

Species of Termites (Isoptera) Attacking Trees in China

by

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ABSTRACT

The knowledge of trees damaged by termites in disturbed and natural areas of China is limited. Historically, termites are the most problematic pests threatening woody plants in China. They are abundant in tropical and subtropical environments and responsible for the loss of 40-60% of *Cunninghamia lanceolata* in southern hilly land. It has been estimated that termite damage in China results in approximately 1.8 billion RMB annually (equivalent to \$217 million US) economic loss. About 150 species of termites belonging to 4 families and 28 genera have been reported to infest plants. Correspondingly, 303 species of trees belonging to 76 families have been reported suffering from termite attack in China.

Key words: Termite damage, trees

INTRODUCTION

Termites living in colonies depend entirely on wood, either living or dead, or the woody tissue of plants, intact or partially decayed. They are important components of forest ecosystem, and are of great importance in recycling woody and other plant material. However, they become economic pests when they start destroying wood and wooden products of human homes, building materials, forests, and other commercial products (Verma *et al.* 2009).

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Historically, termites are the most problematic pests threatening woody plants in China. They are abundant in tropical and subtropical environments. Unfortunately, the major species of trees found in Chinese forests are *Pinus* spp., China fir (*Cunninghamia lanceolata*), tea-oil tree (*Camellia oleifera*), bamboo (*Phyllostachys pubescens*), poplars (*Populus* spp.), willows (*Salix* spp.), elm (*Ulmus pumila*), and locust trees (*Robinia pseudoacacia*) (Hsiao 1982). It was reported that the percent of China fir infested by termites reaches 40%~60% in the southern hilly land of China (Ke *et al.* 2008). Moreover, as rapid urbanization occurs in China, the attack of termites on landscapes and garden plants also become more and more serious. It has been estimated that termite damage in China results in approximately 1.8 billion RMB annually (equivalent to \$217 million US) economic loss (Gao *et al.* 1986).

Currently, about 2800 termite species are recognized and classified in seven families (Aanen *et al.* 2002). Over 470 termite species, belonging to Hodotermitidae, Kalotermitidae, Rhinotermitidae, and Termitidae families, have been documented in China and these termite species are distributed mainly in the southern area of Yangtse River (Huang *et al.* 2000). Of which, Yunnan province has the highest species, which has 125 species of termites known (Mo *et al.* 2008).

Species of Termites Attacking Trees in China

In the last few decades, much more attention has been paid to the termites attacking trees by Chinese researchers, and about 150 species of termites belonging to 4 families and 28 genera have been reported to infest trees (Table 1) (Chen & Zhang 1993, Lin *et al.* 1994, Jiang & You 1995). Among them, *Coptotermes formosanus*, *Reticulitermes flaviceps*, *R. chinensis*, *Odontotermes formosanus*, and *Macrotermes barneyi* are the species with serious damage to trees.

Species of Trees Damaged By Termites

In China, about 76 families and 303 species of trees have been reported to suffer from termite attack (Table 2). Among them, *Cunninghamia lanceolata*, *Cinnamomum camphora*, *Eucalyptus* spp., *Salix babylonica*, and *Platanus orientalis* are the species damaged seriously by termites (Wang 2007, Lin 2007). The damage caused by termites has been widely noticeable, especially in valuable old trees in recent years. In some areas, 51.26%~76.05% of old trees are being or have been damaged by termites (Zhong *et al.* 2005).

