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Resorts of the Thief Ant

When you look at this thief ant, you see desperation. In a world of infinitely numbered and towering dangers, the mere privilege of existing is more difficult to the ant than most. This particular species, the thief ant (*Solenopsis Molesta),* lacks the few benefits even other ant species possess. It has a weak stature, poor defenses, soddy environment, and is individually trumped by almost every other animal on Earth larger than a staple. It stands no chance against almost all of its neighbors, and can barely survive off its own means. Yet still, with all these limitations, this creature manages to be undeniably successful. This is because, with the entire world against them, thief ants know how to deal with desperation. It's by no means a perfectly content life, but it's one that allows their survival. They perfectly exemplify the measures taken by the desperate to spin disadvantages into boons and to endure through their tribulations.

Beyond their genus name, *Solenopsis*, being just another Latin word assigned to just another animal, it actually shares a genus with the more well-known fire ant, *Solenopsis Invicta* (Murray). Despite basically being evolutionary cousins, the two species couldn't be much more dissimilar in their perception. Fire ants, for example, have garnered a rather intense image for themselves. They have a famously painful sting, and an evocative common name to reflect it. Hearing about them no doubt generates a fear of any ant with a reddish tint, as I know it did for myself as a child. The base instinct humans have to deeply fear the attacks of bees, spiders, anything similar spreads to the fire ant, solidifying their presence in human knowledge.

The thief ant, in contrast, has a far less evocative reputation. Despite their close relation, they have no quality means to bite or sting (Murray). With not an ounce of venom in them, their means of defense is considerably lower. This with the consideration of their significantly lower size (fire ants being up to 6 mm long, thief ants rarely exceeding even 2 mm and are more often around 0.5 mm) and you have what appears to be a straight downgrade species to species. A fire ant is larger, more dangerous, and more feared than even a queen thief ant. This disparity of natural viability is not only palpable by their reputations, but by their habits as well. Thief ants can't go out and directly compete with other animals, or they'd stand zero chances of getting back alive. They simply don't have the tools at their disposal. Instead, they have a very unique habit of actually nesting near or even inside other opposing ant nests, and stealing whatever they can. They take the other ants' food, and sometimes even their brood for consumption. They're able to infiltrate nests of much more dangerous and successful ants, taking their resources right from under their noses (Note: ants don't have noses. Under their antennae, if you will). Their reasoning and means of how this has become a dependable enough strategy to base their entire species on are put in question when considering the threats they face.

Their perception by the common human isn't exactly flattering, either. Their most common perception isn't just as an interesting insect with unique behavior, but instead as a nuisance pest to eliminate. The vast majority of online sources about them are strictly tutorials on how to kill invading thief ants. Take one article from *The Spruce* by Lisa Lupo, which describes this fascinating species only in how to eliminate it. The other common names for this species, such as "grease ant" and "sugar ant," have been coined and popularized because of the nature of what sort of spills they're most attracted to, as well as what baits to use to kill as many as possible. This reaction isn't entirely unfounded, as the instinct of purloining food extends to their

human hosts as well as their ant hosts. Even though they pose absolutely zero direct threat, they have the potential to spread diseases between the food containers they break into. Even so, the fact that more is known about them as a pest, other details aren't as sought after.

Their desperate perception is also thanks to the fact that their presence as a pest is much easier to study than their presence in nature. In terms of academia, in-depth research for thief ants' natural processes has actually been relatively slim for several reasons. For one, the differences between species of thief ant are incredibly difficult to define. The species of *S. Molesta* is one of many that shares the same yellowish body, anatomical shape, and social behaviors with many other species of the same genus across the Americas, oftentimes the clearest distinction only being at a DNA level (Narain). William Mackay in his study *The systematics and biology of the new world thief ants of the genus Solenopsis (hymenoptera)* speaks to how this difficult of taxon distinction has made research that much harder, "Their small size and somewhat scant morphological differences between the species have been a strong disincentive for revisionary work by myrmecologists [studier of ants], with most treatises being geographically restricted in scope." A second reason for the historical lack of research, briefly hinted at by the aforementioned Mackay quote, is their incredibly small size. Compared to a larger ant species, the difference in size would be comparable to the difference between a chihuahua and a great dane, which makes studying them that much more difficult. Additionally, their burrowing lifestyle keeps them below the surface level and away from most human eyes. Mackay, in regards to current researchable exhibits, states that "Most of our material has been collected from litter extractions and subterranean bait traps" (Mackay). Since any objective analyses of thief ants are few and far between, and more interactions with them are as an intruder, most human actions regarding them are violent. It's not common for an animal to find

