**Discussion Questions**

to accompany

***Animal Behavior,* Eleventh Edition**

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**Chapter 10**

**Mating Systems**

10.1 Male honey bees (*Apis* *mellifera*) die when they mate for the first and only time, achieving suicidal monogamy when their genitalia are donated to the female. Try to explain the male’s suicidal mating behavior in light of the alternative hypotheses for male monogamy. What predictions follow from the different explanations you have considered? What data are required to resolve the issue?

10.2 In the European starling (*Sturnus vulgaris*), some males acquire several mates but do not assist them, whereas other males are monogamous and work together with their sole partners to rear their broods. Sometimes when there are two females nesting on a male’s territory, the first female to settle pierces her companion’s eggs with her beak (Reid et al. 2002). Why might she do so, and what kind of monogamy could result from her actions? Under what circumstances would the female’s behavior actually qualify as a form of parental investment?

10.3 The mimic poison frog (*Ranitomeya imitator*) of Peru is a truly monogamous animal, as revealed by genetic tests of offspring that are cared for by both parents (Brown et al. 2008). The male fertilizes the eggs of a female after these are laid on a leaf. He then remains by the fertilized eggs until they hatch into tadpoles, after which he carries each tadpole on his back to its own small pool of water in vegetation high in a tree. His partner remains nearby so that when he calls to her, she comes to lay an unfertilized, edible egg in each pool for her tadpole to eat. What kind of mating system is exhibited by this species?

10.4 In a small African antelope called Kirk’s dik-dik (*Madoqua kirkii*), most males and females live in monogamous pairs (Brotherton and Manser 1997). Evaluate alternative hypotheses for monogamy in this species in light of the following evidence: (1) the presence of a male does not affect the survival of the offspring; (2) the male conceals his female’s estrous condition by scent marking over all odors deposited by her in the pair’s territory; (3) the male sires his social partner’s offspring; (4) a female left unaccompanied within a pair’s territory wanders away from it; (5) some territories contain five times the food resources of others; (6) the few polygynous groups that have been observed did not occupy larger, or richer, territories than monogamous pairs of dik-diks.

10.5 In their classic paper on mating systems, Steve Emlen and Lew Oring suggested that two ecological factors could promote the evolution of monogamy: a high degree of synchrony in reproductive cycling within a population, and a highly dispersed distribution of receptive females (Emlen and Oring 1977). Try to reconstruct the logic of these predictions, and then make counterarguments to the effect that synchronized breeding could facilitate acquisition of multiple mates, while a relatively dense population of receptive females might actually promote monogamy.

10.6 Why did Nunn and colleagues look at the relationship between white blood cell counts and the mean sizes of groups in the primate species they studied, and why did they consider the extent to which each species was terrestrial as opposed to arboreal (Nunn et al. 2000)?

10.7 In the polyandrous brown anole (*Anolis sagrei*) lizard, females produce more sons than daughters when paired with males in good condition (i.e., with considerable fat reserves) (Cox et al. 2011). The bias could stem either from paternal effects based on the genes in sperm received from males in good condition, or from maternal “decisions” made after females have mated with these males. If this sex ratio biasing is adaptive for mother lizards, what do you predict about the fitness of sons in relation to the condition of their fathers?

10.8 The gray mouse lemur (*Microcebus murinus*) is a species in which females come into estrus and mate with several males on one night each year. Females accept any and all partners, but a genetic analysis of offspring indicated a greater difference in the MHC genes of mothers and actual fathers than in mothers and males selected at random from the population (Schwensow et al. 2008). Use these results to evaluate the various hypotheses on the indirect genetic benefits of polyandry. What do they suggest about the mechanism that enables a sexually promiscuous female mammal to exercise mate choice?

10.9 In the traditional cultures of the Amazon, many women had extramarital affairs. In these cultures, it was standard practice to accept these affairs. Often the men involved believed that they shared in the biological paternity of the children a woman had during their relationships (Walker et al. 2010). Explain how a belief in multiple paternity may have benefited women in these cultures. Use at least one of your hypotheses to make a prediction about the parental behavior of the additional partners. If this culturally promoted belief reduced male fitness, what should have happened over time in these cultures?

10.10 The average proportion of extra-pair offspring in a brood varies among bird species, from 0.0 to almost 0.8 (Jennions and Petrie 2000). Consider how variation in the benefits and costs of extra-pair paternity might affect the willingness of females to engage in extra-pair copulations. For example, how might low variation in male genetic quality in a species affect the extra-pair paternity figure? What about differences among species in the risk of venereal disease, or in the likelihood that partners will detect and punish the sexual infidelity of a mate? Furthermore, if extra-pair mating primarily provides females with the opportunity to trade up to a genetically or materially superior partner, what is the predicted relationship between extra-pair copulations and “divorce” among songbirds?

10.11 In many animals, females mate repeatedly with the same male, typically their social partner. Perform a cost–benefit analysis of this kind of mating pattern by females, and contrast it with the costs and benefits of polyandrous matings.

10.12 One of the possible benefits to females of participating in lek mating systems is the selection of mates of exceptional genetic quality. This form of sexual selection should tend to reduce genetic variation among males of lekking species over time. Why? If female choice did eliminate genetic variation among males over time, would this outcome support or undercut the argument that females go to leks to choose superior mates, and might the phenomenon of genetic compatibility help us out of this pickle? Is, however, the finding that a very few males monopolize matings at most leks consistent with the suggestion that females visit leks to secure sperm from genetically compatible partners? What would happen if females were to prefer different traits from year to year (Chaine and Lyon 2008)?

References

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