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OVERVIEW OF FOREST PESTS

THAILAND

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DISCLAIMER

The aim of this document is to give an overview of the forest pest[1] situation in Thailand. It is not intended to be a comprehensive review.

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

[1] Pest: Any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products (FAO, 2004).

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Background

This paper is one of a series of FAO documents on forest-related health and biosecurity issues. The purpose of these papers is to provide early information on on-going activities and programmes, and to stimulate discussion.

In an attempt to quantify the impacts of the many factors that affect the health and vitality of a forest, the Global Forest Resources Assessment 2005 (FRA 2005) asked countries to report on the area of forest affected by disturbances, including forest fires, insects, diseases and other disturbances such as weather-related damage. However, most countries were not able to provide reliable information because they do not systematically monitor these variables.

In order to obtain a more complete picture of forest health, FAO continues to work on several follow-up studies. A review of forest pests in both naturally regenerating forests and planted forests was carried out in 25 countries representing all regions of the world. This *Overview of forest pests* represents one paper resulting from this review. Countries in this present series include Argentina, Belize, Brazil, Chile, China, Cyprus, Colombia, Ghana, Honduras, India, Indonesia, Kenya, Kyrgyz Republic, Malawi, Mauritius, Mexico, Moldova, Mongolia, Morocco, South Africa, Sudan, Thailand, Romania, Russian Federation, Uruguay; this list will be continuously updated.

Comments and feedback are welcome. For further information or if you are interested in participating in this process and providing information on insect pests, diseases and mammals affecting forests and the forest sector in your country, please contact:

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THAILAND

Introduction

Thailand is moderately forested, although its forest cover has roughly halved since 1960. Of Thailand's 51 million hectares of land, 14.5 million hectares, or 28 percent, are forested (FAO, 2006). Most of the forests are restricted to relatively inaccessible mountainous areas. The main forest types are evergreen montane rain forest; mixed deciduous monsoon forest; and open dry dipterocarp and savannah forests. *Dipterocarpus* spp., *Shorea* spp. and *Hopea* spp. are among the most prevalent species. Teak (*Tectona grandis*) has generally been the most important timber species.

The country has about 3.1 million hectares of planted forests (about half of which are rubber plantations) representing over 21 percent of the total forest area (FAO, 2006). A network of parks and reserves encompasses more than 10 percent of the total land area. By 1999, 56 percent of the existing forest areas had been declared national conserved forests.

Thailand's forest resources have been subjected to continuing pressure and devastation. Between the 1960s and the 1980s, forest resources were reduced by shifting cultivation, land resettlement, dam and road construction and conversion to agricultural use. Demand for land for subsistence farming, commercial agriculture, physical infrastructure, tourism and other uses remains high.

Thailand banned all commercial logging in naturally regenerating forests in 1988 and has instituted supporting measures to protect the remaining forests and to promote private-sector involvement in forest management and plantations. Nevertheless, deforestation and forest degradation have continued, and efforts to combat forest loss remain a leading issue in the country. From 2000 to 2005 forest cover decreased at an annual rate of 0.4 percent, down from 0.7 percent between 1990 and 2000 (FAO, 2006).

Reforestation has been practiced in Thailand since the beginning of the twentieth century, when teak was planted in taungya plantations, but only small areas were planted annually until the reforestation programme was expanded in 1961. In 1988, the country undertook an accelerated reforestation programme after devastating floods destroyed two villages. During the mid-1990s, Thailand initiated various programmes to reforest 800 000 ha. Because of budgetary constraints, land-use conflicts and various structural impediments, the target has not been reached.

Forest pests

Naturally regenerating forests

Insects

Indigenous insects

***Eutectona machaeralis* Walker, 1859**

Other scientific names:

Lepidoptera: Pyralidae
Common names: teak skeletonizer; teak leaf skeletonizer
Host type: broadleaf
Hosts: *Tectona grandis*

Eutectona machaeralis is a major pest of teak, occurring throughout South Asia and some parts of Southeast Asia. Complete defoliation by the pests results in more or less leaflessness during most of the growing period.

Outbreaks of this species occur in most years with exceptionally heavy build-up in some years. Although the insect is present throughout the year, outbreaks develop towards the end of the growing season before normal leaf shedding (Nair, 2001).
http://www.worldagroforestrycentre.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SpID=1603

***Hyblaea puera* (Cramer, 1777)**

Other scientific names: *Phalaena puera*; *Noctua saga*; *Noctua unxia*; *Heliothis apricans*
Lepidoptera: Hyblaeidae
Common names: teak defoliator
Host type: broadleaf
Hosts: *Alstonia scholaris*; *Avicennia* spp.; *Callicarpa* spp.; *Pterocarpus macrocarpus*; *Rhizophora* spp.; *Tectona grandis*; *Vitex* spp.