refuge in humans that they couldn't find in the wild, but the thief ant will never know that privilege with their reputation. With all the disadvantages thief ants suffer from, with their dependency on other animals for survival, how is this ant as successful as it is?

Before being able to understand how much more desperate the thief ant is compared to its evolutionary peers, it's important to take a step back and establish the sheer scale of the ant family, scientifically called *Formicidae*. Despite being tangentially studied for millennia by children watching ant lines walk past or by ancient scholars looking for more things to credit to their god, ants weren't actually professionally studied in any standard way (Gordon 1). Their affinity for social unity and impeccable work ethic has been noted since the Old Testament, with Proverbs 6:6-8 stating, "Go to the ant, thou sluggard; consider her ways, and be wise: Which having no guide, overseer, or ruler, Provideth her meat in the summer, and gathereth her food in the harvest." This particular depiction paints the ant as a leaderless creature with a motivation to be solely productive, not needing any other purpose beyond that.

More detailed interpretations of ant structures won't be made until much into the scientific revolution when intense study of the annals of nature becomes popular enough to look at something so seemingly small and to see how such minute creatures overcame their desperate circumstances. Even so, a bias of political institutions at the time invades any occurring study. According to *Ant Encounters: Interaction Networks and Colony Behavior*, the nomenclature of calling a reproducing female a "queen" and all other infertile females "workers" comes from the ingrained belief at the time that a system of royalty was the best way any society could be structured. Naturalists at the time interpreted ant social structures as "a group of subordinate laborers happy to serve their monarch. Although these names imply a hierarchy that in other times… was known not to exist, the names 'queen' and 'worker' have stuck" (Gordon 2). Of

course, royalty is solely a cultural institution invented by humans, and such traditions don't exist in nature. The queen of an ant colony has no sort of administrative power over the functions of the colony, nor does she motivate any other ant in their own functions. Her role is solely to reproduce, just as the workers' role is solely to work. In this sense, somewhat ironically, this is a rare instance where the biblical assumption from antiquity is actually more accurate than an idea post-scientific revolution.

With more scientific study into ant ecology, more accurate interpretations of their structures were made along with the growing reputations as small but powerful, still keeping the admittedly outdated nomenclature. Instead of any sort of hierarchy, ant colonies were more described as a unified community with a single will connecting them, each member dedicating their life to work day in, day out, for the betterment of the colony. They're bound by instinct explicitly to work together, not to obey any power beyond their desire for unity. As said by Deborah Gordon, a professor in biology at Standford University, contemporary evolutionary biologists are "comparing the ant colony not to a kingdom but to a single organism, with the queen and workers all acting as cells that contribute to the life of one reproducing body" (Gordon 3). With this considered, it's no question why there's not a single species of ant on Earth that doesn't function on some social structure, and instead on individual ants making their mark out on the world. If they had ever tried, that species undoubtedly went extinct within a couple of generations, because ants, much like humans at our core, are first and foremost a community animal. This strategy proves successful across the board. As an example, a supercolony exists of Argentine ants flourishing in southern California with billions of ants part of it. One colony, one species, one sub-section of a US state, with a population rivaling that of mankind (Moffett 9).

This variance of vast populations certainly isn't foreign to the thief ant. This species has colonies in every single state of the continental US, even spreading to southern Canada and northern Mexico. In addition, their close relatives *S. Helena* are spread in much higher populations in Central and South America (Mackay 450), making those that go by this common name are a true staple of the New World. The reach of their influence is remarked by Mackay, "Thief ants are among the most common ants in nearly all terrestrial habitats, ranging from the driest deserts to the wettest tropical forests" (Mackay 10).