Table 1. Species of termites attacking trees in China

Family	Genera	Species			
Hodotermitidae	<i>Hodotermopsis</i> Holmgren	<i>H.shostedti</i> Holmgren			
Kalotermitidae	<i>Cryptotermes</i> Banks	<i>C. hainanensis</i> Ping	<i>C. declivis</i> Tsai et Chen		
	<i>Glyptotermes</i> Froggatt	<i>G. longnanensis</i> Gao et Zhu	<i>G. chinpingensis</i> Tsai et Chen		
		<i>G. fuscus</i> Oshima	<i>G. satsumensis</i> Matsumura		
		<i>G. resperus</i> Gao et al	<i>G. eurycaps</i> Gao et al		
		<i>G. curticeps</i> Fan et Xia	<i>G. guizhouensis</i> Ping et Xu		
		<i>G. succineus</i> Ping et Gong	<i>G. ficus</i> Ping et Xu		
	<i>Neotermes</i> Holmgren	<i>N. bruchynotum</i> Xu et Han	<i>N. humilis</i> Han		
		<i>N. koshunensis</i> Shiraki			
	Rhinotermitidae	<i>Prorhinotermes</i> Light	<i>P. hainanensis</i> Ping et Xu		
		<i>Schedorhinotermes</i> Silvestri	<i>S. magnus</i> Tsai et Chen		
<i>Coptotermes</i> Wasmann			<i>C.curvignathus</i> Holmgren	<i>C.(P.) formosanus</i> Shiraki	
			<i>C.(P.) longistratus</i> Li et Huang	<i>C.(P.) ochraceus</i> Ping et Xu	
			<i>C. communis</i> Xia et He	<i>C.(P.) suzhouensis</i> Xia et He	
			<i>C.(P.) guangzhouensis</i> Ping	<i>C.(P.) changtaiensis</i> Xia et He	
			<i>C.(P.) chaoxiannensis</i> Huang et Li	<i>C.(P.) jiaxingensis</i> Xia et He	
			<i>C.(P.) grandis</i> Li et Huang	<i>C.(P.) hainanensis</i> Li et Tsai	
			<i>C.ciaoliangensis</i> Ping	<i>C.rectangularis</i> Ping et Xu	
		<i>Reticulitermes</i>		<i>R.(P.) aculabialis</i> Tsai et Hwang	<i>R. labralis</i> Hsia et Fan
				<i>R.(P.) latilabris</i> Ping	<i>R.(P.) rectis</i> Xia et Fan
				<i>R.(P.) chinensis</i> Snyder	<i>R.(P.) hainanensis</i> Tsai et Hwang
			<i>R.(P.) leiboensis</i> Gao et Xia	<i>R.(P.) pseudaculabialis</i> Gao et Shi	
			<i>R.(P.) parvus</i> Li	<i>R.(F.) microcephalus</i> Zhu	
			<i>R.(F.) affinis</i> Hsia et Fan	<i>R.(F.) altus</i> Gao et Pen	
			<i>R.(F.) hypsofrons</i> Ping et Li	<i>R.(F.) flaviceps</i> Oshima	
			<i>R.(F.) fukienensis</i> Light	<i>R. flaviceps</i> Oshima	
			<i>R.(F.) castanus</i> Ping	<i>R.(P.) chryseus</i> Ping	
			<i>R. dinghuensis</i> Ping et al.	<i>R.(F.) guangzhouensis</i> Ping	
		<i>R.(F.) guilinensis</i> Li et Xiao	<i>R.(F.) guizhouensis</i> Ping et Xu		
	<i>R.(F.) gulinensis</i> Gao et Ma	<i>R.(F.) xingyiensis</i> Ping et Xu			

Table 1. Species of termites attacking trees in China (continued).

Family	Genera	Species
		<i>R. curvatus</i> Xia et Fan
		<i>R. (P.) dabieshanensis</i> Wang et Li
		<i>R. (F.) longipennis</i> Wang et Li
		<i>R. (F.) fulvimaginalis</i> Wang et Li
		<i>R. (F.) pingjiangensis</i> Tsai et Ping
		<i>R. (F.) dantuensis</i> Gao et Zhu
		<i>R. (F.) speratus</i> Kolbe
		<i>R. (P.) leptomandibularis</i> Hsia et Fan
		<i>R. (P.) leptogulus</i> Ping et Xu
		<i>R. perilabralis</i> Ping et Xu
		<i>R. (P.) perilucifugus</i> Ping
		<i>R. (P.) pseudaculabialis</i> Tao et Shi
		<i>R. (P.) hubeiensis</i> Ping et Huang
		<i>R. (P.) humanensis</i> Tsai et Peng
		<i>R. (P.) conus</i> Xia et Fan
		<i>R. (F.) wugongensis</i> Li et Huang
		<i>R. (F.) bitumulus</i> Ping et Xu
		<i>R. (F.) huapingensis</i> Li
		<i>R. setosus</i> Li et Xiao
		<i>R. (P.) sablongipitatus</i> Ping
		<i>R. testudineus</i> LI et Ping
		<i>R. tricolorus</i> Ping
		<i>R. (F.) yizhangensis</i> Huang et Tong
	<i>Heterotermes</i>	<i>H. gaoyaoensis</i> Tsai et Li
		<i>H. solidimandibulas</i> Li et Xiao
	<i>Tsaitermes</i>	<i>T. yingdeensis</i> Tsai et Li
		<i>T. amplexus</i> Wang et Xu
		<i>T. ocephalus</i> Ping et Li
		<i>T. humanensis</i> Li et Ping
	<i>Stylotermes</i>	<i>S. latilabrum</i> Tsai et chen
		<i>S. mecocephalus</i> Ping et Li
		<i>S. setosua</i> Li et Ping
		<i>S. sinensis</i> Yu et Ping
		<i>S. undulatus</i> Ping et Li
		<i>S. valvules</i> Tsao et Ping
		<i>S. robrstus</i> Ping et Li
Termitidae	<i>Microcotermes</i>	<i>M. marilimbus</i> Ping et Xu
	<i>Globitermes</i>	<i>M. remotus</i> Ping et Xu
	<i>Capritermes</i>	<i>C. nitobei</i> Shiraki
	<i>Eubamitermes</i>	<i>E. yunnanensis</i> Ping et Xu
		<i>E. quadriceps</i> Ping et Li
	<i>Micratermes</i>	<i>M. dimorphus</i> Tsai et Chen
	<i>Odontotermes</i>	<i>O. Pujiangensis</i> Fan
		<i>O. angustignathus</i> Tsai et Chen
	Holmgren	<i>O. assamensis</i> Holmgren
		<i>O. fontanellus</i> Kemner
		<i>O. formosanus</i> Shiraki
		<i>O. fuyangensis</i> Gao et Zhu
		<i>O. graveyi</i> Silvestri
		<i>O. hainanensis</i> Light
		<i>O. yunnanensis</i> Tsai et Chen
		<i>O. zunyiensis</i> Li et Ping
		<i>O. qiatyangensis</i> Li
	<i>Hypotermes</i>	<i>H. sumatrensis</i> Holmgren
	Holmgren	
	<i>Macrotermes</i>	<i>M. annandalei</i> Silvestri
		<i>M. barneyi</i> Light
	Holmgren	<i>M. denticulatus</i> Li et Ping
		<i>M. guangxiensis</i> Han
		<i>M. longiceps</i> Li et Ping
		<i>M. planicapitatus</i> Gao et Lau
		<i>M. trimorphus</i> Li et Ping
		<i>M. hainanensis</i> Li et Ping
		<i>M. nanningensis</i> Hen
		<i>M. orthognathus</i> Ping et Xu
		<i>M. trapezoides</i> Ping et Xu

