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Using Markov Chain Analysis to Assess Stereotyped Scent Marking Behaviour in Wild Brown Bears

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Members of the order Carnivora employ a wide range of postures and stereotyped patterns to mark their scent onto objects, and therein communicate with conspecifics. Despite much anecdotal evidence on the marking behaviour of Ursids, empirical data examining marking patterns displayed by wild populations is lacking. Situated on the west coast of British Columbia (2009-2011), we used trail cameras stationed at marking trees to investigate scent marking and investigatory behaviour by wild brown bears *Ursus arctos*. Transitions between postures were assessed using Markov Chain Analysis. Results showed that scent marking patterns varied by age and sex; adult males exhibited a cyclic pattern of marking behaviour which included 'core' and 'secondary' postures, whereas adult females failed to exhibit any subset postures. The behaviour of subadults (sexes combined) was a variation and simplification of the patterns displayed by adult males and females. The wider variety of marking postures selected by adult males may convey a more complex signal, relating to the function of scent marking in the species. Females with young were classified separately to assess potential similarities/differences in the behaviour of all members of the family group. Using a simplified ethogram, we found the behaviour of cubs to be dependent on their age and the behaviour of their mother. Younger cubs were more likely to conduct the same behaviour as their mother, whereas older cubs exhibited behaviours independently. This study presents the first detailed description of the development of scent marking behaviour by cubs in the Ursidae.

Abstract summary

Stereotyped scent marking behaviour was assessed in wild brown bears to examine differences by age sex class and season. Marking behaviour varied by age sex class, with adult males using the widest variety of postures in a cyclic manner. The behaviour of cubs at marking trees was dependent on the behaviour of their mother and their age.

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