

First report of *Coptotermes gestroi* in Italy and Europe

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Abstract

The first finding of *Coptotermes gestroi* (Wasmann) (Isoptera Rhinotermitidae) in Italy and Europe is here reported. Termites were found on a yacht docked in a boatyard in Riposto (Catania, Sicily) for extraordinary repairs. Because *C. gestroi* and other *Coptotermes* species are known as serious pests, particular attention should be paid to the timely identification and treatment of their infestations, in order to avoid their settlement and spreading in Italy.

Key words: *Coptotermes gestroi*, new invasive species record, Italy.

Introduction

Termite presence on 50 meters-yacht docked in Riposto (Catania, Sicily) harbour for extraordinary repairs was brought to our attention by the boat's owners. The yacht had entered the Mediterranean Sea after having sailed the Caribbean Sea, and having visited, from 2007 to 2009, Panama, Bahamas, Barbados and Jamaica. Ship-board infestations are a common way of introduction of termites in distant areas (Scheffrahn and Su, 2005), so we thought that it would be necessary to identify the species involved, in order to determine whether it was one of the species already present in Italy or a species new to the Italian fauna.

In this work, we describe the characteristics of the boat's infestation, report the results of the identification of the species involved, and discuss the implications of what was found.

Materials and methods

Termites were sampled during an inspection and preserved in 100% ethanol until further analysis. The genus was identified using Buillon and Mathot (1965) key. For a reliable identification of the species, a 688-bp portion of the cytochrome oxidase subunit II gene and a 524-bp portion of the 16S ribosomal RNA gene were amplified and sequenced in two individuals, as in Ghesini *et al.* (2010). Closely related sequences were identified from GenBank using the BLAST network service (Altschul *et al.*, 1990).

Results and discussion

Termite-related damage was found in the dining room and in the bathroom of the yacht, in a plywood layer placed inside the walls, between a metal framework and a mahogany panelling. Termite survival and activity were probably favoured by the heat rising from the engine room located just below the dining room and by the humidity coming from a leaking tube of an air condi-

tioner installed in the wall. Both the mahogany paneling and the parquet flooring were undamaged.

Treatments for eradication of termites and measures for the disposal of infested wood were suggested, but, as far as we know, not carried out, so we cannot be sure that infested wood was disposed of correctly and not simply dumped on land.

During an inspection, a sample of termites was collected, that included some workers and four soldiers. A preliminary observation of workers and soldiers allowed us to exclude their belonging to either one of the European genera *Kaloterмес* and *Reticuliterмес*. By using a morphological key for soldiers (Bouillon and Mathot, 1965) we established their belonging to the family Rhinotermitidae and to the genus *Coptotermes*. Existing taxonomic keys of this genus do not allow reliable determinations at species level (Vargo and Husseneder, 2009). However, *Coptotermes gestroi* (Wasmann) is widespread in the area visited by the yacht and morphological features of the soldiers in our sample were compatible with those given for *C. gestroi* (Scheffrahn *et al.*, 1990; Scheffrahn and Su, 2008). In order to confirm the identification, we carried on the analysis using mitochondrial DNA markers. We chose 16S and COII genes because they have been sequenced in many *Coptotermes* species, so they granted a good probability of finding a match.

For both genes, the sequences were identical in the two individuals that were analyzed (GenBank accessions: HQ231233 and HQ231234). These sequences were found to correspond perfectly (100% identity) with sequences from *C. gestroi*. The 16S haplotype scored in the boat's sample is the same already found in *C. gestroi* specimens from Thailand, Malaysia, Indonesia, Singapore, Florida and Puerto Rico, while COII haplotype is the same already found in specimens from Florida.

C. gestroi, commonly known as the Asian subterranean termite, is natively distributed in the Indo-Malayan region and has been introduced by man in many regions outside its native range, including French Polynesia, Madagascar, Mauritius, Reunion, Caribbean Islands, Florida, Mexico, and Brazil (Jenkins *et al.*, 2007; Scheffrahn and Su, 2008 and references therein).

C. gestroi is an important pest of buildings and structures, both in its native range (Yeap *et al.*, 2007) and in regions where it was introduced by man (Costa-Leonardo and Arab, 2004; Jenkins *et al.*, 2007 and references therein). Shipboard infestations are believed to be the most likely means of *C. gestroi* introduction to new areas (Scheffrahn and Su, 2008).

C. gestroi is a tropical species, so its naturalisation in Italy seems unlikely, but its settlement could be possible in urban areas, where microclimatic conditions are warmer than in the surrounding areas. Some other species of the same genus are native of mild temperate regions, so they could adapt more easily to the Italian climate. This is the case of *Coptotermes formosanus* Shiraki, the most economically important *Coptotermes* species (Su and Scheffrahn, 2010), probably native of China, and spread by human activity to other regions, such as Taiwan, Japan, South Africa and the USA (Vargo *et al.*, 2003; Su and Scheffrahn, 2010).

To our knowledge, this is the second report of a species of the genus *Coptotermes* in Europe. The first report pertains to an infestation that was found in 2003 on a yacht moored in a boathouse in a naval dockyard in San Giovanni a Teduccio (Napoli) (Mancini and Priore, 2005). In that occasion, swarming alates were seen, and a subsequent inspection of the ship revealed a quite extensive infestation, that was treated with chlorpyrifos and then with methyl bromide. Termites were identified as belonging to the genus *Coptotermes*, but the species was not determined with certainty, even though it appeared similar to *Coptotermes intermedius* Silvestri (Mancini and Priore, 2005).

Considering that *Coptotermes* spp. termites are important pests of buildings and structures, particular attention should be paid to the timely detection of introduction events and to the identification of the species involved, in order to adopt suitable measures to ensure the eradication of the infestation, thus avoiding *Coptotermes* spp. settlement and spreading in Italy.

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