

BEHAVIORAL AND ADRENOCORTICAL ACTIVITY IN TAMANDUA TETRADACTYLA EXPOSED TO SEMI-CONTROLLED CONDITIONS: SEASONALITY AND RESPONSE TO ANTHROPOGENIC MANAGEMENT DISTURBANCES

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RESUMO

One of the current challenges in conservation biology is to assess and predict the impact of integral species management on stress status of animals, which involves essential activities such as veterinary checks of wild specimens and the transport between facilities and spaces for ex situ conservation. These human activities possess qualities of a stressor stimulus since animals cannot anticipate or control them, and their effect is still unknown in many species. Such is the case of *Tamandua tetradactyla*, a mammal with conservation problems in Córdoba, Argentina. Considering the Reactive Scope model, our general working hypothesis was that intrinsic (e.g. sex) and extrinsic (e.g. photoperiod, temperature and nutrition) factors affect behavioral and adrenocortical responses in *T. tetradactyla* maintained in semi-controlled conditions. The study consisted of four parts: 1) Determination of general activity patterns and their comparison between sexes; 2) Comparison of behavioral and adrenocortical activity between seasons; 3) Assessment of the impact of a veterinary check, consisting of over-night fasting, and blood extraction and body measurements under physical restraint, in winter and summer; and 4) Analysis of the effect caused by terrestrial transport in individual kennels during 3h, in winter and summer, under different feeding management. Adult specimens of both sexes (6 females and 6 males), individually housed, with standardized diet and natural climatic conditions (i.e. photoperiod, temperature and humidity) were studied at Córdoba Zoo (Argentina) during several periods between 2015-2020 (total = 142 days). Their behavior was continuously recorded using infrared cameras and sampled every 5 minutes, and feces were collected daily to measure fecal glucocorticoid metabolites (FGMs) by means of an enzyme immunoassay. Actograms were constructed in order to obtain activity cycles during the day (activity on- and off-set, and acrophase). Results: 1) The animals exhibited a unimodal biphasic activity pattern with variations between sexes (less active and nocturnal females, more active and diurnal males), and individual differences were observed in adrenocortical activity. 2) Animals exhibited seasonality, showing more activity (total, natural, non-natural and nocturnal activity, exploration and social interaction) and a later activity period, as well as higher adrenocortical activity (FGM) in summer than winter. 3) Variations in behavior, but not in FGMs, were observed during and after the veterinary checks (higher total, natural and non-natural activity, exploration and social interaction; less rest;

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alterations in the activity cycle). Finally, 4) transport caused behavioral changes (less exploration and, in summer, reduced natural and nocturnal activity, and social interaction) and alterations in the activity cycle and feeding behavior conditioned by feeding management and seasons. In conclusion, both intrinsic and extrinsic factors considered in the present study affected behavioral and adrenocortical activities in these zoo-housed animals. In general, *T. tetradactyla* individuals seemed to be less affected by these procedures during winter. Additionally, although management disturbances caused changes at the behavioral level, they did not represent a challenge for the maintenance of homeostasis at the adrenocortical level. Our results suggest that the applied management procedures are not major stress challenges for this species.

PALAVRAS-CHAVE: Anteater, Behavior, Cortisol, Season, Stressor.

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