Again, the actual reasoning for their success comes to question. Successful ants aren't a rare phenomenon, it's a perfectly practical system they have: one of mass dedication to a single community, as discussed before. But ants that are usually as successful often have more qualities to their name than just theft. Take a genus like the weaver ant, the definition of an architectural empire. Like most ants, weaver larvae produce silk to cocoon themselves before transforming into adults. The weaver ants actually use this silk from their young to glue tree leaves together, using their children like glue guns. Weaver ant workers tower on top of each other to reach other leaves to pull and bend down, gluing it to the original. They repeat this task however many times it takes to make an aerial nest high in the trees, a fortress far above most dangers and close to major food sources (Moffet 114). A single colony can construct any amount of these leaf fortresses, creating several castles for invaders to be stopped at before reaching the central nest. They have a complex system of communication, being able to convey information about food sources, threats, or other parts of the colony with a combination of pheromones, body language, and fecal matter (Moffet 115). These weaver ants regularly create and manage empires more successful and stable than any other, even in human history.

To dig into martial capabilities, there's also the voracious marauder ant. This variety has unique sub-classes in their social structure: minor and major workers. Major workers are several times larger than minor ones, large enough to fit several on top of one. I say this because this is exactly a strategy they use during their hikes, to have dozens of minors mounting a major to foraging (Moffett 14). Or, more accurately, to battle. A large percentage of the marauder ants' food comes from organized raids against other beasts. As omnivores, they still forage from the wilderness, but a colony has no shortage of military conquests under its belt (Moffett 45). Their tactic of battle revolves around the dynamic between these sub-classes, where disposable minors would throw themselves at a threat like cannon-fodder until they pinned it down, allowing the giant major to come in and crush it to death (Moffett 26), like knights of old securing a victory after great loss of the peasantry. This is a sensible strategy, as majors are much more difficult to replace. Whether the large prey is killed or merely stunned, the workers, almost ritualistically, tear off its limbs for easier delivery. Mark Moffett, an award-winning Smithsonian researcher, noted, "I once saw the ants retrieving a limbless gecko, which clued me in that they had taken it alive" (Moffett 42). This is the opposite of desperation. This is the overwhelming domination of the threats around them.

These extreme examples of the diversity of strategies in ants should paint a clear dichotomy of power. Obviously, none of these lifestyles are particularly ethical by any means, no one's arguing for the benefits of child labor, imperialism, military conquest, and live-dismemberment. But even without the grand qualities of these insect superpowers, thief ants have no shortage of successes on their own. In terms of being able to survive in the wild, none of these stated ant societies seem any less successful in terms of population. Is there really that little

of a difference between the viability of their strategies? Perhaps the route of thievery, at least in the animal kingdom, is more advantageous than assumed.

Thievery actually isn't an instinct unique to the thief ant. This behavior, coined in a wider context as kleptoparasitism, is performed by many other animals that steal any resource from others, not just food (Iyengar). The group of animals this behavior is most common in, as well as most studied, is flying birds stealing either food or nest materials from other animals. A study by Erika V. Iyengar examines all known behaviors of kleptoparasitism and notes that one of the biggest prerequisites for this behavior is that the "net gain from kleptoparasitism (accounting for elevated risks) is greater than from independent foraging" (Iyengar). Meaning that any risk entailed from encroaching on a host's territory to directly steal their resources must be less likely than getting away with it, otherwise, any species that attempts it regularly would die off. This is no issue for birds, given their unmatched agility in the animal kingdom. The same study clearly paints the difference of anatomy needed to pull off this behavior, "Many aquatic animals are sessile, and even the mobile aquatic and terrestrial invertebrate hosts are usually restricted to two-dimensional non-acrobatic movement (e.g. sea stars, crabs, ants and bees in nests, spiders on webs). Even among terrestrial vertebrates, most do not engage in the fast-paced, acrobatic interactions typical of birds" (Iyengar). Notice, especially, that ants are explicitly described as being too sedentary and too unagile to be on the winning side of kleptoparasitism. They're just too slow, too limited by their environment to compete. It's why the vast majority of ants either depend on peaceful foraging or head-on warfare, because stealing shouldn't work.

