

The challenge of breeding captive clouded leopards (*Neofelis nebulosa*)

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Pairing the endangered clouded leopard (*Neofelis nebulosa*) for reproduction in captivity is risky due to unpredictable male aggression toward females, which can result in lethal attacks or a need to intervene and separate the pair due to injury or expected injury. To assess potential early indicators for successful pairings (i.e., pairings producing pregnancies), we examined behavioral records and hormonal data from clouded leopards in a breeding program at the Khao Kheow Open Zoo in Thailand. We predicted that aggressive and stereotyped behavior would occur more often during initial introductions in failed than successful pairs, and that affiliative behavior would be more prevalent in successful than failed pairs. We also predicted that individuals in failed pairs would have higher fecal cortisol levels than individuals in successful pairs. Behavioral observations were made of paired males and females 2-5 times weekly during supervised visitations. Daily fecal samples were collected for hormone analysis by enzyme immunoassay. No significant differences were found between animals in successful ($n = 4$) and failed ($n = 4$) pairs in measures of affiliation (grooming, sniffing and rubbing, analyzed separately and combined), aggression (growling/hissing), and stereotypy (pacing). Across all pairs, females tended to display more hissing/growling ($t_7 = 1.86$, $p < 0.1$) and pacing ($t_7 = 1.96$, $p < 0.1$) than males. Females cried more frequently per 30 min in failed than successful pairs (0.18 ± 0.08 versus 0.01 ± 0.01 ; GLM, $p < 0.05$) and also tended to give more prusten vocalizations in failed (1.35 ± 1.15) than successful pairs (0.03 ± 0.02 ; GLM, $p = 0.06$). Males in failed pairs tended to have higher cortisol levels than males in successful pairs (165.5 ± 63.8 versus 80.3 ± 4.6 ; GLM, $p = 0.11$). The results suggest that behavior and hormone levels during initial introductions could be used to predict whether a pair will reproduce successfully.