

First videotaped infanticide in the common pochard *Aythya ferina*

Pavol PROKOP^{1,2}, Róbert TRNKA³ & Alfréd TRNKA¹

¹Department of Biology, University of Trnava, Priemysel'na 14, SK-91843 Trnava, Slovakia; e-mail: pavol.prokop@savba.sk

²Institute of Zoology, Slovak Academy of Sciences, Dúbravská cesta 9, SK-84506 Bratislava, Slovakia

³Nature Protection Institute, Bernolákova 408, SK-02901 Námestovo, Slovakia

Abstract: A growing body of literature suggests that infanticide is common in a variety of animals. However, most reports are concerned with infanticide by males and these evidences are often indirect or questionable. Here we describe the first videotaped non-parental infanticide by a female common pochard (*Aythya ferina*) which killed one conspecific duckling. Our observation does not suggest that this attack was caused by a high density of breeding pairs as was found for other ducks (resource competition hypothesis). We speculate that infanticide in this particular case might be adaptive because a reduced number of ducklings in the pond decreased the vulnerability to predation by raptors.

Key words: infanticide; common pochard

Introduction

Infanticide, killing of conspecific young, has been well documented in a variety of vertebrates (reviewed by van Schaik & Janson 2000) and some invertebrates (e.g., Trumbo 1990; Schneider & Lubin 1996). Although killing of conspecifics could be viewed as a pathological behaviour, there is increasing evidence that infanticide is adaptive to the perpetrator in several contexts. Ebensperger (1998) in his review on infanticide in mammals shows that infanticide may be a mechanism to obtain food (predation hypothesis) or breeding sites (resource competition hypothesis), to avoid adoption of unrelated young (adoption avoidance hypothesis) or to increase the perpetrator's reproductive benefit (sexual selection hypothesis).

Current evidence on infanticide in birds is largely focused on infanticide by males, whereas infanticide induced by female is poorly understood (reviewed by Veiga 2000). Moreover, infanticide by females is observed largely in facultatively polygynous systems of altricial birds where a female kills young or destroys eggs of a rival female to obtain greater paternal investments from a polygynous male (sexual selection hypothesis) (Veiga 1990; Hansson et al. 1997). There are, however, only sporadic reports of infanticide by precocial birds (e.g., ducks and shorebirds: Owen & Black 1990; Fujioka 1992; Shimada et al. 2002). Here, we provide a documented record of infanticide induced by female common pochard *Aythya ferina* (L., 1758) in natural conditions. The killing was videotaped without interruption from the beginning to the end of action. As far as we are aware, this is the first video-documented infanticide among ducks.

Material and methods

The infanticide by a common pochard female was videotaped at a pond near Horná Krupá, SW Slovakia on June 22, 2007. The total area of the pond was 2.5 ha. There were three families of common pochard, i.e., the density was 1.2 families per hectare, which corresponds with data from other localities where breeding density reaches 1–3 bp/ha (Fox & Stawarczyk 1997). The other bird species observed in the pond were mallard *Anas platyrhynchos* (L., 1758), and coot, *Fulica atra* (L., 1758). The victim family consisted of a female with a single duckling. The killer female had six ducklings at the age of 14–21 days.

Results

The infanticidal behaviour was similar to that reported by Shimada et al. (2002) for a female spot-billed duck *Anas poecilorhyncha* (J.R. Forster, 1781). When the killer female was about 4 m from the victim duckling, she quickly approached it while the mother of the victim escaped leaving her young alone (see Electronic supplement). During a 250 second lasting takeover, the killer female hit the victim approximately 200 times (one hit per each 1.25 sec.). Attacks were directed largely on the neck and head. The perpetrator repeatedly caught the neck of the victim, lifted it and shortly shook it. It also submerged the victim and pecked its body. Although the duckling tried to escape for several times, the female perpetrator was chasing persistently. The attacks of the perpetrator continued until the duckling ceased moving. Even a slight movement of the victim provoked the perpetrator into additional attacks. The ducklings of the female perpetrator moved in close proximity of the perpetrator. There are two cases when one

duckling pecked a victim, so ducklings seem to be very interested in what their mother (perpetrator) is doing. The mother of the victim kept at a distance of about 10 m from the perpetrator's family, and did not protect her own young, like females of the gadwall, *Anas strepera* (L., 1758) and the spot-billed duck, *Anas poecilorhyncha* (Shimada et al. 2002).

Discussion

This documented observation suggests that there are similarities between infanticidal takeovers in ducks with respect to types of attacks and behaviour of mothers of victims. Considering that the common pochard raises 5 young on average in this region (Hudec 1994), we speculate that the female perpetrator probably killed more than this single young. We have unfortunately no additional data which would support this hypothesis. Interestingly, the female perpetrator in our observation had older ducklings compared with young of the victimized family which suggests that the female perpetrator started to breed earlier. Early breeding in this case was beneficial, because older ducklings probably better resisted attacks from foreign female duck considering that the risk of infanticide decreases as the age of young increase (e.g., van Schaik & Janson 2000).

The benefit from killing conspecific young in the common pochard can be explained neither by a sexual selection benefit, nor by the predation hypothesis, because males do not provide any paternal care and desert their mates during incubation (Bezzel 1969) and the killed young did not serve as food to the perpetrator. The adoption avoidance hypothesis predicts that infanticide is a strategy to avoid adopting and providing parental care to unrelated offspring. This hypothesis should be also rejected, because the victim was easily distinguishable from perpetrator's own young and the mother of the victim was alive and provided normal parental care to her duckling. The resource competition hypothesis states that infanticide may provide the perpetrator or its offspring with increased access to resources such as food, nesting sites, or space (Ebensperger 1998). In agreement with Shimada et al. (2002) it can be proposed that the latter hypothesis can be applied to the adaptive explanation of the occurrence of infanticide in the common pochard. It is not known, however, whether the space or food were limited factors for the two observed families. Considering that density of common pochard was not high at least in comparison with other reports from the observed area (A. Trnka, unpublished data), the space limit seems not to be the main driver of the infanticide. One alternative explanation, that is not mutually exclusive with the resource competition hypothesis, can be that lower number of ducklings on the pond decreases vulnerability of predation (Gunnarsson et al. 2006). This means that the benefit from infanticide would be a lower rate of attraction of predators like marsh harrier *Circus aeruginosus* (L., 1758), herons, weasels and others.

The observed female attack would also be explained as a non-adaptive behaviour. Perhaps a female showed highly aggressive behaviour when an alien duckling crossed a territorial border of that family. However, this explanation seems unlikely, because reduced number of victimized female suggests that the observed infanticide was not an accident but rather targeted attack by the killer female. In addition, if the non-adaptive explanation is true, the likelihood of infanticidal attacks should be random, i.e. not conducted just by one female killer.

More data from direct observations of female duck competition in various environmental conditions and more knowledge about genetic relatedness of duck families would shed more light on the nature of infanticide among ducks.

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