The Benefits of Cooperative Courtship for Beta Males that help the Alpha

Introduction
Cooperative courtship occurs when beta males engage in behaviors that increase the reproductive success of alpha males. This, so called, ‘wingman-male behavior’ does not occur in many species, likely because alpha males tend to gain most of the reproductive benefits (Duval et. al, 2013). Thus the question is: why do betas participate in courtship displays if they are unlikely to breed and so gain little or no fitness benefits? This review present a series of hypotheses regarding benefits that beta males can gain though cooperative courtship. I will argue that betas are often making the best of a bad situation, wherein males that are unable to attract females by themselves (because they are have low health or quality), adopt this behavioral tactic to garner at least some chance of mating success (in the off chance that they do secure a mating), or that these lower quality males will only be betas when helping a relative, so as to boost their inclusive fitness.

Cooperative Courtship and Altruism: Context
● Altruism is a troublesome concept if one considers individual fitness.
● Group selection would lead to high levels of group extinction
● If a trait is mutually beneficial for both individuals, the trait would be selected for.
● Williams: natural selection can foster the production of individuals willing to sacrifice their lives for their offspring but not for friends. These ideas were developed into kin selection.
● Genetic predisposition to cooperation and altruism is present in many species, possibly even humans. Kin selection will help us understand human behavior. (Johnson et. al., 1986)

Functional debate: What benefits do beta males receive after engaging in cooperative courtship?
1. Kin selection: Males benefit from performing altruistic behaviors for kin.
   ● Krakauer et al. This study suggests that subordinate males can gain indirect benefits from serving alpha male, as explained by indirect fitness.
   ● Implies that males must recognize kin
2. Delayed benefits:
   ● Duval et. al. Study shows that beta males were more likely to become alphas than non-beta males. Paternity tests of offspring showed that beta males had more reproductive success than non-beta males. However, this difference was not replicated in other studies.
   ● Areas close to leks are more rich in foods.
3. Female lek fidelity: Beta males gain benefit of female lek fidelity after a long period of time.
   ● McDonald et. al. Alpha and beta males are not related, benefits of cooperative courtship are received after a long period of time. This
hypothesis suggests that reproductive success is achieved because females choose to mate only with beta males in a certain lek.

Mechanistic rebuttal:
   1. Cooperative courtship leads to greater reproductive success for alpha males and beta males: conflicting findings.
      ● Duval et. al. No difference in reproduction:
      This study compared the reproductive success of alpha males, beta males and non-alpha or beta males. The results showed that coupled courtship was not necessary to successfully reproduce with females.

Is kin selection a valid explanation for Lekking behavior?
   1. Lekking behavior explained by kin selection:
   2. Related males are found together on leks
   3. Indirect-fitness benefits of subordinate males exceed direct benefits of not forming alliances
   4. Kin selection cannot explain lekking
   5. Study looked at allele frequencies at 6-7 polymorphic loci to estimate genetic relatedness of males of four species
   6. Males in leks were not more related
   7. Females do visit leks with more males
   8. Perhaps males join leks to increase the possibility of mating with a female that desired the phenotype of a related males

Alternate hypothesis for lekking behavior:
   1. Hotshot hypothesis: males like to cluster in areas with highly successful males
   2. Hot-spot hypothesis: males cluster in areas of high female density

Social hierarchy of males and formation of alliances: courting characteristics
   ● Courtship behaviors are different when performed in duets.
   ● Cooperative courtship usually occurs in species that have delineated social hierarchies.
   ● Cooperative courtship is possibly related to the amount of territory covered by alpha males.
   ● Duval et. al. described that coupled courtships were different than regular courtships in characteristics like lekking behavior, song vocalizations and pitch.

References