The larvae of this moth species feed on the leaves of a wide range of plants including *Avicennia* spp., *Callicarpa* spp., *Rhizophora* spp., *Vitex* spp. and *Tectona grandis*. In Thailand, it is a pest of *Alstonia scholaris*, *Pterocarpus macrocarpus* and *Tectona grandis.* It is considered to be a major pest of teak plantations in areas of Asia.

The larvae create shelters for themselves by cutting pieces of leaves and rolling them together. They come out of the shelters to feed by night. *Hyblaea puera* is widespread throughout the tropics occurring in Asia, Australia, the Pacific Islands, Africa, Central America and South America.
http://www.cabicompendium.org/NamesLists/FC/Full/HYBLPU.htm
http://www.usyd.edu.au/macleay/larvae/hybl/puera.html
http://www.forest.go.th/fig/nbcrc/nbcrc_e.html
http://www.cifor.cgiar.org/publications/pdf_files/Books/Nair.pdf
http://www.cifor.cgiar.org/publications/pdf_files/Insect-pests.pdf

***Xyleutes ceramica* Walker**

Other scientific names: *Zeuzera ceramica*; *Duomitus ligneus*; *Eudoxyba bosschae*
Lepidoptera: Cossidae
Common names: beehole borer; teak beehole borer
Host type: broadleaf
Hosts: *Callicarpa* spp.; *Clerodendrum* spp.; *Gmelina* spp.; *Tectona* spp.; *Erythrina* spp.; *Sesbania* spp.; *Spathodea* spp.; *Duabanga* spp.

This species of moth is considered by some as “teak’s worst and least understood pest”. The larvae of this moth bore into the heartwood of teak where it causes significant

damage. It is known to feed on species of *Callicarpa, Clerodendrum, Gmelina, Tectona* (Verbenaceae), *Erythrina, Sesbania* (Leguminosae), *Spathodea* (Bignoniaceae), and *Duabanga* (Sonneratiaceae). It occurs in Asia through to New Guinea.
http://www.forest.go.th/FIG/nbcrc/xc_e.html
http://www.forest.go.th/fig/nbcrc/nbcrc_e.html
http://www.mothsofborneo.com/part-1/cossidae/cossidae-4-4.php

***Zeuzera coffeae* Nietner, 1861**

Other scientific names: *Zeuzera oblita*
Lepidoptera: Cossidae
Common names: cocoa pod borer; cocoa stem borer; red borer; red coffee borer; red branch borer; wood moth
Host type: broadleaf
Hosts: *Coffea* spp.; *Eucalyptus deglupta*; *Terminalia brassii*; *Acalypha* spp.; *Psidium* spp.; *Crataegus* spp.; *Citrus* spp.; *Theobroma* spp.; *Casuarina* spp.

Larval wood moths tunnel the heartwood of living trees. They create large holes in the timber which degrades its value. The development from an egg to an adult can take several years during which the larvae create a J-shaped tunnel of very large diameter. The large holes usually cause smaller trees to become more susceptible to wind damage. Adult wood moths are some of the largest and heaviest moths in the world with a body weight up to 25 grams. Cossids are not common and are usually considered minor pests but their damage is usually discovered in the saw mill. *Zeuzera coffeae* usually attacks coffee plants but can also cause some damage on a wide range of other hosts including *Eucalyptus deglupta*, *Terminalia brassii*, and species of *Acalypha*, *Psidium*, *Crataegus*, *Citrus*, *Theobroma* and *Casuarina*.
http://www.fzi.uni-freiburg.de/InsectPestKey-long%20version/lepidopt.htm
http://www.mothsofborneo.com/part-1/cossidae/cossidae-3-4.php

Introduced insects

No information was available on introduced insects impacting the naturally regenerating forests of Thailand.

Diseases

Indigenous diseases

No information was available on indigenous diseases impacting the naturally regenerating forests of Thailand.

Introduced diseases

No information was available on introduced diseases impacting the naturally regenerating forests of Thailand.

Other pests

Indigenous other pests

No records were available of other indigenous pests (e.g. mites, nematodes, mammals, etc.) affecting naturally regenerating forests in Thailand.

Introduced other pests

No records were available of other introduced pests (e.g. mites, nematodes, mammals, etc.) affecting naturally regenerating forests in Thailand.

Diebacks and other conditions

No records were available for diebacks and other conditions affecting the naturally regenerating forests of Thailand.

