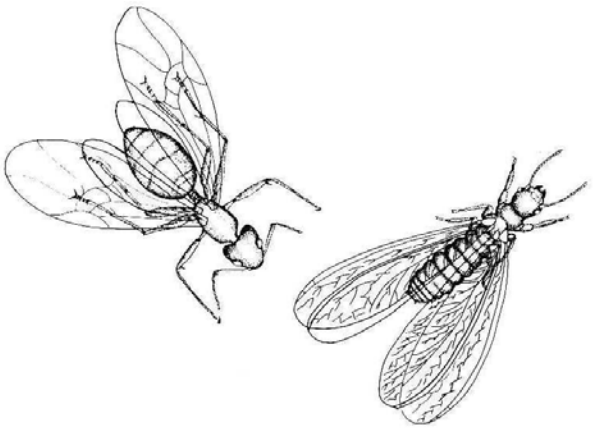

Bug-Wise

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Termites in Mississippi: We have three major species of termites in the state: eastern subterranean termites, Formosan termites, and southeastern drywood termites. All three species damage homes and other buildings, but their distribution varies. Eastern subterranean termites occur throughout the state. Formosan termites are spottily distributed in the southern half of the state, but continue to expand their territory each year. Southeastern drywood termites are uncommon, with most infestations occurring in the three coastal counties.

Eastern Subterranean Termites (*Reticulitermes flavipes*): These are our most common termites; they occur throughout Mississippi, and every wood structure in the state is at risk of attack by these termites. Actually there are several species of *Reticulitermes* termites in the state, but their biology and damage is so similar they can be considered as one for our purposes, and *R. flavipes* is by far the most common *Reticulitermes* species. These termites are a natural and important part of the ecosystem in southern forests, where they help recycle fallen trees and limbs. It is only when they enter our wooden buildings or damage other structures that these termites become pests. Unfortunately, this is something they will readily do. Eastern subterranean termites are very susceptible to desiccation and must maintain contact with the soil, or some other ready source of moisture, in order to survive. This is one of the weak links in termite biology that we exploit in their control.

Formosan Termites (*Coptotermes formosanus*): Formosan termites are a non-native, invasive species that was first found in the state in 1984. They now occur in at least 25 Mississippi counties (see map), and are especially common in the coastal area. This is a subterranean termite that, like eastern subterranean termites, nests in soil and forages on available wood. Well-established colonies of Formosan termites use a mixture of saliva, mud and digested wood to build nests, known as carton nests, in walls and other voids in infested buildings. In humid environments, this carton can absorb enough moisture from the air to sustain a colony. This ability to survive without having direct contact with soil is one of the key differences between Formosan and eastern subterranean termites. Formosan termites also larger, more aggressive in their foraging behavior, develop much larger colonies, and consume more wood per termite. This means that Formosans are capable of causing greater damage in a shorter period of time. Formosan termites are also much more likely to invade living trees, and will even attack trees, such as cypress, which are immune to eastern subterranean termites. Formosan termite infestations in trees are an important problem in the coastal area of the state.

Southeastern Drywood Termites (*Incisitermes snyderi*): Drywood termites occur primarily in the extreme southern part of the state, mostly along Highway 90. These termites get their name from the fact that they do not have to maintain contact with soil, or other source of moisture, in order to survive. They live in dry wood timbers. Drywood termite treatment is much different than that for other termites, so it is important to be sure of the identification before treating. Drywood termite swarmers superficially resemble Formosan termite swarmers and these two species are sometimes misidentified. Depending on the extent of infestation, treatment for dry wood termites can range from removing or treating a few infested timbers to tenting and fumigating the entire building. Occasionally other species of drywood termites are brought into the state in infested furniture or other wood products. Infestations of drywood termites are relatively uncommon, even in the coastal area, and the remainder of this article focuses on subterranean termites.

Termite Biology: Termites have a gradual life cycle, hatching from eggs, which are laid by the queen or by secondary reproductives, into nymphs. The nymphs gradually develop into adult termites, most of which are workers. There are several castes, but workers are by far the most numerous. Soldiers have enlarged, darker-colored heads armed with strong mandibles, which they use for protecting the colony. In addition to the founding queen and king, mature termite colonies also contain many secondary reproductives, and it is the combined egg production of these secondary reproductives that accounts for most colony growth. Mature colonies produced hundreds to thousands of winged swarmers once each year, which leave the colony and attempt to start new colonies of their own.

