JUST AGRICULTURE
multidisciplinary e-Newsletter

Unveiling the Bizarre World of Matriphagy: Mother-Eaters Among Invertebrates

Nagaraju M C[1*], Balaji B N[1] and Shudeer[1]
[1]Department of Entomology, UAS, GKVK, Bengaluru-560065

ARTICLE ID: 57

Abstract

In nature, parental care for offspring is widespread, yet the notion of sacrificing one's life for them is rare. However, there exists a unique phenomenon known as "matriphagy," where a mother sacrifices herself for her young. Matriphagy, observed in certain species of insects, spiders, nematodes, pseudoscorpions, and even caecilian vertebrates, involves the offspring consuming their mother at the end of the caregiving period. Though seemingly extreme, this behaviour can be viewed as altruistic, as it enhances the offspring's chances of survival and success. Interestingly, the progeny that engage in matriphagy tend to fare better than those that do not, and even subsequent generations benefit from this maternal sacrifice. Consequently, the evolutionary development of matriphagy can be attributed to the enhanced fitness it confers upon the mother and her offspring.

Keywords: Matriphagy, Earwigs, Spiders.

Introduction

The natural world never ceases to amaze us with its peculiar and often baffling phenomena, one such intriguing behaviour found in the animal kingdom is matriphagy. While the term might sound complex, it simply refers to the act of consuming one's mother. But what's even more intriguing is the occurrence of matriphagy in the realm of invertebrates. Welcome to the bizarre world of matricide in invertebrates, where nature takes on unexpected twists and turns (Kim, *et al.*, 2000).

Mothers eating their young is pretty common, and the most common victims of cannibalism are eggs and new-borns. But kids can be cannibals too. Matriphagy, or mother-eating, is found in some species of insects, scorpions, nematode worms and spiders. One remarkable case of self-sacrifice taken to the limits occurs in crab spiders. The mothers provide their spiderlings with unfertilized “nurse” eggs to eat. The young eat the eggs and also, slowly, their mother. Over weeks, she is eaten away until she falls immobile and is consumed entirely.

JUST AGRICULTURE
multidisciplinary e-Newsletter

At least it's not for nothing: Spiderlings generally do quite well in cases of matriphagy, with higher weights and survival rates than young that don't eat mom. But why would any creature engage in such an unusual behaviour? Let's delve into the world of invertebrates to uncover the secrets behind matriphagy.

What is Matriphagy?

Matriphagy is a phenomenon observed in various species of invertebrates, including insects, arachnids, and crustaceans. In these cases, offspring consume their mother either before or after birth, depending on the species (Dias, *et al.*, 2021).

Understanding the Reasons:

While matriphagy might seem shocking to us, it serves specific purposes in the animal kingdom:

1. **Nutritional Benefits:** In many species, the mother provides essential nutrients to her offspring through her body. By consuming her, the offspring gain immediate access to these nutrients, aiding in their growth and development.
2. **Competition Reduction:** In some cases, the mother's presence can pose a threat to the survival of her offspring by competing for resources or even preying on them. Consuming the mother eliminates this competition, ensuring the survival of the offspring.
3. **Space and Resources:** In environments where resources are limited, matriphagy allows the offspring to quickly gain access to valuable resources that the mother would otherwise monopolize.

Examples in Nature:

Matriphagy is observed in various species across different taxonomic groups:

1. **Spiders**: Some species of spiders exhibit matriphagy, with spiderlings consuming their mother's body after hatching. This provides them with essential nutrients for their early development (Tripathi, *et al.*, 2020).
2. **Praying Mantis:** Female praying mantises are infamous for their tendency to cannibalize their mates. In some species, newly hatched nymphs may also consume their mother if she does not evade them.
3. **Insects:** Certain species of insects, such as beetles and cockroaches, demonstrate matricidal behaviour. Larvae may consume the body of their mother to gain vital nutrients for their growth (Suzuki *et al.*, 2005).

Evolutionary Implications

JUST AGRICULTURE
multidisciplinary e-Newsletter

The phenomenon of matricide in invertebrates raises intriguing questions about the evolutionary pressures that drive such behaviour. While it may seem counterintuitive for offspring to consume their mother, this strategy offers significant advantages in terms of survival and reproduction. By cannibalizing the mother, offspring gain vital nutrients and reduce competition for resources, thereby increasing their chances of survival and reproductive success.

Ecological Significance

Matricide in invertebrates also has broader ecological implications. In some cases, it helps regulate population densities and maintain ecological balance within ecosystems. Additionally, by ensuring the survival of the fittest offspring, matricide contributes to the overall resilience and adaptability of these species in the face of environmental challenges.

Ethical Considerations

While matricide in invertebrates may seem brutal from a human perspective, it's essential to remember that these behaviours are driven by instinct and evolutionary pressures rather than malice or cruelty. As observers, our role is to understand and appreciate the complexities of nature without imposing human-centric moral judgments.

Implications and Further Research

The study of matriphagy offers valuable insights into the complex behaviours and survival strategies of invertebrates. Understanding the underlying reasons behind this phenomenon can shed light on broader ecological dynamics and evolutionary adaptations.

Conclusion

In conclusion, matriphagy in invertebrates offers a fascinating glimpse into the intricate web of life on our planet. From spiders to insects, these organisms have evolved remarkable strategies to ensure their survival and reproductive success, even if it means consuming their mother. By studying and understanding these behaviours, we gain valuable insights into the diversity and complexity of life forms that inhabit our world. In the strange and captivating world of invertebrates, matricide stands out as a testament to the ingenuity and adaptability of life in all its forms. As we continue to explore and unravel the mysteries of the natural world, let us approach with curiosity, awe and a deep appreciation for the wonders that surround us.

References

Dias, M. D. F. R., Rios, V. P., Vasconcellos-Neto, J. and Viera, C. (2021). Matriphagy in five species of the genus *Anelosimus* (Araneae: Theridiidae). *Behaviour*, 159 (3-4):377-384.

Kim, K. W, Roland C. and Horel, A. (2000). Functional value of matriphagy in the spider *Amaurobius ferox.* Ethology. 106 (8):729-742.

Suzuki, S, Kitamura, M. and Matsubayashi, K. (2005). Matriphagy in the hump earwig, *Anechura harmandi* (Dermaptera: Forficulidae), increases the survival rates of the offspring. Journal of Ethology. 23 (2):211- 213.

Tripathi, R, Jangid, A. K, Siliwal, M. and Dutta, S. (2020). The first report of matriphagy in *Stegodyphus pacificus* Pocock 1900. Acta Arachnologica. 69 (1):17-21.