Table 1. Species of termites attacking trees in China (continued).

Family	Genera	Species
	<i>Ancistrotermes</i>	
	Silvestri	<i>A. dimorphus</i> Tsai et Chen
	<i>Malaysiocapritermes</i>	
	Ahmad et Akhtar	<i>M. huananensis</i> Yu et Ping
	<i>Sinocapritermes</i>	
	Ping et Xu	<i>S. sinensis</i> Ping et Xu <i>S. mushae</i> Oshima et Maki
		<i>S. fujianensis</i> Ping et Xu <i>S. guangxiensis</i> Ping et Xu
	<i>Pericapritermes</i>	
	Silvestri	<i>P. nitobei</i> Shiraki <i>P. jangtsekingensis</i> Kemner
		<i>Ptetraogukys</i> Silvestri
	<i>Cucurbitermes</i>	<i>C. sinensis</i>
	<i>Havilanditermes</i>	<i>H. orthonasus</i> Tsai et Chen
	<i>Nasutitermes</i>	<i>N. parvonasutus</i> Shirali <i>N. grandinasus</i> Tsal et Chen
		<i>N. inclinatus</i> Ping et Xu <i>N. mirabilis</i> Ping et Xu
		<i>N. takasagoensis</i> Shirak <i>N. sinensis</i> Gao et Tian
		<i>N. planiusculus</i> Ping et Xu <i>N. platycephalus</i> Ping et Xu
	<i>Sinonasutitermes</i>	<i>S. platycephalus</i> Ping et Xu <i>S. erectinasus</i> Tsai et Chen
	Li	<i>S. guangxleasls</i> Ping et Huang
	<i>Mironasutitermes</i>	<i>M. longwanshanensis</i> Gao <i>M. bashanensis</i> Zhang et Huang
		<i>M. qimenesi</i> Gao et Chen <i>M. huangshanensis</i> Gao et Chen
	<i>Ahmaditermes</i>	<i>A. sinuosus</i> Tsai et Chen <i>A. perlshuosus</i> Li et Xiao
	Akhtar	<i>A. xiangyunensis</i> Gao et Cong <i>A. gttizhouensis</i> Li et Ping