Termite colonies begin when a pair of swarmers settles to the ground after their mating flight, finds a crevice in the soil, seals themselves in, and mates. The young queen lays her first eggs, which hatch into nymphal workers. These first workers forage on cellulose material in the immediate area. This could be decaying bits of wood, mulch, leaves or pine needles. Recent research has found that pine needles are one of the best food sources for founding Formosan termite colonies. As more workers are produced, they expand the nest galleries and forage farther from the colony for food. New termite colonies grow slowly. After the first year a newly founded colony may only contain around 50 to 100 termites, and there may be only a few hundred after two years. It takes three to five years for a colony to grow large enough that it may be able to invade a building or produce swarmers of its own.

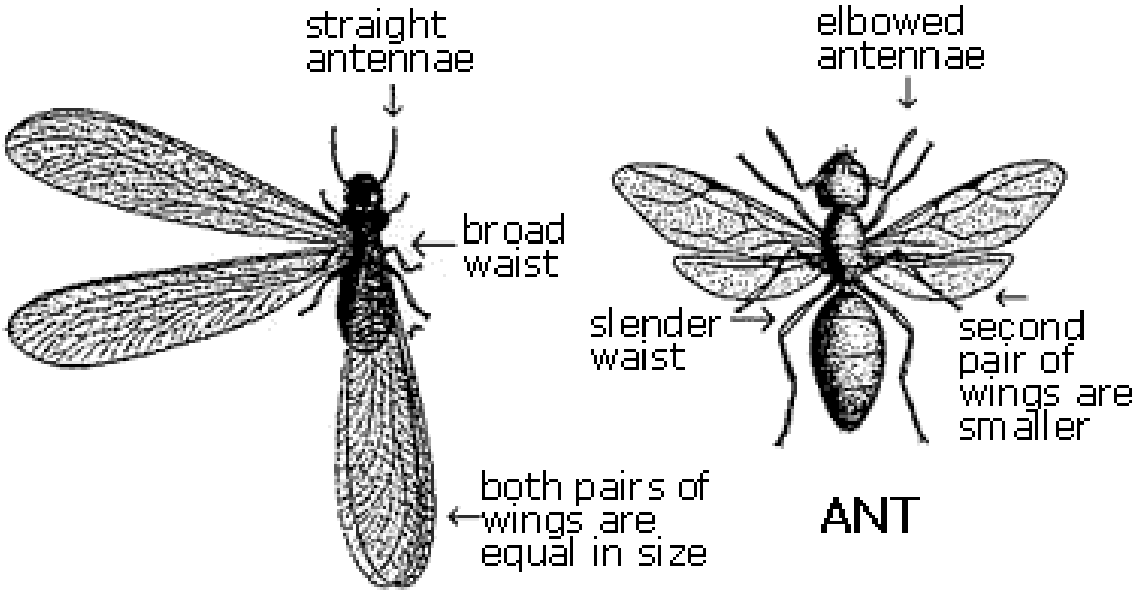
Termite workers are entirely white, soft-bodied, and blind. They are highly susceptible to desiccation and shun exposure to light and open air. This is why termites must maintain contact with moist soil, or some other constant source of moisture. Termites forage by building underground tunnels that radiate away from their nest site. They cannot sense the presence of wood or cellulose from any distance, and detect suitable food sources largely through random foraging. However, once they locate suitable food source they can exploit it for as long as it last. When the workers are forced to travel over an exposed hard surface, such as a rock, brick, treated wood, or a concrete foundation, they build mud tubes to maintain their moist, protected environment.

Swarming: Swarming is the primary means by which termites reproduce, spread, and begin new colonies. It takes several years for a colony to become large enough to produce swarmers. These winged 'swarmers' are unmated male and female reproductive forms. A healthy, well-established colony of subterranean termites will produce hundreds to thousands of swarmers.

Through most of the year a colony of termites goes about its daily business in out of the way, unseen places, tunneling through the soil and feeding on wood or other cellulose products. Normally, termites shun light and quickly plug any holes or openings to the outside world. However, on 'swarming day' the worker termites intentionally open holes to the outside and the young swarmers emerge in mass to fly and be carried by wind to another location. The plan is to pair up with a member of the opposite sex, fall to the ground together, shed the wings, mate, find a protected site in the ground, and begin a new colony. Unlike fire ants, which mate in the air, leaving the newly mated queen to start a new colony alone, newly paired termites found a colony together – queen and king. However, the vast majority of termite swarmers die without fulfilling this goal.

