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# Historical Biogeography of the Western Slimy Salamander (Plethodon albagula)

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# Historical Biogeography of the Western Slimy Salamander (Plethodon albagula)

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The Interior Highlands in Arkansas, Missouri, and Oklahoma are composed of two sections, the Ouachita Mountains and Ozark Plateau, both of which harbor a high diversity of plants and animals. The Ozarks are bordered by the Missouri River to the north and are separated from the Ouachitas to the south by the Arkansas River. Previous work on plethodontid salamanders found that historical dispersals between the Ouachitas and Ozarks have been rare despite their geographic proximity and suggested that the Arkansas River and its floodplain are a barrier to dispersal. The Western Slimy Salamander (Plethodon albagula) was one of the few species that was inferred to have dispersed across the Arkansas River from the Ouachitas to the Ozarks; however, they were unable to distinguish between a single dispersal event or multiple independent dispersals because of limited sampling. To resolve this question, we sequenced the mitochondrial ND2 gene for P. albagula from 176 populations throughout their distribution and constructed a phylogenetic tree. We then used historical biogeographic methods to infer the number of dispersals between the Ouachitas and Ozarks. Additionally, because P. albagula occurs north of the Missouri River in the northern part of its range, we also inferred the number of dispersals across the Missouri River. Our analyses indicated that P. albagula has dispersed across the Arkansas River four times from the Ouachitas to the Ozarks and zero times in the reverse direction. We found evidence for four northward dispersals across the Missouri River. Our study shows that large rivers, which appear to function as strong barriers to other plethodontid salamanders, are more permeable to P. albagula. Better dispersal ability and broader environmental tolerance may explain why P. albagula has come to occupy a large geographic range despite the presence of large rivers whereas other closely related species in the Interior Highlands have not.