core-to-edge $^{87}Sr/^{86}Sr$ transects ($N = 50$) were measured by LAfs-MC-ICP-MS. Several water bodies presented significantly different ($p < 0.05$) water $^{87}Sr/^{86}Sr$ values. A ~ 1:1 relationship was found between $^{87}Sr/^{86}Sr$ measured in edge otolith and water. Data provide novel perspectives about migratory behaviour for all species, such as potential cross-border migrations between countries of more than 1,000 km recorded for *L. pati*, *S. brasiliensis and P. lineatus*. These species seem to move between the Paraná and Uruguay rivers, which imply using the delta or the

