

Biology: Problem 2(b): Investigating Pheromones and their Role in Animal Behaviour

1. In a study of wolf packs, researchers notice a change in the behavior of alpha males during mating season. What role might pheromones play in this behavioral shift?
 - a. Alpha males emit pheromones to attract potential mates.
 - b. Pheromones signal dominance hierarchies among pack members.
 - c. Pheromones regulate the timing of mating behaviors.
 - d. Pheromones deter rival males from approaching mating territories.

2. In the context of beekeeping, how do pheromones influence the social organization within a hive?
 - a. Pheromones emitted by the queen bee attract worker bees for mating.
 - b. Pheromones signal the location of nectar sources to foraging bees.
 - c. Pheromones maintain cohesion among hive members and regulate tasks.
 - d. Pheromones deter predators from approaching the hive entrance.

3. A group of researchers studying ant colonies observes a sudden change in foraging patterns following the introduction of a new queen. What role might pheromones play in this phenomenon?
 - a. Pheromones emitted by the new queen suppress foraging instincts in worker ants.
 - b. Pheromones signal the presence of a new queen and stimulate foraging activity.
 - c. Pheromones from rival colonies disrupt communication within the colony.
 - d. Pheromones regulate the distribution of food resources among colony members.

4. In the study of cat behavior, how do pheromones contribute to marking territories and reducing stress in multi-cat households?
 - a. Pheromones emitted by dominant cats establish territorial boundaries.
 - b. Pheromone diffusers release calming signals to reduce conflict among cats.
 - c. Pheromones emitted during grooming reinforce social bonds between cats.
 - d. Pheromones deter unfamiliar cats from entering established territories.

5. In a research project studying primate social dynamics, scientists observe a change in group cohesion after the introduction of a new member. How might pheromones contribute to this change?
 - a. Pheromones emitted by the new member disrupt existing social hierarchies.
 - b. Pheromones facilitate bonding and acceptance of the new member within the group.
 - c. Pheromones trigger aggressive behaviors among established group members.
 - d. Pheromones signal mating readiness and stimulate reproductive behaviors.

6. In the context of pest management, how do pheromones assist in controlling insect populations without using harmful chemicals?
 - a. Pheromone traps attract insects by mimicking mating signals, reducing breeding success.
 - b. Pheromones repel insects from entering agricultural fields and damaging crops.
 - c. Pheromone sprays disrupt insect communication, causing confusion and disorientation.
 - d. Pheromones attract natural predators of target insect species, reducing population numbers.

Individual Name: _____ Group Name: _____

7. Researchers studying elephant herds notice a change in group dynamics after the birth of a calf. How might pheromones influence this shift in behavior?
 - a. Pheromones emitted by the calf establish social bonds with adult elephants.
 - b. Pheromones signal maternal instincts in female elephants, promoting caretaking behaviors.
 - c. Pheromones deter potential predators from approaching the herd.
 - d. Pheromones emitted by dominant elephants assert control over group movements.
8. In the context of human attraction, how do pheromones contribute to mate selection and social bonding?
 - a. Pheromones emitted by individuals signal genetic compatibility and reproductive fitness.
 - b. Pheromones repel potential mates with undesirable genetic traits.
 - c. Pheromone colognes enhance attractiveness and confidence in social interactions.
 - d. Pheromones mask individual odors to prevent recognition by potential predators.
9. Observations of migratory bird flocks reveal synchronized movements and directional changes during flight. How might pheromones facilitate this coordinated behavior?
 - a. Pheromones emitted by lead birds guide flock movements and navigation.
 - b. Pheromones signal the availability of food sources along migration routes.
 - c. Pheromones suppress aggressive behaviors and maintain flock cohesion.
 - d. Pheromones alert birds to approaching weather changes and flight hazards.
10. In the context of fish breeding, how do pheromones influence reproductive behaviors and spawning synchrony?
 - a. Pheromones emitted by spawning females attract males and stimulate courtship displays.
 - b. Pheromones suppress aggressive behaviors among competing males, allowing for successful mating.
 - c. Pheromone diffusers release signals that induce spawning behaviors in captive fish populations.
11. Researchers studying the behavior of social insects notice a change in nest construction patterns after exposure to environmental disturbances. How might pheromones contribute to this adaptive response?
 - a. Pheromones emitted by disturbed insects signal danger and prompt defensive behaviors.
 - b. Pheromones coordinate collective efforts to repair and reinforce nest structures.
 - c. Pheromones attract additional workers from neighboring colonies to assist in nest maintenance.
 - d. Pheromones deter predators and competitors from approaching vulnerable nest sites.
12. In the context of pet training, how do pheromone-based products assist in modifying behavior and reducing stress in dogs and cats?
 - a. Pheromone sprays deter unwanted behaviors such as marking and scratching on furniture.
 - b. Pheromone diffusers release calming signals to create a sense of security in new environments.
 - c. Pheromone-infused treats reinforce positive behaviors during training sessions.

13. Observations of social primates reveal the formation of grooming clusters within groups. How might pheromones influence this grooming behavior?
- Pheromones emitted during grooming reinforce social bonds and reduce tension within the group.
 - Pheromones mark individuals as part of the social hierarchy, determining grooming partners.
 - Pheromones deter parasites and pathogens, promoting overall health and hygiene.
 - Pheromones signal mating readiness, stimulating courtship behaviors among group members.
14. In the context of agricultural pollination, how do pheromones assist in attracting pollinators to flowering crops and orchards?
- Pheromone traps capture pest insects, reducing damage to crop yields.
 - Pheromone sprays deter invasive species from competing with native pollinators.
 - Pheromones emitted by flowers mimic mating signals, attracting bees and other pollinators.
 - Pheromone diffusers release signals that synchronize flowering times across crop fields.
15. A research team studying colony collapse disorder in honeybee populations notices a decline in hive activity and productivity. How might pheromones be involved in this phenomenon?
- Pheromones emitted by diseased bees attract predators and pathogens to the hive.
 - Pheromones signal stress and alarm, causing bees to abandon the hive.
 - Pheromones regulate the division of labor among worker bees, affecting foraging efforts.
 - Pheromones from neighboring hives disrupt communication and navigation among honeybee colonies.
16. In the context of mammalian reproduction, how do pheromones influence the timing of estrus cycles and mating behaviors?
- Pheromones emitted by females attract potential mates and synchronize reproductive cycles.
 - Pheromone diffusers release signals that induce ovulation in females.
 - Pheromones deter rival males from approaching females in estrus.
 - Pheromones mask the scent of females to prevent unwanted mating attempts.
17. Observations of bird flocks reveal coordinated movements during migration, with individuals flying in V-shaped formations. How might pheromones contribute to this collective behavior?
- Pheromones emitted by lead birds guide flock navigation and flight patterns.
 - Pheromones signal the presence of food sources along migration routes.
 - Pheromones coordinate synchronized wing movements to optimize aerodynamic efficiency.
 - Pheromones deter predatory birds from attacking vulnerable members of the flock.
18. In the context of maternal care in mammals, how do pheromones influence bonding and nurturing behaviors between mothers and offspring?
- Pheromones emitted by newborns stimulate maternal instincts and lactation in mothers.
 - Pheromone diffusers release calming signals to reduce stress and anxiety in new mothers.
 - Pheromones attract potential mates to assist in parental care and provisioning.
 - Pheromones deter predators from approaching nesting sites, ensuring offspring safety.