

Some Possible Causes of Fatal Attacks on Humans by Large Adult Male Black Bears - A Discussion*

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Abstract

As a result of five human deaths inflicted by two large adult male black bears (*Ursus americanus*) in Algonquin Park, Ontario, a long-term study is being conducted to examine certain aspects of bear anatomy, physiology and behaviour that might lead toward a better understanding of such attacks.

While it is extremely unusual to be attacked by a black bear, most such instances across North America (96.6%, n=29) involve adult males in excess of 120 kg body weight. Evidence at Algonquin Park kill sites indicated that the attacks were predatory in nature. Predation by large adult male black bears on Algonquin Park moose (*Alces alces*) and other bears in excess of 40 kg has been documented. This proves that these bears are capable of preying on and have developed a search image for prey equal to or larger in size than many humans.

Backcountry bears that normally avoid human contact become quite tolerant of human presence at dumpsites that they frequent for food during the non-breeding period. The presence of food at backcountry campsites however, may trigger unpredictable responses toward humans by these same bears.

Joint studies with the Ontario Veterinary College indicate that the black bear is relatively high on the mammalian evolutionary scale and therefore subject to many of the same types of aberrant behaviour as other mammals which result from commonplace brain dysfunctions such as viral infections or tumours. Trauma to specific locations in the brain such as the temporal lobe/amygdala area – which may control violent behaviour – as a result of defensive behaviour by a cow moose, or falling from a mast tree could occur in all segments of a black bear population. However, large adult males would be at greater risk of this type of injury because of their aggressive breeding behaviour – fighting with other males – and predation on other bears. The danger of heavy metal contamination to the brain of large adult males is increased at dumpsites where contaminants may have been discarded, owing to the dominant status and greater retention period – i.e., age – of such bears.

Elevated gonadotropin-releasing hormone (GnRH), luteinizing hormone (LH) and testosterone levels during the breeding season of May-July, or at other times due to pituitary malfunction, could lead to aggressive behaviour toward other species by large adult and especially dominant male bears. Testicular trauma such as cysts could also lead to such behaviour at other times of year. While all considered abnormalities would be expected to occur only sporadically in most bear populations, they would be more likely found in a population such as

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Algonquin Park's where large adult males are not hunted and consequently represent a larger proportion of the population.

Even though experiments have been conducted that indicate no relationship between human menstrual flow and black bear attacks, we feel that there is a need for further research into the matter. Sufficient evidence indicating similarities between the vaginal discharge components of various mammalian and primate species – especially at ovulation when pheromone production and excretion are maximized – exists to warrant further investigation.

The production of musk-like pheromone compounds by the adult males of some mammalian species including humans and the domestic boar (*Sus scrofa*) also suggests that further investigation of black bears in this regard should be given a high priority. There is documentation in the literature that pheromones have cross-species significance as attractant and/or agonistic cues.

Efforts will continue to collect tissue samples from Algonquin black bears, which will be subjected to DNA analysis to establish possible genetic links between individuals, particularly those displaying aggressive behaviour.