References


Dry season diel activity patterns of spectacled caiman (Caiman crocodilus) in the Venezuelan llanos

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A considerable body of work has examined patterns of reptile behavior and activity in association with thermoregulation, including studies on crocodilians (Cott, 1961; Cloudsley-Thompson, 1964; Modha, 1968; Johnson et al., 1976; Smith, 1979). Due to the large size and resulting thermal inertia of most crocodilians (Spotila et al., 1972; Terpin et al., 1979), behavioral patterns of thermoregulation are assumed to be distinctive from those of other reptiles (Lang, 1987). Thermoregulatory strategies may also

differ between temperate and subtropical heat seeking species (e.g., *Alligator mississippiensis*), and more tropical species (Lang, 1987). These differences may be reflected in patterns of land-water movements, with crocodilians under high ambient temperature conditions utilizing heat sinks to keep body temperatures from exceeding preferred levels. However, relatively little quantitative information exists regarding the pattern of land-water movements of wild crocodilians, particularly for tropical species.

The seasonal concentration of large numbers of spectacled caiman, *Caiman crocodilus*, into lagoons in the Venezuelan llanos habitat provides an ideal opportunity to examine diel variation in dry season activity (approximately December to April) and movement patterns. Previous examinations of caiman basking cycle have been conducted by Staton and Dixon (1975), Marcellini (1979) and Ayarzagüena (1983). Some evidence exists indicating that spectacled caiman do avoid high temperatures (Lang 1987), but these observations have not been put into the context of daily activity patterns. The objectives of this study were to quantify diurnal patterns of caiman land-water movement and estimate the proportion of the population engaged in principal activity categories throughout the day.

Diurnal behavior was studied at one lagoon (18 m x 71 m) on Fundo Pecuario Masaguaral, a cattle ranch located in the central Venezuelan llanos (8°33' N, 67°37' W). All observations were made during the annual dry season when reduced water availability concentrated large numbers of animals into a small number of lagoons (Staton and Dixon, 1975). Observations were made during continuous 12 hr periods (06.00-18.00 h) from a vehicle 30 m from the lagoon. The vehicle was parked adjacent to the lagoon approximately one-half hour prior to beginning observations, after an initial period caiman ignored the vehicle and would even haul out and bask next to it. At 15-min intervals all visible caiman were counted and classified in one of three categories: basking (on land), in the water (at the surface), or on the edge (caiman resting in shallow water adjacent to the shore or partially hauled out). The number of caiman underwater was calculated by subtracting the total number of caiman visible from the maximum total count made (usually during the 06.00 h count). Air temperature (Omega 871 hand-held digital thermometer) was recorded hourly. Air and water (5 cm below the surface) temperatures were recorded randomly at a variety of water bodies throughout the ranch as part of a caiman radio-telemetry study (Thorbjarnarson, 1991).

Diurnal observations were made on six days (5 Jan, 16 Feb, 23 Mar, 2 May 1986, 18 Jan 1987, and 18 Dec 1988). The weather was sunny or partly cloudy on all days. Mean ambient temperature increased during the course of the dry season from January (29.3°C) through March (31.4°C), then dropped slightly in May (30.8°C; all temperatures for 1986). Overcast weather was only experienced from 12.00-14.00 h on 18 Jan 1987, and from 06.00-09.15 h on 2 May 1986. A brief drizzle fell at 08.32 h on this latter date. Daily air (Ta) and water (Tw) temperature variation followed a predictable pattern with Ta>Tw in the morning (08.00-12.00 h) and Tw>Ta in the afternoon (fig. 1).

The overall pattern of basking was bimodal, with peaks in the morning (10.00h) and