Table 2. Species of trees damaged by termites

Family	Genera	Species
Ginkgoaceae	<i>Ginkgo</i> Linn.	<i>G. biloba</i> Linn.
Araucariaceae	<i>Araucaria</i> Juss.	<i>A. cunninghamii</i> Sweet
Pinaceae	<i>Keteleeria</i> Carr.	<i>K. fortunei</i> (Murr.) Carr.
	<i>Abies</i> Mill.	<i>A. firma</i> Sieb. et Zucc.
	<i>Pseudolarix</i> Gord.	<i>P. kaempferi</i> (Lindl.) Gord.
	<i>Cedrus</i> Trew	<i>C. deodara</i> (Roxb.) G.. Don
	<i>Cathaya</i> Chun et Kuang	<i>C. argyrophylla</i> Chun et Kuang
	<i>Pinus</i> Linn.	<i>P. caribaea</i> Morelet. <i>P. elliottii</i> Engelm.
		<i>P. massoniana</i> Lamb. <i>P. thunbergii</i> Parl.
	<i>P. taeda</i> Linn. <i>P. merkusii</i>	
	<i>P. densiflora</i> Sieb. et Zucc. <i>P. kwangtungensis</i> Chun ex Tsiang	
	<i>P. kwangtungensis</i> Chun ex Tsiang <i>P. yunnanensis</i> Franch.	
Taxodiaceae	<i>Sequoia</i> Endl.	<i>S. sempervirens</i> (Lamb.) Endl.

Table 2. Species of trees damaged by termites (continued).

Family	Genera	Species
	<i>Cunninghamia</i> R. Br.	<i>C. lanceolata</i> (Lamb.) Hook.
	<i>Cryptomeria</i> D. Don	<i>C. fortunei</i> Hooibrenk ex Otto et
	<i>Metasequoia</i> Miki ex Hu et Cheng	<i>M. glyptostrodoides</i> Hu et Cheng
Cupressaceae	<i>Taxodium</i> Rich.	<i>T. ascendens</i> Brongn <i>T. distichum</i> (Linn.) Rich.
	<i>Platycladus</i> Spach	<i>P. orientalis</i> CV. Sieboldii
	<i>Cupressus</i> Linn.	<i>C. funebris</i> Endl.
	<i>Chamaecyparis</i> Spach	<i>C. obtuse</i> CV. Breviramea
	<i>Fokienia</i> Henry et Thomas	<i>F. hodginsii</i> (Dunn) Henry et Thomas
	<i>Sabina</i> Mill.	<i>S. procumbens</i> (Siebold ex Endl.) Miq. <i>S. chinensis</i> L.
	<i>Juniperus</i> Linn.	<i>J. formosana</i> Hayata
Podocarpaceae	<i>Podocarpus</i> L'Her. ex Persoon	<i>P. macrophyllus</i> (Thunb.) D. Don
Cephalotaxaceae	<i>Cephalotaxus</i> Sieb. et Zucc. ex Endl.	<i>C. fortunei</i> Hook. f.
Taxaceae	<i>Taxus</i> linn.	<i>T. chinensis</i> (Pilg.) Florin <i>T. chinensis</i> var. <i>mairei</i>
	<i>Torreya</i> Am.	<i>T. grandis</i> Fort. ex Lindl.
Magnoliaceae	<i>Manglietia</i> Bl.	<i>M. fordiana</i> Oliv.
	<i>Magnolia</i> Linn.	<i>M. denudate</i> Desr. <i>M. officinalis</i> Rehd. et Wils. <i>M. liliflora</i> Desr. <i>M. grandiflora</i> Linn. <i>M. biloba</i> (Rehd. et Wils.) Cheng
	<i>Tsoongiodendron</i> Chun	<i>T. odorum</i> Chun
	<i>Michelia</i> Linn.	<i>M. maudiae</i> Dunn <i>M. figo</i> (Lour.) Spreng.
	<i>Liriodendron</i> Linn.	<i>L. chinense</i> (Hemsl.) Sarg.
Lauraceae	<i>Illincium</i> Linn.	<i>I. verum</i> Hook. f.
	<i>Sassafras</i> Trew	<i>S. tzumu</i> (Hemsl.) Hemsl.
	<i>Cinnamomum</i> Trew.	<i>C. camphora</i> (Linn.) Presl <i>C. japonicum</i> Sieb. <i>C. (Nees) BL.</i>
	<i>Machilus</i> Nees	<i>M. thunbergii</i> Sieb. et Zucc. <i>M. chinensis</i> (Champ. ex Benth.) Hemsl.
	<i>Litsea</i> Lam.	<i>L. coreana</i> Lévl.
	<i>Lindera</i> Thunb.	<i>L. communis</i> Hemsl. <i>L. megaphylla</i> Hemsl.
Rosaceae	<i>Spiraea</i> Linn.	<i>S. hunbergii</i> Sieb. ex Blume <i>S. cantoniensis</i> Lour.
	<i>Pyracantha</i> Roem.	<i>P. fortuneana</i> (Maxim.) Li
	<i>Photinia</i> Lindl.	<i>P. serrulata</i> Lindl.
	<i>Eriobotrya</i> Lindl.	<i>E. japonica</i> (Thunb.) Lindl.
	<i>Pyrus</i> Linn.	<i>P. serrulata</i> Rehd.

