

## Reporting the northern limit of the distribution of Subterranean Termites *Coptotermes formosanus* Shiraki (Isoptera: Rhinotermitidae)

By

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### Abstract

Termites are insects which are sensitive to temperature change and their populations spread slowly. These characteristics suggest they can be an indicator insect for global warming. An intact colony of *Coptotermes* was detected June 27, 2013, in Suofang Villege (northern latitude 34°12'N, east longitude 118°53'E, altitude 6m), Guandun town, Shuyang City, Jiangsu Province. Samples were collected and reared indoors to obtain specimens for identification of the species. The field colony was also continuously monitored and alates collected from swarms that occurred in the same season for following 2~3 years. The final species was identified as *Coptotermes formosanus* by means of morphological characters and DNA barcoding. These observations have extended the known northern limit for the known distribution of this subterranean termite from the former northernmost collection at 33.5°N to 34°.12'N. As global warming intensifies, the northern limit distribution of *C. formosanus* should change as with other insects and more attention paid quarantine and control this pest. It was found that the critical climate factors that act on the distribution of *C. formosanus* were accumulated temperature, minimum temperature while precipitation had low impact on its distribution. Combined with analyzing the historic records, we concluded that the suitable regions for *C. formosanus* worldwide are located south of the line made up by Yibin, Chengdu, Chongqing, Sichuan Province, to Wuhan, Hubei Province, and to Shuyang, Jiangsu Province. The population of *C. formosanus* in Shuyang, Jiangsu Province should be included in the native geographical distribution of that species.

**Key words:** *Coptotermes formosanus*; North-distributing limitation; Global warming

### Results



Fig. 1 The northern line of *C. formosanus* distribution in China



Fig.2 The photos of soldier  
a. soldier; b. dorsal view of head; c. ventral view of head; d. mandibles (right, left); e. fontanelle;  
f. bristle of fontanelle; h. antenna; i. pronotum

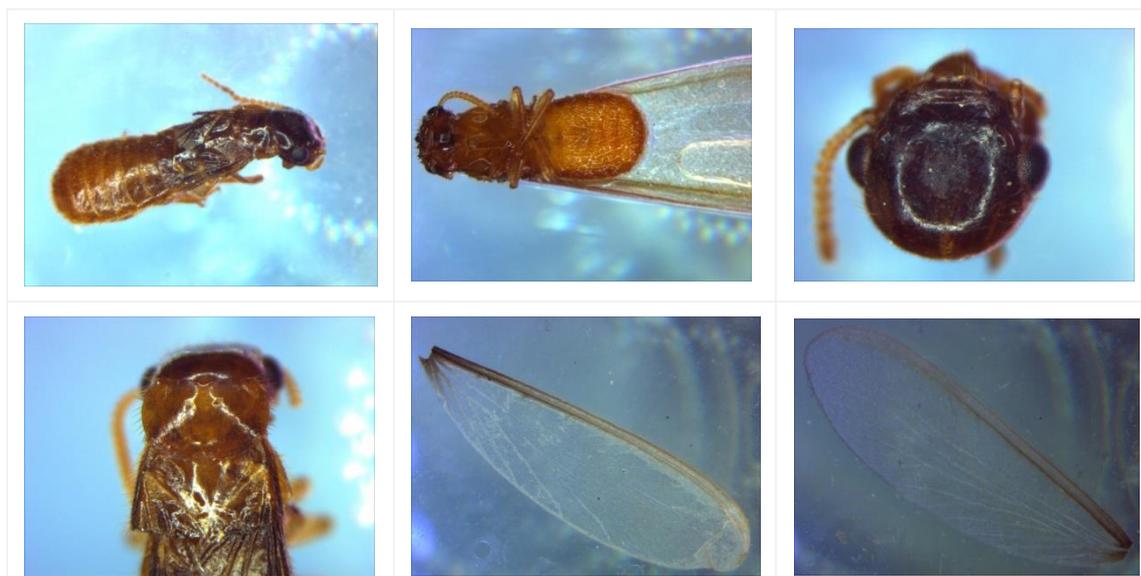


Fig. Photos of imago  
a. imago; b. ventral view of imago; c. dorsal view of head; d. pronotum; e. forewing; f. underwing

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