

Ant mimicry: An adventure for life

Madbusudan, M

Every living organism interacts with other organisms and gets benefited for its existence and survival in this world, one or the other way. Some are parasitic, some are predators and some are even mutualistic, but what I want to recount here is way different from these. In this case, an organism gets benefited from other organism usually without any direct interaction. Yes! that is “mimicry”. By mere copying the shape and color of the well protected species, let’s call it ‘model species’, the beneficiary species, let’s call it ‘mimic species’, gets protection from its enemy (predator) or by mimicking the other species help them to gain access to food resources of the model species or the later can be achieved just by mimicking the chemical, such as, cuticular hydrocarbons of the model species.

In this article, I am going to discuss about such extraordinary mimic-model systems associated with the ants that I had encountered during COVID-19 lockdown days around my university campus. In this story, ants are models. Let me advocate ants for qualifying them to be “models”. Ants are generally avoided by many predators, because of its bite, sting, defensive chemicals it produces and also, they taste bitter/sour. By mimicking these nasty, tasteless ants, mimics may get the protection from its predators (it is called ‘Batesian mimicry’). Secondly, does mimic get any direct or interactive benefits by mimicking the model? Yes! we all know how fierce ants are, so by mimicking the body or the behavior or even smell, they perfectly

deceive them. Being able to go near the prey without giving a clue is a great deal to the predator, here mimic, and this type of mimicry is called ‘Aggressive mimicry’.

One day, on my way to the laboratory, I was parking my bicycle under a cashew tree. I happened to see an ant with unusual behaviour! Ant that was on tree bark suddenly dropped down with a silken thread! I haven’t seen or heard of ants that are capable of producing silken threads. Alas, I found a new species! Then, I carefully observed it closely. No, no, no! It is not an ant! It is a spider. It was mimicking a weaver or red ant. It had a pair of pedipalps, front legs which looked exactly as antennae and used as antennae, and totally four pairs of legs. That spider is *Myrmarachne plataleoides*, belonging to the family Salticidae. They are jumping spiders and they live in trees and bushes near the weaver ants’ nests, and they hunt down the ants when they find them singly. Poor ants become the prey because they get deceived by their own skin tones wore by spiders.

Another day, when I was doing my research in a glass house, there was another spider which was exactly mimicking an ant, but this was a different one. It was *Myrmarachne melanotarsa* which mimics *Crematogaster* sp. ant. As I had seen an ant mimicking spider few days back, I could easily identify it as a spider with little observation. As I approached the spider, it showed typical spider behaviors by turning to its back, moving sideways, trying to hide

etc. What bewildered me most aren't these ones, but of its precision of mimicking! even the color shades, shape & size of the body were similar to *Crematogaster* sp. When I googled about it, I got something very intriguing story about it. It was called as 'Collective mimicry' or I would say 'Social batesian mimicry', a mimicry at the next level. Unlike the previous case, where the spider lives in the same habitat of the ant, here this spider lives in a very close proximity often inside the ant colony/nest, much more intricate part is even sharing the living space with other salticid spiders, mostly *Pseudicius* spp. *Memerus* spp. and also with a non-salticid spider, *Hersilius caudata*.



Fig. 1. Top image- *Myrmarachne plataleoides* (mimic), bottom image- *Oecophylla smaragdina* (model) (Image Courtesy: Project Noah)

Aren't these spiders risking their lives by living in close proximity with fiercest ants? And when they are ready to risk, are there any benefits? Well, ants can steal the eggs and juveniles of the spiders, let's consider this as a main loss, but here comes an advantage to the mimic, *Myrmarachne melanotarsa* which mimic social insect (ant), this spider deceives other spiders in the nest complex and steal those spiders' eggs and juveniles. Second benefit

is, for enemies of mimic or even for us, it is difficult to distinguish mimic from model-when a group of *Myrmarachne melanotarsa* and swarm of *Crematogaster* ants present together. Even when predators try to prey on them, ants may come for rescue thinking of them as conspecifics. And other spiders associated with ants and the mimic also get protection from their enemies as many predators avoid ants, which are actually around these spiders. Comparing all these, a little loss of eggs and juveniles might be compensated with these protections.



Fig. 2. *Crematogaster* sp. (Image Courtesy: bugguide.net).

Recently, I got to see another insect which was mimicking an ant. To my surprise, it was a hemipteran insect (bug) bug which was mimicking. I never thought a bug can mimic an ant to this extent. Unless you go near and closely observe it, for sure, you will not identify it as an ant. Well, any mimic would leave some clue to unravel its mystery. In this case, my first clue was its antennae. It had typical heteropteran filamentous antennae and when I looked at the bug from the lateral side, I could easily see its beak/proboscis, not just that, I also observed it piercing into the plant tissue. By the way, this 'crazy' bug belongs to the family Alydidae, genus *Dulichius*.

When I searched on the internet, I found loads of insects which mimic ants, some examples are- crickets, freshly hatched phasmids, thrips, flies, mantids and even beetles. What amazed me most is that even plants mimic ant's presence by having dark dots and stripes on their flowers to deter ant avoiding predators/herbivores! Isn't this astounding?

Ants are always extraordinary and like 'Superheros' of animal kingdom. One way of defeating or get benefited from them, at least in this background, is by being like them.

AUTHOR

MADHUSUDAN M.- Sr. MSc. Agricultural Entomology, Department of Agricultural Entomology, University of Agricultural Sciences, GKVK, Bengaluru, Karnataka, India
