

Mother-son incest in the barn owl *Tyto alba*

Summary

Two new cases were found in 1999 and 2000 in southern Lower Saxony / Germany by banding activities, one at the second brood of the ♂ (the ♀ was not controlled on the first brood) and the second at the replacement brood of the ♀. From pair 1 genetic finger prints were taken from feathers of both parents and their offspring (5 chicks). No evidence was found against the exclusive parenthood of the two adults caught twice. Indeed the mother-son relationship of the latter can be doubted as the similarity of their genomes is hardly greater than that of not related barn owls.

1. Introduction

Mechanisms to avoid inbreeding or quite incest have been described for many bird species (GREENWOOD & HARVEY 1982, PUSEY & WOLF 1996). In the barn owl this mechanism means that the young generally leave the surroundings of their nursery (SAUTER 1955, 1956, SCHÖNFELD 1974, GLUTZ V. BLOTZHEIM & SCHWARZENBACH 1979, KNEIS 1981, BAIRLEIN 1985). It seems to function so well that proofs of its failure are very rare, although occurrences of this kind directly force publication.

ROULIN (1996) documents three incestuous pairs for *Tyto a. alba*: uncle and niece, twice brother and sister. PETTY et al. (1986) communicate a mother-son pair where the son was her last year child. Somewhat uncertain is the case described by SHAWYER (1998), concerning as well *Tyto a. alba*, of a pair of brother and sister originating from different broods. Certain indeed are the data of ANDERSON et al. (1989) (after SHAW UND DOWELL 1989, cited by SHAWYER 1998) belonging to a brood of mother and son and those of BLACKBURN (after SHAWYER) of a brood of siblings in the nest in which they had grown themselves.

TAYLOR (1994) only knows a pair of brother and sister of different broods (also *Tyto a. alba*). MARTI (1994) names a pair of siblings for *Tyto alba pratincola* which raised two broods only 1,5 km apart from their own place of birth in the year following their birth.

2. Results

2.1 The phonologic data

On 1999-8-28 in the district of Northeim, southern Lower Saxony, Germany, the parent pair of five at least four weeks old nestlings were caught for identification. Both birds had been ringed the year before only 1,1 km apart as mother and son. Both had been controlled twice at the breeding place and no additional bird was present. Egg laying of the common brood of originally 6 eggs had begun with considerable exactness on June 23rd. The ♂ (i.e. the son) had already been controlled on June 13th as feeding ♂ of a first brood only a few hundred metres apart. The ♀ had not been caught. It can be assumed that on June 13th she already passed her time in the box of the future second brood and so escaped control. The young of the first brood had already fledged when the incest of their parents was detected. This pair again breed in 2000 in the same box. But the young disappeared without any trace. Martens as cause are not excluded.

In 2000 one more case, also mother-son has been documented in the study area. With her son of the past year the mother made a replacement brood after her first brood 4,8 km apart had been deserted. In this latter place the brood the son originated from had passed. From the replacement brood six young fledged.

2.2 Genome analysis

To gain further evidence or perhaps certainty for the real parenthood of the birds identified by capture, the satellite DNA was analyzed from feather items.

These feather items were rendered to the Veterinary Institute of the University of Göttingen (Prof. Dr. Dr. B. BRENG). The analyses were made by Dr. I. Pfeiffer as DNA fingerprints after VOS, P. et al. (1995) (AFLP: Amplified Fragment Length Polymorphism). The visualization followed by an automatic Sequenzer (Li-COR 4200). Utilizing the Base Image IR V2.30 (Data Collection DEV7 V2.31, Image Analysis V2.30) and the RFLPscan Plus 3.0 (Scanalytics) similarity coefficients (band-sharing-values) were gained. For all five descendants these values compared to their parents reached at least 0,7, whereas non

relateds have a coefficient of about 0,5. Furthermore in the direct comparison of the band patterns resulted in the detection of a corresponding band in one of the parents for each in the young. So the parenthood of the adult birds controlled at the brood hardly can be doubted.

Surprisingly the similarity coefficient determined for the two parents only reached 0,55. Ringing and identification of the parent birds in 1998 as mother and son has been realized by the author. She has been caught twice with her young. No additional ♀ was detected. Following the analyses, doubts arise, although it is hardly imaginable that the ♀ caught at the brood should not be the mother of the chicks. Any error at the ringing of the ♀ and the young can be excluded. The documentation of the ringing action in the year 1998 is faultless.

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4. Literature

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