



Fig. S1. Isotopic Sr profile patterns corresponding to the migration scenarios for *Brachyplatystoma rousseauxii* in the Amazon basin. The weak contrasts of Sr isotopic signatures along the main stem of the Amazon (and WAT), prevents demonstrating migrations in the Amazon mainstem using only $^{87}\text{Sr}/^{86}\text{Sr}$ ratios (right panel), although we know from further analyses using other chemical signatures, that the same long-distance movements and natal homing behavior observed in the Madeira also occur in the Amazon mainstem (see Duponchelle et al. 2016, Hauser 2018 and Hauser et al. 2020 for more details). Note that scenario D was never observed in any of the ~300 fish analyzed in the Amazon basin. Scenarii E and I, could not be observed even if they did exist, owing to the lack of Sr isotopic contrast along the Amazon mainstem.