

The Buzz About Insect Harem Polygyny: Exploring Nature's Intriguing Love Lives

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Abstract

In the enthralling world of insects, love and reproduction take on captivating dimensions. One particularly intriguing aspect is the phenomenon of harem polygyny, where males monopolize multiple females for mating purposes. This article delves into the captivating intricacies of insect love lives, shedding light on the evolutionary drivers and behavioral adaptations behind harem polygyny. From the dazzling displays of dominance to the subtle strategies for securing mates, insects offer a fascinating glimpse into the diverse tactics employed in the pursuit of reproductive success. By exploring the complexities of insect courtship and mate-guarding behaviors, we gain valuable insights into the evolutionary forces shaping mating systems across the animal kingdom. Through vivid examples and engaging narratives, this article invites readers to embark on a journey through the enchanting world of insect romance, where nature's ingenuity knows no bounds.

Keywords: Insects, Harem polygyny, Mating systems, Reproductive behavior

Introduction:

In the vast world of insects, romance takes on unique forms. From elaborate courtship dances to complex mating rituals, insects showcase a diverse array of behaviors. In this bustling realm of the insect world, there exists a fascinating phenomenon known as harem polygyny, where one male mates with multiple females and maintains exclusive access to them. While this might sound like the plot of a soap opera, it's a natural behavior observed in various insect species, offering a captivating glimpse into the complex dynamics of animal relationships.

Picture this: a majestic male insect, adorned with vibrant colors or elaborate ornaments, struts his stuff to attract the attention of several females. Once successful, he establishes his harem, where he reigns supreme as the sole mate of his devoted partners. But why do insects engage in such behavior and what does it entail for their survival?

Mating systems in Animals

1. Monogamous (monogamy):

In monogamous systems, one male and one female are paired for at least one breeding season. In some animals, these associations can last much longer, even a lifetime. Ex: Termites.

2. Polygynous (polygyny):

Polygynous mating refers to one male mating with multiple females. In these situations, the female must be responsible for most of the parental care as the single male is not capable of providing care to that many offspring. The female benefits by mating with a dominant, genetically-fit male; however, it is at the cost of having no male help in caring for the offspring.

Ex: *Xylocopa sonorina*, *Anthidium manicatum*.

3. Polyandrous (polyandry):

In polyandrous mating systems, one female mates with many males. These types of systems are much rarer than monogamous and polygynous mating systems. In pipefishes and seahorses, males receive the eggs from the female, fertilize them, protect them within a pouch, and give birth to the offspring. Therefore, the female can provide eggs to several males without the burden of carrying the fertilized eggs. Ex: honey bee queen.

Harem Polygyny

Harem polygyny is a mating system commonly observed in various insect species, where a dominant male secures exclusive access to a group of females. This phenomenon is prevalent in insects such as ants, bees, wasps and certain species of beetles and flies. The term "harem" refers to a group of females controlled by a single male, mirroring the hierarchical structure seen in human societies (Griffin et al., 2019).

Examples: Animals that form harems include

Mammals	Red deer, Sika deer, Elk, Fallow deer, Collared Peccary, Fur seal, Elephant seal, Greater short-nosed fruit bat, Jamaican fruit bat, African lion	
Primates	Hamadryas baboon, Gelada baboon, Golden snub-nosed monkey, Guinea baboon, gray langurs, Chimpanzee, Gorilla	
Birds	Common pheasant, Greater rhea, Northern harrier, red-winged blackbird	
INSECTS		
Order	Species	Common name

Orthoptera	<i>Hemideina</i> spp.	Tree weta
Orthoptera	<i>Daihinibaenetes giganteus</i>	Giant sand treader camel cricket
Coleoptera	Tribe <i>Ipini</i>	Bark beetles
Hymenoptera	<i>Philanthus bicinctus</i>	Bumblebee wolf
Hymenoptera	<i>Xylocopa virginica</i>	Carpenter bee
Hemiptera	<i>Notobitus meleagris</i>	Bamboo bug
Hemiptera	<i>Acanthocoris sordidus</i>	Winter cherry bug
Hemiptera	<i>Acanthocephala femorata</i>	Leaf-footed bugs
Diptera	<i>Teleopsis dalmanni</i>	Stalk eyed flies
Zoraptera	<i>Zorotypus gurneyi</i>	Angel insects

The Role of Competition

Competition plays a crucial role in determining which males gain control over a harem. In many insect species, males engage in fierce battles or elaborate displays to assert dominance and win access to females. Factors such as size, strength and specialized weaponry often determine the outcome of these competitions, with the victorious males earning the right to mate with multiple females.

Female Choice and Mating Strategies

While male competition is a significant factor in harem polygyny, female choice also influences mating dynamics. In some cases, females actively select mates based on traits such as vigor, health, or genetic compatibility. Additionally, females may employ various strategies to maximize their reproductive success within a harem, including selective mating and mate guarding to prevent rival males from accessing them. Ex. Tree weta (*Hemideina* spp.; Orthoptera: Anostomatidae) and bark beetles (Coleoptera: Scolytidae) (Emlen, 2014).

Benefits and Costs of Harem Polygyny

Harem polygyny offers both benefits and costs for participating individuals. For dominant males, exclusive access to multiple mates increases their reproductive output and ensures the transmission of their genes to future generations. However, maintaining control over a harem requires considerable energy and resources, leaving males vulnerable to predation and other environmental threats. Likewise, females within a harem may experience reduced genetic diversity and increased competition for resources, potentially affecting their overall fitness.

Evolutionary Perspectives



The prevalence of harem polygyny across diverse insect taxa suggests that this mating strategy has evolved in response to specific ecological and social pressures. In some cases, harem polygyny may confer advantages in environments where resources are scarce or competition for mates is intense. Additionally, the genetic benefits associated with mating with dominant males may drive the evolution of this behavior over time.

Ecological Implications

Beyond its evolutionary significance, harem polygyny can have far-reaching ecological implications. By influencing population dynamics and genetic diversity within insect communities, this mating system may shape ecosystem dynamics and resilience. Furthermore, the interactions between harem-forming species and their environments can have cascading effects on other organisms, highlighting the interconnectedness of life on Earth.

Conclusion

In conclusion, insect harem polygyny represents a fascinating aspect of natural history, showcasing the intricate interplay between competition, mate choice and evolutionary adaptation. So, the next time you marvel at a butterfly's graceful flight or a beetle's vibrant colors, remember that beneath their beauty lies a world of fascinating biological drama. As we continue to unravel the mysteries of insect love lives, we gain valuable insights into the diversity and complexity of life on our planet. From tiny ants to majestic butterflies, the world of insects never ceases to amaze with its tales of romance and rivalry.

References

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