

ISOTOPIC ASSESSMENT OF RESOURCE AND HABITAT USE OF GIANT ARMADILLOS (*PRIODONTES MAXIMUS*) IN THE BRAZILIAN PANTANAL

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RESUMO

The understanding of resource requirements of vulnerable species is key for conservation planning. The association of habitat use, habitat selection, and feeding behavior information could give us an insight into this matter. However, this richness of data is rarely available for studied individuals. In this study, we used movement data and stable isotope analysis to evaluate aspects of the feeding habits of the giant armadillo (*Priodontes maximus*) in the Brazilian Pantanal. We used stable carbon ($\delta^{13}C$) and nitrogen isotopes ($\delta^{15}N$) to assess understand individual resource use, assess differences between sexes and age classes, and their relationship with body mass and habitat use. We collected and analyzed 34 hair samples from 19 giant armadillos (captures and recaptures). Using data from monitored individuals, we determined the proportion of use of each habitat type (forest, closed savanna, open savanna, floodable grassland) by each individual, and assessed their relationship with $\delta^{13}C$ and $\delta^{15}N$ values using linear models. We compared the resource use between sexes and age classes through $\delta^{13}C$ and $\delta^{15}N$ mean values and the size and overlap of their isotopic niches. To account for seasonal changes in resource use, we divided samples into wet and dry seasons according to the capture date, considering captured and recaptured individuals (N=34). Finally, we assessed the relationship between body mass and isotopic values for all individuals, sexes, and age classes using linear models. All samples were corrected using species- specific discrimination factors. We observed a wide variation in resource use by giant armadillos in the Brazilian Pantanal, showing that individuals consume prey from distinct trophic levels ($\delta^{15}N$ values) and occupying different habitat types ($\delta^{13}C$ values). Overall, most giant armadillos presented a mixed diet (C3/C4 resources), i.e., consuming prey that feeds on a mixture of resources from arboreal (forests and closed savannas-C3 resources) and herbaceous vegetation and grasses (open savannas and floodable grasslands-C4 resources), with a few individuals with strictly C4 diets. Males and females did not differ in resource use, showing high similarity in the size and overlap of isotopic niches, but males were slightly more prone to forage on C4 resources. Juvenile giant armadillos presented a diet more restricted to forests and closed savannas, with a smaller isotopic niche than that of adults, which had individuals with more diversified diets, foraging more on open areas. There was a positive relationship between the use of C4 resources and individual body mass, suggesting that larger giant armadillos tend to feed more on open areas.

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We observed slight differences in the isotopic signature of recaptured individuals for both short and large time spans, without any substantial temporal changes in diet. Seasonality also did not influence isotopic values, suggesting that prey availability might be constant throughout the year, i.e., on dry and rainy seasons, or that resource preferences are maintained regardless of prey relative availability. There was a negative relationship between $\delta^{13}\text{C}$ values and the use of habitats with higher arboreal cover, indicating that although giant armadillos are specialist insectivores, there is individual variation in foraging behavior.

PALAVRAS-CHAVE: Diet, Feeding patterns, Food niche, Pantanal, Stable isotopes

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