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Brief report

Chick punishment and chick adoption in Northern Lapwings

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1. Introduction

In Northern Lapwings *Vanellus vanellus* female–female aggression is common in polygynous matings (Liker & Székely 1997, G. B. Grønstøl unpubl.), and leads to discrete female territories within the territories of polygynous males (J. E. Hafsmo unpubl.). Female territories are maintained throughout the chick-rearing period. Trespasses are particularly frequent during the first few days after hatching, as the females often challenge neighbouring territory borders while leading their chicks to good feeding spots. Skirmishes between females then often occur. In this note we report two cases of female aggressiveness not only towards one another but directed toward each other's chicks. In contrast to this, we observed two cases of a female adopting chicks of an other female.

2. Material and methods

The observations were made during studies of lapwing mating behaviour and sex roles at grassland study sites in western Norway (Haukås, Bergen) in 1992, and in southwestern Norway (Gimra, Sola, Rogaland) in 1998 and 1999. The general observation procedures, including recognition of individual birds, followed those of Byrkjedal et al. (1997). Altogether 147 male territories, on which 207 females nested (39.5% polygyny), were held under regular observation. All the chicks involved in the observations here reported had been ringed.

3. Results

3.1. Female aggressiveness toward chicks

— Case 1, Gimra, 13 May 1998. At about 06:00, the primary and secondary females on the territory of a bigamous male were observed from a blind at a distance of 15–20 m. Both females attended broods, and these were feeding about 30 m apart. The primary female had two chicks 15 days of age, while the secondary female had at least three chicks

which were 13 days old. While the primary female got involved in a territorial dispute with a lapwing from a neighbouring territory, one of her chicks gradually encroached onto the territory of the secondary female. Discovering this, the secondary female took flight and swooped down over the chick, which squatted on the ground. The manoeuver was repeated and finally the female alighted beside the chick and started to peck the chick, which received several hard blows to its crown. The female eventually jumped up onto the chick while still pecking. After about half a minute the primary female noticed what kind of trouble one of her chicks had run into, and immediately flew up to and attacked the secondary female. During the ensuing combat between the females, the chick withdrew apparently unharmed to the territory of the primary female. The brood to which this chick belonged was not checked again.

— Case 2, Gimra, 6 May 1999. A female from a monogamous pair was brooding two of a clutch of three chicks at the age of five days. The third chick was very actively feeding and departed quickly from the rest of the brood. About 40 m from its mother, and apparently out of her view, the chick approached the border of the male's territory, immediately beyond which a female belonging to the neighbouring male was sitting on eggs. About 5 m from the nest, the sitting female spotted the chick, got up and ran toward the chick and started to peck at it. The chick squatted, while the female stood behind it pecking. The chick received about 20 blows to the head and the pelvic region. After about one minute, the chick got up and stumbled away closely followed by the female, which was still pecking. After about three minutes, the chick's mother came flying and intercepted the aggressive female by adopting a threat posture on the ground between the aggressor and the chick. This position was held for about half a minute while the chick withdrew into its paternal territory. We subsequently examined the chick, which apart from a few loose down in the pelvic region, did not appear to bear any injuries. The fate of the brood was, however, not further studied.

In none of these cases did the males interfere with or show any interest in what was taking place.

3.2. Adoption of chicks

— Case 1, Haukås, 20 May 1992. A monogamous pair with a brood of two chicks which were six days old walked through a neighbouring territory, apparently in order to occupy a good feeding spot outside their own nesting territory. Passing through the neighbouring territory, the pair leading the two chicks ran into severe conflict with the male which held the territory and his two mates; each female tended a brood of four chicks. In spite of the resistance put up by the territory owners, the pair succeeded in passing through with their chicks. Later that day, as the pair settled on their new site, we checked their brood, which now had an extra chick belonging to the primary female of the territory they had just crossed. The new site was about 200 m from that territory. The adopted chick, which was one day older than its new broodmates, did not return to its parents. It was last checked on 2 June still together with its foster parents and one of their chicks.

