

## **SNAKE POPULATION VENOMICS AND ANTIVENOMICS OF BOTHROPS ATROX: PAEDOMORPHISM ALONG ITS TRANSAMAZONIAN DISPERSAL AND IMPLICATIONS OF GEOGRAPHIC VENOM VARIABILITY ON SNAKEBITE MANAGEMENT**

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We describe two geographically differentiated venom phenotypes across the wide distribution range of *B. atrox*, from the Colombian Magdalena Medio Valley through Puerto Ayacucho and El Paují, in the Venezuelan States of Amazonas and Orinoquia, respectively, and São Bento in the Brazilian State of Maranhão. Colombian and Venezuelan venoms show an ontogenetic toxin profile phenotype whereas Brazilian venoms exhibit paedomorphic phenotypes. Venoms from each of the 16 localities sampled contain both population-specific toxins and proteins shared by neighboring *B. atrox* populations. Mapping the molecular similarity between conspecific populations onto a physical map of *B. atrox* range provide clues for tracing dispersal routes that account for the current biogeographic distribution of the species. The proteomic pattern is consistent with a model of southeast and southwest dispersal and allopatric fragmentation northern of the Amazon Basin, and trans-Amazonian expansion through the Andean Corridor and across the Amazon river between Monte Alegre and Santarém. An antivenomic approach applied to assess the efficacy towards *B. atrox* venoms of two antivenoms raised in Costa Rica and Brazil using *Bothrops* venoms different than *B. atrox* in the immunization mixtures showed that both antivenoms immunodepleted very efficiently the major toxins (PIII-SVMPs, serine proteinases, CRISP, LAO) of paedomorphic venoms from Puerto Ayacucho (Venezuelan Amazonia) through São Bento, but had impaired reactivity towards PLA<sub>2</sub> and P-I SVMP molecules abundantly present in ontogenetic venoms. The degree of immunodepletion achieved suggests that each of these antivenoms may be effective against envenomations by paedomorphic, and some ontogenetic, *B. atrox* venoms.