SOCIAL DOMINANCE, MALE BEHAVIOUR AND MATING IN MIXED-SEX FLOCKS OF RED JUNGLE FOWL

by

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Summary

In mixed-sex flocks of red jungle fowl (\textit{Gallus gallus}), both males and females form dominance hierarchies, and male-male aggression and female choice can influence mating success. If females prefer the dominant male, there is no conflict between intra- and inter-sexual selection. We studied captive flocks consisting of two males and three females. In 1998, dominant males had larger combs than subordinate males in most flocks, while in 1999, comb size did not differ between dominant and subordinate males. The dominant male crowed more and performed more wing flaps than the subordinate male, but both males performed an equal number of tidbits and Waltzes. The dominant male obtained more copulations than the subordinate male. When the dominant male had the larger comb, females of all ranks preferred to mate with and associated with the dominant male. When the subordinate male had the larger comb, primary and secondary females mated with the dominant male while tertiary females mated more often with the subordinate male, and female association with a male did not predict mating. Males with large combs are preferred by females and tend to become dominant, but females seem to prefer males with large combs even when these males are subordinate.

Introduction

Sexual selection can cause the evolution of traits not favoured through natural selection (Darwin, 1871; Andersson, 1994). Males compete for
access to females, and when a male’s ability to compete is enhanced, his reproductive success may increase (Wingfield, 1984). Females are usually the more choosy sex, and female choice can cause the evolution of male ornamental traits (Andersson, 1994). Male ornaments that attract females and a male’s ability to dominate other males tend to be condition dependent and females should choose to mate with males that win in aggressive encounters (Berglund et al., 1996). For example, female pied flycatchers (*Ficedula hypoleuca*) prefer to pair with males that have high quality territories and bright plumage, and bright males hold better territories (Alatalo et al., 1990; Sætre et al., 1994). A male’s ability to dominate other males and female choice both seem important in determining male mating success, and in the pied flycatcher, there seems to be no conflict between inter- and intra-sexual selection. On the other hand, females may prefer to mate with subordinate males when traits selected by male-male competition do not reflect male quality (Qvarnström & Forsgren, 1998). Male cockroaches (*Nauphoeta cinerea*) release pheromones that function in determining social dominance and in female choice (Moore & Moore, 1999). The component of the pheromone that influences female choice differs from the component that confers social status, suggesting that females should at times prefer to mate with subordinate males.

Staged mate choice trials eliminate interactions among males and allow the investigation of female choice. When presented with dead stuffed males, female yellowhammers (*Emberiza citrinella*) prefer to associate with older males that also have brighter feathers (Sundberg, 1995). Female guppies (*Poecilia reticulata*) presented with video images of males prefer to associate with those that have brighter colours and perform more vigorous courtship displays (Kodric-Brown & Nicolletto, 1997). In the Japanese quail (*Coturnix japonica*), female association with a male predicts her mating preference (White & Galef, 1999). In other studies (Zuk et al., 1990b, 1995a; Sætre et al., 1994), nest building or copulations with a male are used to indicate mate choice, but the males are prevented from interacting and females not allowed to assess quality by watching males in aggressive encounters.

In the wild, males interact with each other and females choose mates among the options she has available. When males and females are allowed to interact, social dominance can affect mating and the patterns are more complex than in staged mate choice trials. In mixed-sex groups of guppies, the sexual behaviour of the subordinate male is suppressed and male-male