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Amazonian mammal monitoring using aquatic environmental DNA

Opale Coutant¹, Cécile Richard Hansen², Benoit de Thoisy³, Jean-Baptiste Decotte⁴, Alice Valentini⁵, Tony Dejean⁶, Régis Vigouroux⁷, Jérôme Murienne⁸, and Sébastien Brosse⁹

¹Evolution et Diversité Biologique

²Office Française de la Biodiversité

³Institut Pasteur de la Guyane

⁴VIGILIFE

⁵SPYGEN

⁶Spygen

⁷HYDRECO, Laboratoire Environnement de Petit Saut

⁸CNRS

⁹Laboratoire Évolution & Diversité Biologique (EDB UMR5174)

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Abstract

Environmental DNA (eDNA) metabarcoding has emerged as one of the most efficient method to assess aquatic species presence. While the method could in theory be used to investigate non-aquatic fauna, its development for inventorying semi-aquatic and terrestrial fauna is still at its early stages. Here we aimed at investigating the reliability of aquatic eDNA metabarcoding for inventorying mammals in Neotropical environments, be they aquatic, semi-aquatic or terrestrial. We collected aquatic eDNA in 96 sites distributed along three Guianese watersheds and compared our inventories to expected species distributions and field observations derived from line transect samples. Species occurrences and emblematic mammals' richness patterns were consistent with the expected distribution of the fauna and our results revealed that aquatic eDNA metabarcoding brings additional data to line transect samples for diurnal non-aquatic (terrestrial and arboreal) species. eDNA also provided data on species not detectable in line transect surveys such as semi-aquatic, aquatic and nocturnal terrestrial and arboreal species. While wise application of the eDNA method to inventory mammals still needs some developments to optimize sampling efficiency, it can now be used as a complement to traditional surveys.

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