AGRI MAGAZINE
(International E-Magazine for Agricultural Articles)
Volume: 02, Issue: 12 (December, 2025)
Available online at http://www.agrimagazine.in

Physogastry in Honeypot Ants

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Honeypot ants, also called honey ants, are ants which have specialized workers—repletes, plerergates or rotunds—that consume large amounts of food to the point that their abdomens swell enormously. This phenomenon of extreme inflation of the trunk is called physogastry. Other ants then extract nourishment from them, through the process of trophallaxis. They function as living larders. Honeypot ants belong to any of several genera, including Myrmecocystus and Camponotus. They were first documented in 1881 by Henry C. McCook, and described further in 1908 by William Morton Wheeler.

Behaviour

Many insects, notably honey bees and some wasps, collect and store liquid for use at a later date. However, these insects store their food within their nest or in combs. Honey ants are unique in using their own bodies as living storage, used later by their fellow ants when food is otherwise scarce. Designated worker ants, called "repletes," are the main group that store food for the colony. Repletes are fed by other worker ants until their abdomens become swollen with honey.This extreme growth causes the repletes to become mostly immobile as they act as the "living pantry" for the colony.When the liquid stored inside a honeypot ant is needed, the worker ants stroke the antennae of the honeypot ant, causing the honeypot ant to regurgitate the stored liquid from its crop.

Anatomy

The honey from honeypot ants is unique. Like bee honey, it has antimicrobial effects against pathogens and decay organisms, but it differs from bee honey, for example in having a higher moisture content. Honeypot honey has a significantly lower concentration of sugar than bee honey. The ant honey is not concentrated only from nectar and other sweet components of the diet, but also from metabolites of plant and animal food sources in general. The honey has a slightly acidic Potential in Hydrogen.

Ecology

Myrmecocystus nests are found in a variety of arid or semiarid environments. Some species live in extremely hot deserts, others reside in transitional habitats, and still other species can be found in woodlands which are somewhat cool but still very dry for a large part of the year. Honey pot ants have been reported to be in the USA, Mexico, the African continent and Australia. Sterile workers in this species act as plerergates or repletes during times of food scarcity. When the plerergates are fully engorged, they become immobile and hang from the ceilings of the underground nests. Other workers drain them of their liquid food stores to feed the rest of the colony. Plerergates can live anywhere in the nest, but in the wild, they are found deep underground, unable to move, swollen to the size of grapes.

In *Camponotus inflatus*, repletes formed 49% (516 ants) of a colony of 1063 ants and 46% (1835 ants) of a colony of 4019 ants. The smaller colony contained six wingless queens. The larger colony had 66 chambers containing repletes, with a maximum of 191 repletes in a chamber. The largest replete was 15 millimetres long and had a mass of 1.4 grams. The nest

had a maximum depth of 1.7 metres and tunnels stretched 2.4 metres from the nest entrance. The workers went out foraging during daylight to collect nectar from *Mulga* nectaries and meat from the carcass of a *Tiliqua* blue-tongued lizard.

Bee honey is an effective natural remedy for a wide range of ailments. But very little research has been done on other types of honey, produced by different insects. The antimicrobial activity of honey from honey pot ants was tested and compared to the antimicrobial activity of bee honey. It was found that honeypot ant honey has activity against bacteria, yeast and mold. When honey pot ant honey was compared against bee honeys, a distinctly different activity profile was found. Honey pot ant honey outperformed the other two honeys against some pathogens, but exhibited low/no activity against other ones.

Myrmecocystus honeypot ants, showing the repletes or plerergates, their abdomens swollen to store honey, above ordinary workers

Honeypot food storage has been adopted in several seasonally active ant genera

- *Camponotus*
- *Cataglyphis*
- *Leptomyrmex*
- *Melophorus*
- *Myrmecocystus*
- *Anoplolepis* and *Tapinolepis*
- *Prenolepis*
- *Brachymyrmex*

Cultural Significance

Honeypot ants such as *Melophorus bagoti* and *Camponotus* are edible insects and form an occasional part of the diet of various Indigenous Australians. These people scrape the surface to locate the ants' vertical tunnels and then dig as much as two metres deep to find the honeypots. The honey ants were celebrated in the Western Desert Art Movement's *The Honey Ant Mural*, painted in 1971. In Central Australia, there is a Honey Ant Dreaming site that is shared by all indigenous groups around the area. For these indigenous groups, the honey pot ant represents their Dreaming, the philosophy based on the spiritual connection between people and things.

Honeypot ants are an important part of the culture for Australian Aboriginal people. A Tjupan legend says that mothers who sit and gather honey ants for long periods of time, will start to neglect their children, leaving her and her children vulnerable to enemies who want to stay. This story has been passed down from many generations to remind women to be aware of their surroundings when sitting and gathering. For numerous indigenous groups,

collecting honey ants is viewed as a women's job. Digging for ants is viewed as a social gathering for women to converse and interact. Children are often included so they learn the cultural and location-specific knowledge in locating the underground ant colonies.

Indigenous Medicinal Use

Indigenous Australians from the Tjupan language group use honeypot ant honey to treat sore throats, colds, and as a topical ointment to treat skin infections. A Sydney University study has investigated the efficacy of honey from Camponotus inflatus, and found it effective against the bacterium Staphylococcus aureus, and the fungi Aspergillus and Cryptococcus. The antimicrobial mechanism is significantly different to that of Mānuka honey.

References

1. Dong, Andrew Z.; Cokcetin, Nural; Carter, Dee A.; Fernandes, Kenya E. (2023-07-26). "Unique antimicrobial activity in honey from the Australian honeypot ant (*Camponotus inflatus*)". *Peer J*. 11 - 15645.
2. Schultheiss, P.; Schwarz, S.; Wystrach, A. (2010). "Nest Relocation and Colony Founding in the Australian Desert Ant, *Melophorus bagoti* Lubbock (Hymenoptera: Formicidae)". *Psyche: A Journal of Entomology*. 2010: 1–4.