— Case 2, Gimra, 1 May 1998. A primary female of a bigamous male adopted no less than two chicks from the secondary female on the same territory. These chicks added to the primary female's own four chicks, and the female could at times be seen brooding all six chicks simultaneously. The two chicks apparently became orphaned before they were adopted, as their mother disappeared permanently from the area on 30 April, the day when they hatched. They were the only chicks hatching from a clutch of three eggs. The desertion as well as the hatching failure were apparently caused by heavy disturbance from farming activities. The chicks of the primary female were two days older than the adopted ones, but repeated checks of the adopted chicks showed that they had the same growth as the primary female's own chicks (J. E. Hafsmo unpubl.). One of the adopted chicks was killed by a tractor 4 May, but the female was still attending five chicks on 9 May. The last check

of these chicks was made on 13 May, and the remaining adopted chick was still alive along with two of the other chicks.

4. Discussion

These observations show that female Northern Lapwings may respond to strange chicks with aggressiveness as well as parental care behaviour, and that this applies to chicks from the same male territory as well as from neighbouring male territories. To our knowledge no such cases have been reported in this species before. Brood adoption is a regular feature in the breeding behaviour of some waterfowl (e.g. Eadie et al. 1988), but with the exception of Bristle-thighed Curlew *Numenius tahitiensis* and American Avocet *Recurvirostra americana* (Lanctot et al. 1995, Lengyel et al. 1998) appears to be less frequent in shorebirds (see Soikkeli 1967, Flemming 1987, and Cooper & Miller 1992 for reported cases). We repeatedly checked 24 lapwing broods in 1998 for chick survival and growth but found no evidence among these broods of chick adoption beyond the single case 2.

In waterfowl, chick adoption may enhance selfish herding (Eadie et al. 1988), in particular if adopted chicks are left to the more predator risk-prone zones more distant from the parent. We do not know if this was the case with the adopted lapwing chicks, but at least in one of the cases the adopted chicks fared as well as the female's own chicks. Safriel (1975), however, showed experimentally that in shorebirds brood enlargements from four to five chicks lead to a decrease in chick survival.

An important parental task of female Northern Lapwings is to lead their broods to good feeding spots, usually restricted to within the female territories. Female territories in this species most likely serve to monopolize food for the chicks (J. E. Hafsmo unpubl.). The observed aggressiveness from females towards strange chicks supports this interpretation. In this context chick adoption seems maladaptive.

We suspect female aggressiveness towards strange chicks to be more common in Northern Lapwings than the present observations may suggest, as an observer has to be fairly close to see what is going on in the relatively tall grass encountered in the chick-rearing period. The two cases observed comprise an overall 3.6% of the 31 and 24 females with chicks studied by us in 1998 and 1999, respectively.

Maladaptiveness of adoptions may be lower if the adopted chicks belonged to relatives. In adoption case 2 the two broods had the same father. Whether the male played any role in initiating this adoption is, however, unknown. Alternatively, Northern Lapwings may not recognize their own chicks well enough to prevent adoption when a situation arises that brings chicks from different broods together under sufficiently confusing circumstances.

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Sammanfattning: **Upptuktelse och adoption av tofsvipeungar**

Det rapporteras här om tofsvipehonors adoption av (två fall) och aggression mot (två fall) vipungar i SV Norge. Aggressionen var en följd av intrång på grannhonors revir, i ett fall tillhörande en sekundärhona tillhörigt ungens far, och i ett annat fall tillhörande ett helt annat par. Inkräktande ungar tilldelades hårda hack innan de kunde räddas av sina mödrar. Adoption konstaterades i ett fall av en hona som övertog en unge från ett intilliggande hanrevir och i ett annat fall där en primärhona övertog två ungar från sekundärhonan till hennes egen make. Aggression mot ungar diskuteras i relation till revirets funktion och adoption i relation till potentiellt släktskap och maladaptation.

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