Preliminary Report On The Discovery And Analysis Of *Coptotermes Mazabureinus*

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Abstract

Following the capture and retrieval of seven queens by an employee in the field, we have identified a new species of termite and taken the liberty of naming it *Coptotermes Mazabureinus*, after the Japanese phrase for “large headed mother” as suggested by Dr. Jones. While initial readings of the debrief led us to suspect that the termite infestation on Vice-Administrator Shan’s property represented just another example of *Coptoterme Formosa* (the so-called “super termite”) at work but the even more extreme physogastrism visible in the presented specimens quickly put that assumption to rest. Dr. Jones and Dr. Goto both speculated that based on the extension of the epicuticle, these specimens were likely already several years old and set about testing their levels of fecundity and trying to recreate the subterranean conditions which the termites were originally found in, so as to generate a good nesting environment. Dr. Callis and Dr. Yun performed genetic testing to verify the termite’s status as a new species.

Introduction

Scientific perception of termites has shifted over the past few decades as the dust has settled around the debate on where termites truly rest taxonomically given the mounting evidence that, if not directly descended from wood-consuming *Cryptocercus*, they undoutedly must share a common ancestor within the suborder *Blattoidea*. The issue was finally settled when a new species, *Cryptocercus Communus* was discovered deep in the South American rainforest by the rightly famed Doctor Rodriguez and his team of SAN researchers two years ago. *Communus* represented a preserved link between the hooded roaches and the termites as we know them, exhibiting primitive eusocial behavior complete with irreversible specialization within small colonies of 200 or so *Communus* and a reproductive system centered around clusters of still mobile “pseudo-queens”.

This meant that *Isoptera* was to be downgraded to a mere epifamily, as it recently was. It has since been the view of some individuals in upper echelons of GEC labs bureacracy that the responsibilities for study of *Isoptera* should therefore be handed off to those with a specialization in *Blattidae*, as internal lab specializations tend to be assigned to family-level taxonomic groups. As the 3,000+ different species of termite continue to mount in number and are now added to by *Coptotermes Mazabureinus*, Dr. Goto and his team would like to reiterate the importance of experts like Dr. Goto in dealing with the growing populations of termites around the world and their many recent mutations. Dr. Goto is invaluable to the organization and without his input this report would be much less comprehensive.

Purpose

The purpose of this project was to analyze the physical characteristics of *Coptoterme Mazabureinus* and assess its overall fitness, its taxonomic status, and whether or not it would have useful attributes for commercialization, weaponization or both.

Methods and Materials

For the purposes of dissection a standard array of robotics were used on exactly one of the queen specimens and several dozen offspring belonging to different varieties of castes. For reasons to be explained later in the paper, dissections are still ongoing.

For habitat recreation, specimens were first released into small standard issue artifical nests, designed to replicate the temperature and moisture conditions of a typical termite nest. This meant that the queens were warmed to about 22.2 degrees Celsius which turned out to be too cool for efficient reproduction. Conditions were adjusted to 24.7 degrees and fecundity was found to increase dramatically. Though this seems to be an optimal temperature there seems to be little upper limit on what the termites are comfortable with, with survival not being seriously afffected at temperatures up to 44 degrees Celsius.

Once each specimen had produced approximately 30 eggs, the artificial nests were placed beneath several feet of dirt with at least one passageway to the surface. Further observation was then conducted by cameras placed inside the nest. Several varieties of soil were used but soil choice made little to no difference on survival of the nest for reasons that are explained in the results section of this paper. *Mazabureinus* did however show a strong attraction to concentrations of clay contained within our testing environments, preferring to line the walls of its tunnels and chambers with a mixture of clay and a powerful self-produced orange adhesive whenever possible. This preference was seen as another similarity to *Coptotermes Formosa.*

As the colonies were established, each one was exposed to a wide variety of different drywoods, as it was hypothesized that *Mazabureinus* might, as with Formosa, prefer different varieties of wood for their respective nutritional values. Based on the findings of Juan A. Morales-Ramos and M. Guadalupe Rojas in their paper Nutritional Ecology of the Formosan Subterranean Termite, we tested for and found a high level of attraction to pecan, red gum, and American ash wood, with the greatest preference being for the

American ash. There was not sufficient time to test the long term effects of exclusive diets but a follow-up paper should tackle the issue.

Dissection Results

For the purposes of the study one Queen specimen and several examples of workers and soldiers were dissected.
A King specimen which could not initially be located was later found within the Queen, having been absorbed into her anal region.

Queens:

The Queen had an average length of 33.5 centimeters with the epicuticle fully extended. More notable was the epicuticle's remarkable girth of 16.1 cm, giving the Mazabureinus its characteristic rugby ball like shape. Upon dissection, the ovaries were found to be immensely swollen. In fact, at 272 grams each, the intricately braided ovaries were found to represent 67% of the Queen's total body weight.

