
**Deadly intra-specific
aggression in Collared Aracari
*Pteroglossus torquatus***

Aggressive interactions have been reported in many species of Rhamphastidae¹⁻³. These encounters frequently have involved the aggressors holding the victims using their large bills^{1,2}. In all reported instances, however, the aggressive event was interrupted and abruptly ended. Here we report one such encounter that resulted in death. On 26 May 2007 at La Selva Biological Station (10°26'N 84°00'W), La Heredia province, Costa Rica, at 07h42 we were alerted to the presence of a group of Collared Aracari *Pteroglossus torquatus* by their loud vocalisations, which were heard for >4 minutes before we saw the group, suggesting that the interaction had been ongoing for some time. We first observed



Figure 1. A group of Collared Aracari *Pteroglossus torquatus* attack (top, centre) a conspecific, resulting in its death (bottom), La Selva Biological Station, prov. La Heredia, Costa Rica, May 2007 (Jeffrey D. Ritterson)

the group of four individuals in a tree at the edge of a clearing c.6 m above ground. One bird attempted to fly but was obviously injured and flew into the wall of an office building. The rest of the group immediately mobbed the bird; at this point we began recording time. One of the mobbing birds seized the injured individual by the neck with its bill while the others took turns pecking and biting its head, body and feet. The individual holding the bird in its bill vigorously shook the victim at regular intervals. As the attack ensued, several of the individuals retreated to the branch on which they were first observed, occasionally returning to deliver more pecks. After 18 minutes, only the individual restraining the victim by the neck remained. The aggressor continued to hold the victim by the neck for 12 more minutes until the bird expired, and then held the dead individual

for another two minutes before releasing it. The aggressor was visibly exhausted and remained near the victim until it had recovered. Following an additional two minutes the aggressor flew off and eventually joined the other flock members. A total of 34 minutes elapsed between when we began recording and the last aggressor had flown off.

Our observation begs the question: what benefits accrue from killing a conspecific to outweigh costs to the aggressor, including energy expenditure and elevated risk of injury or predation? Aracaris live in small groups of c.4–6 individuals. Group members roost collectively in tree cavities to aid thermoregulation and predator avoidance⁴. Juvenile males disperse from their natal group and attempt to join an unrelated group. This is a dangerous period in a juvenile's life because they are not always welcomed into the new group. If a juvenile is not accepted, it faces higher thermoregulation costs and greater predation risk at night. If these costs are high, the juvenile may continue its attempts to join a group, despite the risk of group rejection and attack. If a juvenile makes repeated attempts to join a group, the group can either accept the juvenile or repeatedly reject it through aggression. Perhaps one extremely aggressive encounter, like that reported here, is more cost effective to the group than many repeated but less aggressive encounters.

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References

1. Brydon, A. (1995) Intra-specific aggression in Pale-mandibled Aracari *Pteroglossus erythropygius*. *Cotinga* 3: 55.
2. Ehrlich, P. R., Bailey, S.-A., Bush, E., Davis, T. & Girshick, S. (2001) Dominance behaviour in toucans. *Cotinga* 16: 64, 66.
3. Short, L. L. & Horne, J. F. M. (2001) *Toucans, barbets and honeyguides*. Oxford: Oxford University Press.
4. Skutch, A. F. (1958) Roosting and nesting of aracari toucans. *Condor* 60: 4.

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