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Cooperative hunting in the Australian Raven with a large fruit bat as the target prey

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Abstract

Avian predation is a major cause of natural mortality in bats. This study presents an observation of a group of Australian Ravens *Corvus coronoides* swooping upon a fully-grown Black Flying-fox *Pteropus alecto* and successfully dislodging it from its perch. The ravens were able to bring the bat to ground level by cooperatively sustaining bombardments to prevent the bat from taking flight after it lost its hold of the foliage. This observation is significant considering that current documentation on predation by Australian Ravens and other corvids mostly pertains to insects, arachnids and molluscs. Reports of corvids feeding on larger prey typically relate to scavenging carrion or targeting weakened individuals. An adult Black Flying-fox, with a body mass of 500–950 g and head-body length of 24–28 cm, is a novel food item, especially in this case where the bat had displayed no visible signs of sickness or external injuries that would suggest it was a weaker target than conspecifics in the same colony.

Introduction

Avian predation is a major cause of natural mortality in bats (Speakman 1991, Lima & O'Keefe 2013, Sieradzki & Mikkola 2020), sometimes suggested as an influencing factor for the scarcity of diurnal activity in bats (Mikula et al. 2016). Some bats, especially the Old-World fruit bats (family Pteropodidae), roost in foliage rather than more enclosed retreat sites such as caves and tree hollows (Pierson & Raine 1992, Kunz & Lumsden 2003). Roosting in foliage exposes them to aerial predators during non-active periods, as demonstrated by reported observations of predation and harassment by raptors at colony sites (Ratcliffe 1932, Vardon et al. 1997, Welbergen 2006). Though, aggregating in colonies hypothetically dilutes the risk of predation for each individual (Groenewoud et al. 2016).

The Corvidae, a cosmopolitan family of passerines, are characteristically generalist omnivores and opportunists (Benmazouz et al. 2021), with species exhibiting varying degrees of predation on other animals (Holyoak 1968). One of the abundant corvids across eastern and southern Australia, the Australian Raven *Corvus coronoides* has an especially broad diet and commonly scavenges (Higgins et al. 2006), facilitating its success in anthropogenic habitats (Moon 2005). Although vertebrate taxa recorded in its diet is mainly from carrion, some active hunting of living vertebrates has been documented (Rowley 1969, Rowley & Vestjens 1973, Lepschi 1994). Though, in respect to feeding on bats, the scientific literature appears to be limited to scavenging on bat carcasses (Sazima 2020).

Observation

Cooperative hunting in Australian Ravens with a fully-grown Black Flying-fox *Pteropus alecto* as the target prey was observed at the Warriewood Wetlands (33.69389°S, 151.29319°E) in Sydney, New South Wales, Australia, on 15 May 2024. The Australian Raven is a commonly observed bird at this location, reflecting its adaptation to suburban areas (Stewart 1997, Moon 2005), especially with a shopping centre adjacent to the wetlands providing ready scavenging opportunities. An area of the wetlands has hosted a seasonal communal roost for fruit bats since November 2012 (Ecosure 2023). The primary species of fruit bat at this site is the Grey-headed Flying-

fox *Pteropus poliocephalus*, which have occurred in numbers of 88–6,500 individuals based on 21 ground counts undertaken as part of the National Flying-fox Monitoring Program (Australian Government 2024). The Black Flying-fox has been recorded at the site on two previous occasions, approximately 40 individuals in February 2018 and 150 individuals in November 2019 (Australian Government 2024). On the day of the predation event, there were approximately 640 Grey-headed Flying-foxes and three Black Flying-foxes in the colony. The Black Flying-foxes were roosting within a single tree slightly segregated from the area occupied by the Grey-headed Flying-foxes.

At approximately 11:00 hours, a pair of Australian Ravens was observed perched in the tree containing the Black Flying-foxes. For approximately 10 minutes, the ravens watched the bats intently from these stationary positions, with the bats showing little response to the ravens' presence. Then, one of the ravens swooped down upon one of the bats followed by the other raven, with both birds repeatedly swooping and pecking the bat one after another. Within seconds, they were joined by three other ravens. The bat tried to take flight but was unable to alight under the bombardments. Within 30 seconds, the bat was brought to ground level where both the bat and ravens were no longer observable behind vegetation. In the following 10 minutes, there was no further activity from either species observed and no indication that the bat had subsequently escaped the pursuing ravens. During the attack, the two other Black Flying-foxes took flight and vacated the tree .

Discussion

Although events following the bat being dislodged were unable to be observed, the observation is significant considering that scientific literature on predation by Australian ravens and other corvids mostly pertains to insects, arachnids and molluscs (Rowley & Vestjens 1973) and reports of corvids feeding on larger prey have typically been via scavenging carrion (O'Brien et al. 2010) or targeting weakened individuals (Rowley 1969). Reports of vertebrates killed by Australian ravens have tended to involve small-bodied animals such as rodents (Hutton 1994), rabbit kittens (Mykytowycz et al. 1959), birds (Lepschi 1994, Rogers & Rogers 1999, Mo 2017) including nestlings (Baxter 1988, Dorfman and Read 1996), and frogs (Vestjens 1977, Rose 1999). An adult Black Flying-fox, with a body mass of 500–950 g and head-body length of 24–28 cm (Markus et al. 2013), is therefore a novel food item. This is especially since the bat had displayed no visible signs of sickness or external injuries that would suggest it was a weaker target than other bats in the colony.

Foraging flocks are well documented in corvids (Ha et al. 2003, Ward & Raim 2011, Boucherie et al. 2022), including the Australian Raven (Hutton 1994, Mitchell & Attwood 2000). In particular, there have been reports of cooperative hunting in Australian Ravens, which correspond with our growing knowledge of advanced socio-cognitive skills in corvids (Nieder 2017, Bugnyar 2024). A notable report involved pairs of Australian Ravens cooperatively harassing egret nestlings, causing them to descend from nest-trees onto the ground where groups of up to eight ravens simultaneously pecked them to death (Baxter 1988). This observation bears similarity with the observation reported in this study. Considering the size of the bat, a lone raven would presumably have had difficulty subduing such a target. Thus, cooperative hunting was likely a key factor in the ravens being able to dislodge the bat from its perch.

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