Eastern subterranean termites and Formosan termites swarm at different times of the year. Depending on location in the state, and other factors, most eastern subterranean termites will swarm from mid-February to mid-May, normally during the morning hours. Most swarming events occur over a short time frame and go unobserved. Seeing swarmers emerge inside a building, or finding dead swarmers on a windowsill is a sure sign a building is infested. Formosan termites usually swarm from early May to early June. Formosan termites swarm at night and are strongly attracted to lights. Occasionally, termite swarms are seen at other times of the year. These are usually one of the other species of *Reticulitermes* termites, but may be eastern subterranean termites.

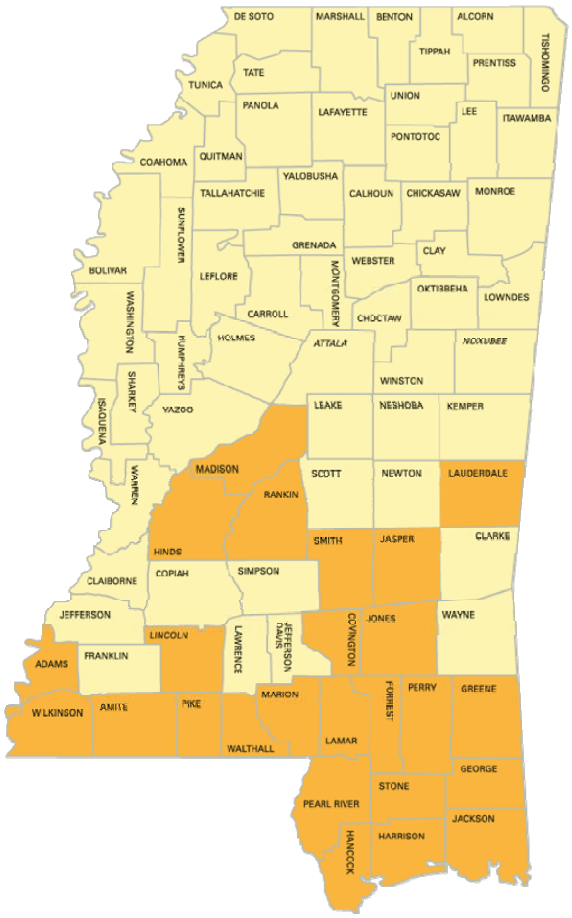
Termites or ants?: Although swarming termites may resemble winged ants superficially, a close examination reveals several major differences. Ants have elbowed antennae; a narrow, wasp-like waist; and hind wings that are shorter than the forewings. Termite swarmers have straight, bead-like antennae, a broad waist, and the hind wings and forewings are the same length.



Identifying Termite Species: Although they are the most abundant caste, workers of all three termite species are similar in appearance and are difficult, if not impossible, to identify. Fortunately, there are several differences in swarmers and soldiers, as well as in behavior, that allow for ready identification.

Trait or Habit	Termite Species		
	Eastern Subterranean	Formosan	Drywood
Distribution	Statewide	Southern half (see map)	Mostly along coast
Appearance of soldiers	Rectangular head No teeth on mandibles	Tear drop-shaped head No teeth on mandibles	Boxy, rectangular head Heavy teeth on mandibles
Abundance of soldiers	About 1 per 50 workers	About 1 per 10 workers	--
Color of Swarmers	Dark brown to black	Yellow to golden brown	Yellow to brown
Swarms (time of year)	Feb – May	May - June	May-June
Swarms (time of day)	Day, usually morning	Dusk to midnight	Dusk
Builds mud tubes	Yes	Yes	No
Produces dry fecal pellets	No	No	Yes
Dry soil in wood galleries	Yes	Yes	No
Forms aerial colonies (not requiring contact with soil)	Rarely (requires structural or plumbing leak to sustain an aerial colony)	Often (if a mature colony builds above ground carton nest, or if there are structural or plumbing leaks)	Always (does not require constant moisture source)

Distribution of Formosan Termites in Mississippi: As of 2008, established populations of Formosan termites were know to occur in 25 Mississippi counties, all of which are in the southern half of the state (see darker counties on map below). But, Formosan termites continue to spread within the state, and it is likely that undetected infestations already exist in many other counties. Within infested counties, populations are often spottily distributed. Some infested counties have only a few reported detections, but Formosan termites are quite common in the coastal area. Still, there are isolated areas or neighborhoods, even in the three coastal counties, that Formosan termites have not yet colonized.



Help Keep this Map Up To Date: If you encounter what you think are Formosan termites in a county where they have not been previously recorded, please try to send in a sample so we can document their spread. Just collect a few soldiers or swarmers, place in a leak-proof vial of alcohol or vinegar and mail to: Blake Layton, Box 9775, Mississippi State, MS. Be sure to include information on where they were collected and a brief description of the situation in which they were found, as well as your contact information.

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