Table 2. Species of trees damaged by termites (continued).

Family	Genera	Species
	<i>Malus</i> Mill.	<i>M. spectabilis</i> (Ait.) Borkh.
	<i>Rosa</i> Linn.	<i>R. chinensis</i> Jacq.
	<i>Prunus</i> Linn.	<i>P. persica</i> var. <i>densa</i> <i>P. salicina</i> Lindl. <i>P. pseudocerasus</i> Lindl.
		<i>P. persica</i> Linn. <i>P. cerasifera</i> Ehrhart <i>P. subhirtella</i> Miq.
Calycanthaceae	<i>Chimonanthus</i> Lindl.	<i>C. praecox</i> (Linn.) Link
	<i>Calycanthus</i> Linn.	<i>S. chinensis</i> Cheng et S. Y.
Leguminosae	<i>Delonix</i> Raf.	<i>D. regia</i> (Boj.) Raf.
	<i>Gleditsia</i> Linn.	<i>G. sinensis</i> Lam.
	<i>Cercis</i> Linn.	<i>C. chinensis</i> Bunge
	<i>Cassia</i> Linn.	<i>C. surattensis</i> Burm. f.
	<i>Bauhinia</i> Linn.	<i>B. purpurea</i> Linn. <i>B. blakeana</i> Dunn
	<i>Hymenaea</i> Linn.	<i>H. courbaril</i> Linn.
	<i>Acacia</i> Mill.	<i>A. mearnsii</i> De Wilde
	<i>Albizia</i> Durazz.	<i>A. julibrissin</i> Durazz. <i>A. chinensis</i> (Osbeck) Merr.
	<i>Pithecellobium</i> Mart.	<i>P. dulce</i> (Roxb.) Benth.
	<i>Ormosia</i> G. Jacks.	<i>O. hosiei</i> Hemsl. et Wils.
	<i>Sophora</i> Linn.	<i>S. japonica</i> Linn.
	<i>Robinia</i> Linn.	<i>R. pseudoacacia</i> Linn.
	<i>Wisteria</i> Nutt.	<i>W. sinensis</i> Sweet.
Papilionaceae	<i>Dalbergia</i> Linn. f.	<i>D. balansae</i> Prain
	<i>Amorpha</i> Linn.	<i>A. fruticosa</i> Linn.
	<i>Erythrina</i> Linn.	<i>E. indica</i> Lam
Styracaceae	<i>Styrax</i> Linn.	<i>S. japonica</i> Sieb
Combretaceae	<i>Terminalia</i> Linn.	<i>T. catappa</i> Linn.
Daphniphyllaceae	<i>Daphniphyllum</i> Bl.	<i>D. macropodium</i> Miq.
Nyssaceae	<i>Camptotheca</i> Decne.	<i>C. acuminata</i> Decne.
	<i>Nyssa</i> Gronov. ex Linn.	<i>N. sinensis</i> Oliv.
	<i>Davidia</i> Baill.	<i>D. involucrata</i> Baill.
Cucurbitaceae	<i>Siraitia</i>	<i>S. grosvenorii</i> (Swingle) C. Jeffrey ex A. M. Lu et Z. Y. Zhang
Tiliaceae	<i>Excentrodendron</i> H.T. Chang	<i>E. hsienmu</i> (A. Chev.) H. T. Chang et R. H. Miau
	<i>Tilia</i> Linn.	<i>T. tuan</i> Szyszyl.
Capparidaceae	<i>Crateva</i> Linn.	<i>C. religiosa</i> Forst.
Proteaceae	<i>Grevillea</i> R. Br.	<i>G. robusta</i> A. Cunn. ex R. Br.
Casuarinaceae	<i>Casuarina</i> Adans.	<i>C. equisetifolia</i> Forst.

Table 2. Species of trees damaged by termites (continued).

