

# **Anti-predator behaviour, sexual selection and reproductive success in the House Sparrow**

## ***Passer domesticus***

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### **Summary of the thesis**

Individual components of parental care are disproportionally distributed among the parents in the House Sparrow. While the female broods the nestlings more often and feeds them more frequently, the male defends the nest more intensely. In an experimental study the parents did not adjust their nest defence intensity to behaviour of their partners, nor to brood parameters. Only males tended to defend the sooner broods more intensely, which is in concordance with the „brood value hypothesis“. Male contribution to nestling feeding affected their body mass.

Male nest defence intensity increased with the size of their melanin ornament. Thus, we assume that the ornament could signal male investment in this component of parental care, while it does not correlate with feeding frequency and time spent by incubation. This output is probably caused by pleiotropic effect of genes regulating melanogenesis, affecting e. g. testosterone plasma level, which is associated with increased aggression and lower intensity of other components of parental care as nestling provisioning or incubation.

We have also asked the question whether the anti-predator strategy in House Sparrow is stable or depends on the type of the predator. In experiments with three different predator species we showed, that sparrows adjust their nest defence intensity to the potential threat, which individual predator poses. The most risky reactions were performed in experiments with the Magpie *Pica pica*. The intensity of nest defence further decreased in reaction to the Little Owl *Athene noctua* and was lowest to the Sparrowhawk *Accipiter nisus*. We also stressed the importance of predator's distance from the nest. While placed directly on the nest box the predator induced the nest defence only in the threatened pair. However, placing the predator farther from the colony, representing situation, when all nests were threatened, induced mobbing in all colony members. We assume, that the mobbers were rather a group of selfish parents defending their own progeny, than a social group of altruists putting themselves into risk of predation for the benefit of whole colony. Regarding the adaptive value of mobbing we concluded that it is mainly a part of parental care, because the main beneficiaries of this behaviour are the offspring. Further, mobbing is probably an opportunity for signalling, as males mobbed the predator more intensely than females and with respect to their ornament size. However, if the risk of injury is high, mobbing probably becomes not more suitable

for signalling as was shown in experiments with Sparrowhawk, when all males reacted with the same low intensity as females and irrespective of their ornament size.

Results of faecal analysis showed that nestlings were fed mainly by beetles and dipterans. The nestling condition was affected by the mass of food and its animal component and marginally also by the amount of the beetles in the diet. Thus, we showed the importance of the animal prey for the reproductive success in House Sparrow, which supports the hypothesis, that the shortage of invertebrates in the nestlings' diet contribute to the recent population decline in Europe.