# GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: ***Coptotermes formosanus***

***Coptotermes formosanus*** 简体中文 正體中文

**System:** Terrestrial

| Kingdom | Phylum | Class | Order | Family |
|---|---|---|---|---|
| Animalia | Arthropoda | Insecta | Isoptera | Rhinotermitidae |

**Common name** Formosa termite (German), Formosan subterranean termite (English)

**Synonym** *Coptotermes intrudens*

**Similar species**

**Summary** *Coptotermes formosanus* is a subterranean termite with an affinity for damp places. Wherever there is wood (cellulose) and moisture there is the possibility that this species can inhabit that location.

view this species on IUCN Red List

**Species Description**
It is difficult to identify Formosan termites with just the workers but the soldiers and alates look different from native subterranean species and are easy to identify. Cabrera *et al.* (2001) describes the soldiers as follows \"Soldiers have orange-brown, oval-shaped heads that are quite different from the more rectangular, straight-sided head of native subterranean termite soldiers. There is a small pore, called the fontanelle, on the front of the head. The soldiers produce droplets of a white, glue-like fluid from this pore when they are attacked. This fluid gums up and disables attackers. Soldiers have black, sickle-shaped mandibles (jaws) that can be crossed to form an X. The bodies are yellowish-white and are about 6.4mm long. Formosan subterranean termite soldiers are very aggressive. They will even attack fingers or tools if provoked, although their bite and fluid is harmless to humans. Swarmers are yellowish-brown with golden brown heads, a pair of black eyes and 2 pairs of wings of equal length. They are about 12-15mm long from head to wingtip. The wings are clear with two heavily thickened veins on the leading edge and are covered with small hairs. These hairs are clearly visible under magnification.\"
Please see PaDIL (Pests and Diseases Image Library) Species Content Page *Termites: Formosan subterranean termite* for high quality diagnostic and overview images.

**Notes**
Raloff (2003) reports that, \"It can take new colonies at least 7 years to reach a size that creates detectable damage. *C. formosanus* evaded detection for about 2 decades because they were mistaken for native termites of the *Reticulitermes* genus.\"

**Lifecycle Stages**
Su and Scheffrahn (2000) report that, \"A single colony of *C. formosanus* may produce over 70,000 alates. After a brief flight, alates shed their wings. Females immediately search for nesting sites with males following closely behind. When the pair find a moist crevice with wooden materials, they form the royal chamber and lay approximately 15 to 30 eggs. Within two to four weeks, young termites hatched from the eggs. The reproductives nurse the first group of young termites until they reach third instar. One to two months later, the queen lay the second batch eggs which would be eventually nursed by termites from the first egg batch. It may take three to five years before a colony reach substantial number to cause severe damage and produce alates.\"

**Habitat Description**
*C. formosanus* are subterranean and generally live underground. They build nests out of a hard material called carton, workers make carton from soil, chewed wood or plant matter, and their own saliva and faecal matter. Carton nests constructed by hundreds of thousands are large and rock-like. Some Formosan termite colonies build above-ground nests that are not connected to the soil. Nests may be constructed on structures where the temperature does not get too hot or cold and where there is plenty of moisture (Cabrera *et al.* 2001). Boats and ships; porches, balconies, rooftops with plants; gutters and flat roofs are some of the places where termites find moisture. Cabrera *et al.* (2001) has found that *C. formosanus* can take up residence in boats and even high-rise condominiums.
Raloff (2003) reports that, \"If *C. formosanus* find reliable food and drink, such as framing timber and rainwater, they will permanently nest within a building's walls.\" *C. formosanus* will also reside in live and dead trees along with homes and other man made structures (Raloff, 2003).

**Reproduction**
After swarming and landing on the ground, the alates break off their wings and search for a mate. Once a mate is found, the male and female search for a crevice in damp ground or wood, hollow out a small chamber, and crawl inside. The pair, now known as the king and queen, mate and within a few days the queen starts laying eggs. The young, known as larvae, hatch from the eggs and are fed by the king and queen. A mature colony contains distinct groups called. These castes look different from one another and each has a special duty within the colony. The king and queen *C. formosanus* are the primary reproductives and are responsible for reproduction. If the queen or king dies or the colony becomes large, secondary reproductives may form and begin reproduction. Soldiers defend the colony against predators and other natural enemies. Workers take care of and feed the larvae, reproductives and soldiers, tend the eggs, build and maintain the nest, and search for food. Alate nymphs become alates when they are fully grown. (Cabrera *et al.* 2001).

**Nutrition**
Cabrera *et al.* (2001) state that, \"Like many other termites, the Formosan termite feeds on wood and other materials that contain cellulose, such as paper and cardboard. Bacteria and other single-celled organisms live in the termite digestive system and digest cellulose providing nutrition and energy for these termites. Although they feed mostly on wood, they will eat other cellulose-containing materials such as cardboard and paper. However, they are known to chew through foam insulation boards, thin lead and copper sheeting, plaster, asphalt, and some plastics.\"
Morales-Ramos and Rojas, (2003) found that, \"Colonies of *C. formosanus* feeding on pecan, *Carya illinoensis* (Wangenh.), and red gum, *Liquidambar styraciflua* L., produced significantly more progeny than colonies feeding on other wood species tested. Progeny of colonies feeding on pecan and American ash, *Fraxinus americana* L., had significantly greater survival than progeny of colonies feeding on other wood species. Colonies feeding on nutritionally supplemented cellulose based matrix showed similar fitness characteristics as colonies feeding on the best wood treatments. These results indicate that differences observed in colony fitness can be partially explained by nutritional value of the food treatment, raising the possibility that wood from different tree species have different nutritional values to the Formosan subterranean termites. This suggests that feeding preference of *C. formosanus* is at least partially influenced by the nutritional value of the food source.\"

**General Impacts**
*C. formosanus* will hollow out live trees and not just dead ones. Some colonies will also nest in homes and other structures instead of just dining on them (Raloff, 2003). The presence of *C. formosanus* can easily go unnoticed for long periods of time. Infestations may not be noticed until floorboards become squishy or visible signs of the colony burrowing out through plaster walls become apparent (Raloff, 2003). Hu and Zhu (2003) found that in the wild *C. formosanus* cannot hybridise with other termite species. This species is very aggressive and will out compete native species of termites with ease.
*C. formosanus* has its greatest impact in North America. Lax and Osbrink (2003) state that, \"*C. formosanus* is currently one of the most destructive pests in the USA. It is estimated to cost consumers over US $1 billion annually for preventative and remedial treatment and to repair damage caused by this insect. \" Raloff (2003) states that in North America *C. formosanus*, \"create significantly bigger colonies, and therefore more damage, than do their native U.S. cousins, which reside underground and enter buildings only to forage.\"

**Management Info**
Please see Management Information *Coptotermes formosanus* for management information.

**Pathway**
Jenkins *et al.* (2002) state that *Coptotermes formosanus* spread through commercial traffic in used railroad cross ties.

**Principal source:** Cabrera *et al.* 2001. Formosan Subterranean Termite
Su and Scheffrahn, 2000. Formosan Subterranean Termite, *Coptotermes formosanus* Shiraki (Insecta: Isoptera: Rhinotermitidae)

**Compiler:** National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

**Review:** Dr. Nan-Yao Su, Ft. Lauderdale Research and Education Center, University of Florida.

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**ALIEN RANGE**

**[1]** GUAM
**[1]** SOUTH AFRICA
**[1]** TAIWAN
**[1]** UNITED STATES MINOR OUTLYING ISLANDS
**[3]** JAPAN
**[1]** SRI LANKA
**[61]** UNITED STATES

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