Family	Genera	Species
Ebenaceae	<i>Diospyros</i> Linn.	<i>D. kaki</i> Thunb.
Myricaceae	<i>Myrica</i> Linn.	<i>M. rubra</i> (Lour.) Sieb. et Zucc.
Scrophulariaceae	<i>Paulownia</i> Sieb. et. Zucc.	<i>P. fortunei</i> (Seem.) Hemsl. <i>P. elongata</i> S.Y. Hu
Verbenaceae	<i>Tectona</i> Linn. f. <i>Vitex</i> Linn.	<i>T. grandis</i> Linn. f. <i>V. negundo</i> Linn.
Platanaceae	<i>Platanus</i> Linn.	<i>P. hispanica</i> Muenchh. <i>P. occidentalis</i> Linn. <i>P. orientalis</i> Linn.
Sterculiaceae	<i>Firmiana</i> Marsili <i>Sterculia</i> <i>Heritiera</i>	<i>F. platanifolia</i> (Linn.f.) Marsili <i>S. lanceolata</i> Cav. <i>H. littoralis</i> Dryand.
Elaeocarpaceae	<i>Elaeocarpus</i> Linn.	<i>E. decipiens</i> Hemsl. <i>E. hainanensis</i> Oliver
Bignoniaceae	<i>Catalpa</i> Scop. <i>Jacaranda</i> Juss. <i>Oroxylum</i> Vent.	<i>C. speciosa</i> Dryand. <i>C. bungei</i> C. A. Mey. <i>J. mimosifolia</i> D. Don <i>O. indicum</i> (Linn.) Kurz
Hippocastanaceae	<i>Aesculus</i> Linn.	<i>A. chinensis</i> Bunge
Lythraceae	<i>Lagerstroemia</i> Linn.	<i>L. indica</i> Linn. <i>L. fordii</i> Oliv. et Koehne
Simaroubaceae	<i>Ailanthus</i> Desf.	<i>A. altissima</i> (Mill.) Swingle
Malvaceae	<i>Hibiscus</i> Linn.	<i>H. syriacus</i> Linn. <i>H. mutabilis</i> Linn.
Ranunculaceae	<i>Paeonia</i> Linn.	<i>P. suffruticosa</i> Andr.
Berberidaceae	<i>Nandina</i> Thunb.	<i>N. domestica</i> Thunb.
Cornaceae	<i>Bothrocaryum</i> (Koehne) Pojark.	<i>Cornus controversa</i> Hemsl.
Caprifoliaceae	<i>Viburnum</i> Linn.	<i>V. opulus</i> var. <i>calvescens</i> <i>V. odoratissimum</i> Ker-Gawl.
Eucommiaceae	<i>Eucommia</i> Oliver	<i>E. ulmoides</i> Oliver
Thymelaeaceae	<i>Edgeworthia</i> Miessn.	<i>E. chrysantha</i> Lindl.
Tamaricaceae	<i>Tamarix</i> Linn.	<i>T. chinensis</i> Lour.
Ericaceae	<i>Rhododendron</i> Linn.	<i>R. simsii</i> Planch.
Aquifoliaceae	<i>Ilex</i> Linn.	<i>I. cornuta</i> Lindl. <i>I. chinensis</i> Sims
Behulaceae	<i>Alnus</i> Mill.	<i>A. cremastogyne</i> Burk.
Rhamnaceae	<i>Hovenia</i> Thunb. <i>Ziziphus</i> Mill. <i>Paliurus</i> Tourn. ex Mill.	<i>H. acerba</i> Lindl. <i>Z. jujube</i> Dates. <i>P. ramosissimus</i> (Lour.) Poir.
Anacardiaceae	<i>Toxicodendron</i> (Tourn.) Mill. <i>Pistacia</i> Linn. <i>Dracontomelon</i> Bl.	<i>T. succedaneum</i> (Linn.) <i>P. chinensis</i> Bunge <i>D. duperreanum</i> Pierre

Table 2. Species of trees damaged by termites (continued).

