

SHORT NOTE

A rare vocalisation from an adult female tui (*Prosthemadera novaeseelandiae*)

SAMUEL D. HILL

Health Hub Project NZ, Downtown Plaza, Main Street, Palmerston North 4410, New Zealand

Vocal communication between adult birds and nestlings must be conspicuous if it is to maximise effective transmission (Magrath *et al.* 2010). There is often however a trade-off within this communication because calls between parents and young must be unlocatable to eavesdropping predators or rival conspecifics by their subtlety. Yet, they must also be noticeable enough for the nestlings and/or other adult birds to hear and successfully perceive the sound and respond in a behaviourally appropriate way (Anderson *et al.* 2010). Parent calls directed towards nestlings can induce silence (Marques *et al.* 2011), and may also induce other behaviours in nestlings (Anderson *et al.* 2010). A key behavioural response that parent signals can induce in nestlings is the begging posture (Anderson *et al.* 2010; Caro *et al.* 2016; Ryser *et al.* 2016; Searcy & Yasukawa 2017) which chicks adopt when requesting food.

In November 2012, at an active nest site at Wenderholm Regional Park, Auckland, a rare vocalisation was produced by a female tui (*Prosthemadera novaeseelandiae*) (identified by its size compared to her male partner that was also observed) in a possible communication with nestlings. It was not established whether males also produce the vocalisation. Although tui have an extensive range of vocal signals within their repertoire (e.g. Hill *et al.* 2018), this vocalisation has, to my knowledge and despite extensive observation (~300 hours of field observations), not been documented. Although it must be added that the predominant field observations have been of

male tui. The vocalisation was recorded during a nest observation session that lasted approximately 2 hours. They were recorded from approximately 2 metres below the bird using a Sennheiser ME67 long-range directional microphone (Sennheiser, Old Lyme, CT) attached to a Marantz PMD620 digital recorder (Marantz, Kanagawa, Japan). The nest was situated within a manuka tree (*Leptospermum scoparium*) with a large adjacent puriri (*Vitex lucens*).

This vocalisation could potentially be categorised as a solicitation signal as it was produced when the female parent was arriving at the nest with food. The vocalisation consisted of a short note (mean of $0.071 \pm$ (SE) 0.005 sec) with a mean minimum frequency of 0.75 ± 0.006 kHz, and harmonics (up to 4.89 kHz) (Fig. 1). The notes had a mean peak frequency, the frequency at which the maximum power is produced, of 2.07 kHz ± 0.04 sec. According to my observations the vocalisation was produced once on 3 occasions when approximately 1–2 metres from the nest on arrival.

Although further observations are needed for confirmation, this vocalisation may prime the nestlings to adopt a begging posture that will facilitate rapid transfer of food and removal of faecal sacs. However, the rarity of this call may mean that the parents only produce the vocalisation under certain conditions such as when the nestlings are at a particular development stage or even in the presence of a potential predator or even a human observer. Furthermore, there is a possibility that this vocalisation was unique to this individual and indeed may have been an alarm call towards nestlings due to human presence, despite this specific call not being heard at other locations

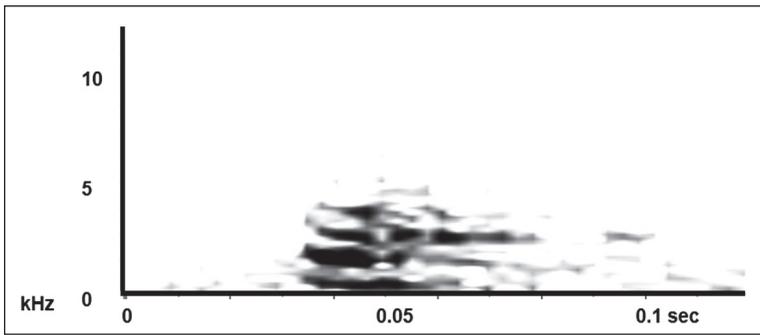


Figure 1. A sound spectrogram of a rare female tui (*Prothemadera novaeseelandiae*) call from Wenderholm Regional Park, Auckland. The sound spectrogram was produced using Raven Pro 1.4 Beta Version software (Cornell Lab of Ornithology, Ithaca, NY, USA).

in human presence. There is also the possibility that this call may have limited broader biological relevance. Nevertheless, these aspects need further clarification.

To elucidate the function of this and other vocalisations within the tui repertoire, playback experiments would be ideal. Furthermore, whether nestlings exhibit sound-based discrimination of parents' solicitation calls (see Charrier *et al.* 2001) or whether these are generic calls across the species such are alarm calls should also be future foci. Using equipment such as fixed cameras (*e.g.* GoPro, San Mateo, California) above nests would help us obtain a full, real-time view of nests. This would be ideal in order to observe and document nestling response to playbacks. Future work could also focus on potential structural changes in tui nestling begging calls in response to different parent calls such as alarm calls. Moreover, documenting visual signals would be useful in ascertaining whether they work in concert with vocal cues to act as honest signals of offspring hunger (reviewed in Mock *et al.* 2011). Furthermore, the advent of automated bird call identification technology (Priyadarshani *et al.* 2018) could be important in detecting rarer calls from multiple species.

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