But of course, it does for the thief ant. Almost every detail of their behavior seems paradoxical, but it still works. The hand they've been dealt by their physical disadvantages forces them into a state of desperation, where they have low odds if any of stable survival. And yet they

survive. More than that, they succeed, dotting the New World with no grand existential threats to speak of. Through desperation, how can such a physically weak species make such a mark? Really, it's simple. For the thief ant, less physical strength isn't a weakness, as they've spun that quality to be their greatest weapon: stealth.

The greatest empires of mankind have never succeeded in weeding out petty criminals. It's an impossibility, the alleys and gutters being too vast and hidden to entirely sweep. This is the same for *S. molesta* and their pitifully small size and strength. Because they pose no threat to other stronger and larger ants, they're largely ignored. Only a perceptive ant would even be able to notice the thief ant's presence, especially because of their heavy reliance on burrowing. Most in the wild live strictly underground, coming to the surface only when there's no food in the subterranean world (Mackay 10). Bert Hölldobler and Edward Wilson in their Pulitzer Prize-winning tome *The Ants* (a text I would go as far to say is the Bible equivalent of ant study), wrote about how "...colonies of the 'thief ants'... often nest next to larger ant species, stealthily enter their chambers, and prey on their brood" (Hölldobler 446). There is not much defense against a pest bursting through the walls to steal food and babies, so more often than not they're able to get away with it without ever facing the larger ants they're infesting. The ratio of risk and appeal that Iyengar described before is met, giving thief ants plenty of motivation to use and abuse this source of food. Hölldobler and Wilson gave this behavior a more accurate name than even "kleptoparasitism," describing it as "lestobiosis," a specifically covert method of stealing resources (Hölldobler 446). Their size is used as their biggest blessing, not as a crippling characteristic as assumed. This combined with other signature ant perks such as an affinity for burrowing, hard-working and disposable workers, and having efforts unified for their entire

community, provides a unique mixture of qualities to make a system of food procurement not only viable but dependable as well.

The evolution of ant behavior is intrinsically associated with whatever food source they have available. For most of their evolutionary history, they've evolved around the flora in their habitat. Gordon, in elaborating on this relationship, states, "The evolution of the ants is the story of how colony social organization has developed, expanded, and diversified in response to plants" (Gordon 121). Considering that the vast majority of ants are either strict herbivores or flexible omnivores, plant life is a major source of nutrition for any colony. As colony-makers, many use living and dead flora as the foundation for their nests. Recall the weaver ants making their aerial fortresses from the top leaves of trees, and even thief ant species use dead logs as their homes (Mackay 129). As communal foragers, ants use pheromones to convey to each other where stable food sources are. Since any food they'd find would be confined and concentrated in one area (think of a rooted plant or large animal remains), any ant that would run into it could return to the colony, leading pheromones saying "I got this food at the end of the path I've made behind me." This information isn't an order or directive, just a statement of fact that other ants instinctively react to (Gordon 48). After all, the sole purpose of these workers is to return food, so any implication of food in any direction will stir a crowd.

Although most of ant history has been the symbiotic relationship between ants and plants, the truer description would be between ants, as desperate as they are, and an immobile replenishing food source. The very nature of a community depends on a stable long-term food source. This is why humanity's agricultural revolution brought mankind from nomadic tribes to early civilizations, and it's why ants are so successful in the niche they fill. With these concepts in mind, it's far more realistic to imagine an ant species evolving to steal from other ants' food

reserves. After all, the fact that ants depend on stable food sources logically leads to stable living for the sake of their reproduction and food storage. And what source of food is more stable than a nest being continuously stocked with food and larvae?

By human conventions, none of this seems particularly moral. But in this violent and desperate ant-eat-ant world, ethics aren't even considered for the sake of survival. As a species with as few physical attributes, as much competition even in their own family, and as much despisal by the humans they may depend on, thief ants should be understood as creatures forced into their peculating lifestyle. Thievery has the same motive in human societies as in evolutionary biology: a symptom of harsh circumstance, a resort by the desperate just to survive. Not only is it a way to circumvent the disadvantages they suffer, but they're especially successful at it because of their physical limitations. Desperation is a driver for the opportunistic, albeit the greedy. Thieves are sole takers, but so would everything if they were as outdone and as overlooked as this little yellow ant.

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