Waldeck, Peter 2007. Brood Parasitism, Sociality and Kinship in the Common Eider
Department of Zoology, Göteborg University, Box 453, 405 30 Göteborg, Sweden

ABSTRACT: Competition over reproduction has in many animals led to the evolution of alternative tactics for gaining reproductive success. A female example is conspecific brood parasitism (CBP), where a parasitic female lays egg in the nest of a female of the same species, which then raises the parasite's offspring together with her own,

This behaviour is particularly common in waterfowl, for reasons that are debated. Waterfowl differ from most birds in that females, not males, tend to breed near their birth site. It has therefore been suggested that relatedness between females could be a contributing factor in CBP. Several recent models have explored the role of relatedness in brood parasitism, reaching different conclusions: some models predict that parasites should avoid relatives, others predict host-parasite relatedness.

One aim of this thesis is to test some of the possible explanations of brood parasitism in common eiders *Somateria mollissima*, with a focus on the role of relatedness. In eiders and other waterfowl, two or more females may also amalgamate their broods of chicks in créches, and raise the brood together. A second aim is to test the role of relatedness in brood amalgamation.

Brood parasitism was studied on two populations, one in the Baltic Sea, and one in Hudson Bay. Parasitism and host-parasite relatedness were estimated using protein fingerprinting of egg albumen. Relatedness of brood amalgamating females in the Baltic Sea was estimates using microsatellites.

Parasitic eggs were found in 20-30% of the nests, 6-8 % of the eggs being parasitic. Compared to many other diving ducks, eiders have smaller clutch size and lower rates of parasitism. This may be an effect of the incubation pattern in eiders, incubation starting after egg 2-3, which in turn may reflect the high risk of nest predation.

Spatial relatedness structure differed between the two populations. In the Baltic Sea there was a clear trend of spatial relatedness decreasing with increasing nests distance, as expected from strong natal philopatry. In the Hudson Bay population we found no such trend.

Pairwise relatedness in host-parasite pairs was higher than for close neighbours. The spatial relatedness trend in the Baltic Sea suggests that the high host-parasite relatedness in part may be explained by natal philopatry. Several aspects indicate, however, that this is not the full explanation. The high host-parasite relatedness in Hudson Bay was clearly not a consequence of natal philopatry alone.

In Hudson Bay nest takeover was common, perhaps as an adaptation to arctic climate with short breeding season, where time saving might be important.

The similar results in these studies of two populations of eiders breeding under different environmental conditions, suggest that relatedness can be an important factor in brood parasitism in eiders. The results refute the hypothesis that parasites avoid relatives, and support the alternative of host-parasite relatedness. Furthermore, high host-parasite relatedness could not be explained by natal philopatry alone; some additional form of kin bias is involved. One candidate mechanism for future study is association between birth nest mates.

In contrast, relatedness seemed not to be important in brood amalgamation. Pairwise relatedness was not higher for females that raised their amalgamated broods together than for random pairs of females. Choice of female partner seems instead to be based on condition of the participating females. There may also be direct benefits for females forming coalitions.

Key words: brood parasitism, brood amalgamation, Somateria mollissima, protein fingerprinting, kin discrimination, relatedness
ISBN 978-91-628-709-9