

Kinematic and head morphometric characterization of spermatozoa from the Brown Caiman (*Caiman crocodilus fuscus*)

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Abstract: The development of analytical methods for the evaluation of crocodilian semen is an important component for the assessment of male breeding soundness and the development of assisted breeding technology in this taxon. Computer-Assisted Semen Analysis (CASA) technology is becoming an increasingly common technique in seminal evaluations for animals but there has been no application of this technique for reptilian spermatozoa. The aim of this study was to analyze sperm kinematic and morphometric variables in *Caiman crocodilus fuscus* semen samples and to determine whether there were sperm subpopulations. Four ejaculates from four sexually mature captive caimans were used for this study. ACASA-Mot and CASA-Morph system was used with an image acquisition rate of 50Hz for 2 s of capture. The ISAS®D4C20 counting chambers were used and spermatozoa incubated at 25°C. Total and progressive motilities did not differ among animals ($P > 0.05$). There was a significant animal effect in the model with respect to sperm morphometry, and kinematic indices including linearity (LIN) and straightness (STR) ($P < 0.05$). Results for principal component (PC) analysis indicated variables were grouped into four components: PC₁ related to velocity, PC₂ to progressivity, PC₃ to oscillation and PC₄ to sperm path cross-linking. Subpopulation (SP) structure analysis indicated there were four groups, namely, rapid non-progressive (SP₁), slow non-progressive (SP₂), rapid progressive (SP₃) and medium progressive (SP₄), representing 14.5%, 45.4%, 18.7%, and 21.4% respectively. Findings in the present study indicate the importance of continuing development of reliable protocols regarding the standardization of computer-based semen analyses in reptilian species.

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