Family	Genera	Species	
	<i>Rhus</i> (Tourn.) Linn. emend. Moench	<i>R. chinensis</i> Mill.	
	<i>Spondias</i> Linn.	<i>S. lakonensis</i> Pierre	
	<i>Anacardium</i> (Linn.) Rottboell	<i>A. occidentale</i> Linn.	
Salicaceae	<i>Populus</i> Linn.	<i>P. tomentosa</i> Carr.	
	<i>Salix</i> Linn.	<i>S. chaenomeloides</i> Kimura	<i>S. babylonica</i> Linn.
Euphorbiaceae	<i>Vernicia</i> Lour.	<i>V. fordii</i> Hemsl. <i>V. montana</i> (Lour.) Wils.	<i>V. montana</i> Lour.
	<i>Aleurites</i> J.R. <i>et</i> G. Forst.	<i>A. moluccana</i> (Linn.) Willd.	
	<i>Endospermum</i> Benth.	<i>E. chinense</i> Benth.	
	<i>Manihot</i> Mill.	<i>M. esculenta</i> Crantz.	
	<i>Hevea</i> Aubl.	<i>H. brasiliensis</i> (H.B.K.) Muell. <i>et</i> Arg.	
	<i>Sapium</i> P. Br.	<i>S. sebiferum</i> Linn. Roxb.	
	<i>Mallotus</i> Lour.	<i>M. tenuifolius</i> Pax	
	<i>Bischofia</i> Bl.	<i>B. javanica</i> Bl.	
	<i>Glochidion</i> J.R. <i>et</i> G. Forst.	<i>G. wrightii</i> Benth.	
	<i>Mallotus</i> Lour.	<i>M. tenuifolius</i> Pax	
Juglandaceae	<i>Carya</i> Nutt.	<i>C. cathayensis</i> Sarg.	<i>C. illinoensis</i> (Wangenh.) K. Koch
	<i>Platycarya</i> Sieb. <i>et</i> Zucc.	<i>P. strobilacea</i> Sieb. <i>et</i> Zucc.	
	<i>Pterocarya</i> Kunth.	<i>P. stenoptera</i> C. DC.	
Oleaceae	<i>Osmantbus</i> Lour.	<i>O. fragrans</i> Lour.	
	<i>Ligustrum</i> Linn.	<i>L. lucidum</i> Ait.	<i>L. sinense</i> Lour.
	<i>Syringa</i> Linn.	<i>S. vulgaris</i> Linn.	
	<i>Olea</i> Linn.	<i>O. europaea</i> Linn.	
	<i>Fraxinus</i> Linn.	<i>F. chinensis</i> Roxb.	
Meliaceae	<i>Toona</i> Roem	<i>T. sinensis</i> (A.Juss.) Roem.	
	<i>Melia</i> Linn.	<i>M. azedarach</i> Linn.	
Hamamelidaceae	<i>Mytilaria</i> Lec.	<i>M. laosensis</i> Lec.	
	<i>Liquidambar</i> Linn.	<i>L. formosana</i> Hance	
	<i>Distylium</i> Sieb. <i>et</i> Zucc.	<i>D. racemosum</i> Sieb. <i>et</i> Zucc.	
	<i>Loropetalum</i> R. Brown	<i>L. chinense</i> var. <i>rubrum</i>	
Bombacaceae	<i>Bombax</i> Linn.	<i>B. malabaricum</i> DC.	
	<i>Ceiba</i> Mill.	<i>C. pentandra</i> (Linn.) Gaertn.	
Apocynaceae	<i>Nerium</i> Linn.	<i>N. indicum</i> Mill.	
	<i>Plumeria</i> Linn.	<i>P. rubra</i> Linn.	
Rubiaceae	<i>Gardenia</i> Ellis	<i>G. jasminoides</i> Ellis	
Aceraceae	<i>Acer</i> Linn.	<i>A. japonicum</i> Thunb.	<i>A. davidii</i> Franch.

Table 2. Species of trees damaged by termites (continued).

Family	Genera	Species	Species
		<i>A. pubipalmatum</i> Fang	<i>A. palmatum</i> Thunb.
Sabiaceae	<i>Meliosma</i> Bl.	<i>A. buergerianum</i> Miq.	
		<i>M. cuneifolia</i> Franch.	<i>M. angustifolia</i> Merr.
Fagaceae	<i>Quercus</i> Linn.	<i>Q. griffithii</i> Hook.f. et Thoms.	<i>Q. acutissima</i> Carruth.
	<i>Cyclobalanopsis</i> Oerst.	<i>C. myrsinaefolia</i> Oerst.	
	<i>Castanopsis</i> Spach	<i>C. carlesii</i> (Hemsl.) Hayata	<i>C. fissa</i> (Champ. ex Benth.) Rehd. et Wils.
		<i>C. sclerophylla</i> (Lindl.) Schott.	<i>C. eyrei</i> (Champ.) Tutch.
			<i>C. chinensis</i> Hance
Sapotaceae	<i>Castanea</i> Mill.	<i>C. mollissima</i> Bl.	
Theaceae	<i>Manilkara</i> Adans.	<i>M. zapota</i> (Linn.) van Royen	
	<i>Schima</i> Reinw.	<i>S. superba</i> Gardn. et Champ.	
	<i>Adinandra</i> Jack	<i>A. millettii</i> . (Hook. et Arn.) Benth. et Hook. f. ex Hance	
	<i>Camellia</i> Linn.	<i>C. oleifera</i> Abel.	<i>C. japonica</i> Linn.
		<i>C. sinensis</i> O. Ktze.	
Moraceae	<i>Artocarpus</i> J. R. et G. Forst.	<i>A. heterophyllus</i> Lam.	
	<i>Morus</i> Linn.	<i>M. alba</i> Linn.	
	<i>Broussonetia</i> L'Hér. ex Vent.	<i>B. papyrifera</i> (Linn.) L'Hér. ex Vent.	
	<i>Ficus</i> Linn.	<i>F. microcarpa</i> Linn. f.	
		<i>F. benjamina</i> Linn.	<i>F. altissima</i> Bl.
		<i>F. virens</i> var. <i>sublanceolata</i>	<i>F. hispida</i> Linn. f.
Myrtaceae	<i>Cudrania</i> Tréc.	<i>C. tricuspidata</i> (Carr.) Bur.	
	<i>Eucalyptus</i> L'Herit.	<i>E. grandis</i> Hill ex Maiden	<i>E. robusta</i> Smith
		<i>E. rudis</i> Endl.	<i>E. tereticornis</i> Smith
		<i>E. exserta</i> F.V. Mull.	<i>E. citriodora</i> Hook. f.
		<i>E. saligna</i> Smith	
	<i>Psidium</i> Linn.	<i>P. guajava</i> Linn.	
	<i>Melaleuca</i> Linn.	<i>M. leucadendra</i> Linn.	
	<i>Callistemon</i> R. Brown	<i>C. rigidus</i> R. Brown	
	<i>Rhodomyrtus</i> (DC.) Reich.	<i>R. tomentosa</i> (Ait.) Hassk.	
	<i>Syzygium</i> Gaertn.	<i>S. jambos</i> (Linn.) Alston	<i>S. buxifolium</i> Hook. et Arn.
		<i>S. yunnanense</i> Merr. et Perry	
Araliaceae	<i>Lophostemon</i> Schott	<i>L. conferta</i> (R.Br.)	
	<i>Kalopanax</i> Miq.	<i>K. septemlobus</i> (Thunb.) Koidz.	
	<i>Schefflera</i> J.R. et G. Forst.	<i>S. octophylla</i> (Lour.) Harms	
Sapindaceae	<i>Litchi</i> Sonn.	<i>L. chinensis</i> Sonn.	
	<i>Dimocarpus</i> Lour.	<i>D. longan</i> Lour.	
	<i>Sapindus</i> Linn.	<i>S. mulorossi</i> Gaertn.	
	<i>Koelreuteria</i> Laxm.	<i>K. integrifoliola</i> (Merr.) T. Chen	