During the dissection of Queens posterior, the vestigal remnants of the male alate were also found not far from the otherwise very standard dual ovipositor bulbs. His inclusion into the female form effectively makes the Queen a self-impregnating hermaphrodite but he also seems to serve as a surprisingly complex endocrine organ and may have a role in epigenetically managing the characteristics of the queen's offspring, as theorized by Dr. Goto. Several of the chemicals produced within his body are still under chemical analysis in our labs and may be saleable as aphrodisiacs or perfume ingredients. The epicuticle also contained the usual array of sweat glands, which lab observation confirms are attended to by workers. Sweat analysis is ongoing.

More interesting, from an entomological standpoint, were the decidedly oversized head and thorax of the Queen. The thorax was found not only to be retractable but also to contain an unusual amount of interconnected nerve matter, which Dr. Goto speculates is related to the complicated sensory organs on very clear display in the queens head. With eyes the size of quarters and long prehensile antennae, the Queen is abnormally well-equipped for observation and tracking of the outside world and, as lab observations confirm, reacts to external stimuli in a manner that suggests a strong self-preservation instinct by yanking its thorax deep into its own body. The reasons for the normally vestigial elements of the queen being so highly devleoped are currently unknown.

Workers and Soldiers:

In the first generation of births, the team discerned no difference from the standard measurements for a Coptoterme Formosa and
workers and soldiers were easily distinguished by their white and red heads respectively. As with Coptoterme Formosa, the soldiers produced napthalene as what can only be assumed is a defensive mechanism.

In the later generations, anatomical features began to change and morph, seemingly in response to environmental conditions. For example, colonies presented with harder woods developed larger and more "molar" like mandibles that allowed for efficient

consumption of wood. In all colonies, soldiers shrunk slightly and produced lesser amounts of napthalene. Morphological changes are continuing to be observed and we have only had a short amount of time to observe the reasoning for this.

Observational Summary

Although very similar to *Coptotermes Formosa* and likely a derivative species, we discovered a large number of deviations from the usual habits of Formosan termites. The most important of these have been bulleted below:

- Egglaying capability of the Queen is about thrice that of Coptoterme Formosa, at 100 eggs per minute in the ideal temperature range. As a result, a vast amount of cellulose is required to keep the nest running and fecundity will drop off significantly if it is not provided. Additionally, termites will become more sluggish, seemingly aware of the need to consereve energy.

- The Queen is not only fed via trophallaxis but presented with samples of celulose sources and bits of stone and minerals. These particles are generally not consumed but instead carried off to an adjoining chamber. Some particles are simply passed through the queens chamber and into this “trophy room”.

- As noted, later generations display adaptive traits. Dr. Goto insists that this is due to an epigenetic mechanism within the Queen related to the absorbtion of the male alate but it is too early to determine the validity of this.

- In the absence of external threats, workers are becoming smaller and quicker and ranging out towards the outer corners of the habitats. We noticed a few of them tunneling and even jumping off the glass walls of the enclosure.

- Following the detection of a fresh food source saturated with 3% glucose, the worker responsible for the discovery was carted off by his comrades and deposited in a small chamber where he was held in place by a member of the soldier caste. Once three hours were over, both soldiers consumed the scout and rejoined the colony. The food source was consumed en masse shortly thereafter.

- Many, though not all, of the colonies began producing what appeared to be winged alates after 10 hours in the artificial habitats. Simultaneously, workers began building small towers on the surface of their habitats.

- A small additional chamber has been built to house the Queen’s fecal matter.

Genetic testing Results

Genetic testing of Mazabureinus showed 99.96% overlap with Coptotermes Formosa, enough to show reproductive incompatibility and grant the confidence to designate Coptotermes Mazabureinus as its own species.

For V.E. only!

Mazabureinus is UNIQUE until we find other specimens in the wild. And despite Goto taking all the credit, I don't think he has the slightest idea of how Mazabureinus' lifecycle will progress. Neither do I, for that matter, but I do have a strong hunch that the Queen may represent the closest thing the insect world has to intelligence. The colony should self-limit its production while you keep it in the crate but you should be certain to underfeed it (3lbs of cellulosic material MAX per day) until you have the means to expand its habitat in a contained manner; if it should lose its shackles, a pest of untold proportions will be unleashed and that will be on you.

Which reminds me, you should probably feed it and look for something sturdier to replace the styrofoam container with since they'll chew their way out of there once they get hungry. Sufficiently thick plastic should hold them for a few dozen generations.

Don't forget to call me!

PS. I hope you played Metroid!