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SHORT NOTE

"Fright moult" in kereru (*Hemiphaga novaeseelandiae)* during capture results in loss of tail feathers

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Autotomy, the ability of an animal to shed body parts as a means of escape when being attacked, is a unique anti-predator response common in many species such as molluscs, polychetes, arthropods and lizards (Lindstrom & Nilsson 1988). "Fright moult" or "schreckmauser" of feathers from the rump, back and breast in birds may be a similar response for evading capture (Moller *et al.* 2006), since the rump is often the closest part of the body to a pursuing predator, and the loss of a tail does not doom the survival of the individual (Dathe 1955). Alternatively, "fright moult" could be used to confuse a predator in pursuit the same way an octopus uses ink (Lindstrom & Nilsson 1988).

Kereru (or New Zealand pigeon, *Hemiphaga novaeseelandiae)* are large, arboreal fruit-eating pigeons (Family Columbidae) that are widely distributed throughout New Zealand (Robertson *et al.* 2007) and have recently increased in numbers due to reduced predation pressures (Powlesland & Miskelly 2008; Miskelly *et al.* 2008). Kereru display a similar general morphology to other pigeons, with a small head, a straight soft-based bill and loosely attached feathers (Heather & Robertson 2005), and like arboreal fruit doves, are strong flyers with large wings and tails (Goodwin 1983). The plumage of columbiform birds is dense and is easily detached from the thin skin (Gill 2000). This loose feather attachment may make them particularly prone to feather loss in threatening situations and has important implications for kereru capture using mist-nets. This note describes a case of "fright moult" in kereru during mist-netting that resulted in the loss of tail feathers.

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On 28 Mar 2007, a kereru was captured in a mist-net at Otari-Wilton's Bush, Wellington as part of a project investigating the ecology of kereru in urban areas (Awasthy 2007). The bird was an adult of unknown sex, weighing 595 g at capture. An experienced bander (D. Jones) immediately grasped the bird firmly around the body without pulling the tail. The bird was not struggling or entangled in the mist net, but was held in the lower shelf by its own weight. Upon first contact with the bird, an immediate expulsion of feathers occurred from the rump, resulting in the complete loss of all but 1 tail feather and all surrounding contour feathers (Fig 1). Since the bird was in moult, half-grown retrices were also dropped resulting in blood from some follicles (Fig 2). The feathers were collected and weighed (8 g, less than 0.02% of total body weight) and the bird taken into captivity to allow feather re-growth. In captivity, the bird was assessed to be in "good condition" defined by prominent pectoral musculature, an average body weight (see Heather & Robertson 2005), an absence of feather mites and faeces comparable to those of healthy wild conspecifics (*pers. obs*.). Although it is assumed the loss of a tail does not doom an individual, it does nevertheless impede normal flight, as one of the aerodynamic functions of the tail is the control of direction (Thomas 1993). The kereru escaped captivity 3 days after capture but was sighted at the study site on 1 Apr 2007, where it displayed an obvious impediment in flight, swerving without the ability to steer or fly in a straight line. Of the 24 birds captured during this study, this was the only bird to drop its entire tail.

A similar occurrence of complete tail loss was observed during a Department of Conservation

Fig. 1. Feathers of kereru shed during capture in a mist net. Photo by M. Awasthy.

Fig. 2. Rump of kereru with all but 1 sheathed tail feather lost during capture in a mist net. Photo by M. Awasthy.

(DOC) study in Southland (R. Powlesland, *pers. comm*.). Of the 28 kereru mist-netted in total, only 1 dropped all of its tail feathers when entangled in a mist net. The kereru that lost its tail was captured on 29 Mar 2004, and then taken into captivity, where it was recaptured in the aviary on 1 Jul 2004 with an almost fully grown tail. A radio-tag was fitted and the kereru successfully released at the study site. At another site in Taranaki, no kereru were reported to have dropped tail feathers in the 22 kereru mist-netted (R. Powlesland, *pers.comm*.).

Whether the sudden loss of the tail evolved as an anti-predator response in kereru is not clear. Prior to the human introduction of mammalian predators, kereru were sometimes taken as prey by falcons and harriers (Wotton 2007), and the loss of the tail during a chase might enable an individual to escape. However, observations are needed on predatory pursuits between kereru and their aerial predators to determine if the loss of the tail ever occurs in the manner I observed in the netted bird, and if such a sacrifice increases the chances of survival.

Although the occurrence of tail loss appears to be relatively low, it is important for those studying kereru to be aware that mist-netting and handling can result in tail loss. The effects of sudden tail loss can be quite severe, but kereru suffering tail loss can recover in captivity and maintain enough mobility to allow them to feed. The trigger for tail loss is not known, but likely involves both physical contact and increased stress due to handling. Without such information, protocols that minimise both contact and handling time of kereru by researchers may be the best strategy to avoid excessive levels of tail loss.

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