Table 2. Species of trees damaged by termites (continued).

Family	Genera	Species	
Celastraceae	<i>Euonymus</i> Linn.	<i>E. alatus</i> (Thunb.) Sieb.	<i>E. japonicus</i> Linn.
Rutaceae	<i>Citrus</i> Linn.	<i>C. reticulata</i> Blanco	<i>C. grandis</i> (Linn.) Osbeck
		<i>C. sinensis</i> (Linn.) Osbeck	
		<i>C. lansium</i> (Lour.) Skeels	
Ulmaceae	<i>Ulmus</i> Linn.	<i>E. leptota</i> (Spreng.) Merr.	<i>U. pumila</i> Linn.
		<i>U. parvifolia</i> Jacq.	<i>U. gaussonii</i> Cheng
		<i>U. chenmouii</i> Cheng	
Palmae	<i>Zelkova</i> Spach	<i>Z. schneideriana</i> Hand.-Mazz.	
	<i>Pteroceltis</i> Maxim.	<i>P. tatarinowii</i> Maxim.	
	<i>Celtis</i> Linn.	<i>C. julianae</i> Schneid.	<i>C. sinensis</i> Pers.
	<i>Caryota</i> Linn.	<i>C. ochlandra</i> Hance	
	<i>Chrysalidocarpus</i> H. Wendl.	<i>C. lutescens</i> H. Wendl.	
	<i>Roystonea</i> O. F. Cook	<i>R. regia</i> (Kunth) O. F. Cook	
	<i>Trachycarpus</i> H. Wendl.	<i>T. fortunei</i> (Hook.) H. Wendl.	
	<i>Livistona</i> R. Br.	<i>L. chinensis</i> (Jacq.) R. Br.	
	<i>Cocos</i> Linn.	<i>C. nucifera</i> Linn.	
	<i>Elaeis</i> Jacq.	<i>E. guineensis</i> Jacq.	
Gramineae	<i>Phoenix</i> Linn.	<i>P. dactylifera</i> Linn.	
	<i>Phyllostachys</i> Sieb. <i>et</i> Zucc.	<i>P. glauca</i> McClure	
		<i>P. edulis</i> (Carrière) J. Houz.	<i>P. praecox</i> Chu <i>et</i> Chao
	<i>Bambusa</i> Retz. corr. Schreber	<i>Bambusa oldhamii</i> Munro	
	<i>Dipterocarpus</i> Gaertn. f.	<i>D. retusus</i> Blume	
Bursaceae	<i>Shorea</i> Roxb.	<i>S. robusta</i> C. F. Gaertn.	<i>S. assamica</i> Dyer
	<i>Canarium</i> Linn.	<i>C. album</i> (Lour.) Raeusch.	

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