Planted forests

Insects

Indigenous insects

***Acalolepta cervina* (Hope)**

Other scientific names: *Dihammus cervinus*
Coleoptera: Cerambycidae
Common names: teak canker grub
Host type: broadleaf
Hosts: *Tectona grandis*

Adults feed on the bark of teak saplings 2-8 years old and lay eggs on the stem beneath the bark, near ground level. Feeding and tunnelling by larvae causes formation of a bulging canker all around the stem at which point the saplings may break. *Acalolepta cervina* occurs in northern India, Myanmar and Thailand.
http://www.forest.go.th/FIG/pests/acalolepta/acalolepta_t.htm (In Thai)
http://www.forest.go.th/fig/nbcrc/nbcrc_e.html

***Alcidodes frenatus* Feisthamel**

Other scientific names:
Coleoptera: Curculionidae
Common names:
Host type: broadleaf
Hosts: *Tectona grandis*

Alcidodes frenatus feeds on the twigs and leaves (midribs) of teak.

Alcidodes ludificator

Other scientific names: *Alcides gmelinae*
Coleoptera: Curculionidae
Common names:

Host type: broadleaf
Hosts: *Gmelina arborea*; *Tectona grandis*

Alcidodes ludificator is a small beetle that lays eggs in galleries made in the green shoot of seedlings in nurseries causing dieback or death of seedlings (Nair, 2001).

***Apoderus notatus* (Fabricius 1792)**

Other scientific names:
Coleoptera: Curculionidae
Common names: giraffe weevil
Host type: broadleaf
Hosts: *Dipterocarpus alatus*; *D. tuberculatus*; *Eucalyptus* spp.; *Eugenia* spp.; *Eugenia jambos*; *Lagerstroemia* spp.; *L. loudonii*; *L. macracarpa*; *L. speciosa*; *L. tomentosa*; *Mangifera* spp.; *Shorea obtusa*; *S. roxburghii*; *S. siamensis*; *Spondias pinnata*; *Terminalia catappa*

http://www.forest.go.th/FIG/pests/others/apoderus_t.htm (In Thai)

***Archips micaceana* (Walker)**

Other scientific names: *Cacoecia micaceana* (Walker)
Lepidoptera: Tortricidae
Common names:
Host type: broadleaf
Hosts: *Acacia mangium*

Archips micaceana is a pest of the exotic *Acacia magnium* in Thailand (Nair, 2001).
http://www.forest.go.th/FIG/pests/others/archips_t.htm (In Thai)
http://plantpro.doae.go.th/plantclinic/clinic/plant/sunflower/leaf.htm (In Thai)

***Aristobia approximator* (Thomson, 1865)**

Other scientific names: *Celosterna approximator* Thomson, 1865
Coleoptera: Cerambycidae
Common names: long-horned beetle; Aristobia longhorn beetle
Host type: broadleaf
Hosts: *Pterocarpus macrocarpus*; *Casuarina junghuhniana*

Aristobia approximator is a longhorn beetle known to attack *Pterocarpus macrocarpus* in Thailand. It has also been reported causing minor damage to young shoots of *Casuarina junghuhniana* in planted forests.
http://food-security.info/food-security.info/Winrock%20Archive/c_jung.html

***Aristobia horridula* (Hope, 1831)**

Other scientific names: *Lamia horridula* Hope, 1831; *Cerosterna fasciculata*
Coleoptera: Cerambycidae
Common names: Pradu stemborer; long-horned beetle
Host type: broadleaf
Hosts: *Dalbergia cochinchinensis*; *Pterocarpus macrocarpus*; *P. indicus*; *Xylia xylocarpa*

Aristobia horridula is reported as the most important stem borer of *Pterocarpus macrocarpus* in Thailand where damage to *P. macrocarpus* plantations was as high as 83 percent (Hutacharern and Panya, 1996). This insect also attacks *P. indicus*, *Dalbergia cochinchinensis* and *Xylia xylocarpa*.
http://www.forest.go.th/FIG/pests/others/aristobia_t.htm (In Thai)

***Batocera rubus* (Linnaeus, 1758)**

Other scientific names: *Batocera albofasciata* De Geer, 1775; *Batocera albomaculatus* Retz.
Coleoptera: Cerambycidae
Common names: rubber root borer; lateral-banded mango longhorn; mango longhorn beetle
Host type: broadleaf
Hosts: *Hevea brasiliensis*

Batocera rubus is a large wood borer that has been recorded on *Hevea brasiliensis* in Thailand, particularly on trees damaged by other causes such as fire and lightning (Nair, 2001). Larvae also feed on freshly felled timber.
http://www.cabicompendium.org/NamesLists/FC/Full/BATORB.htm

***Calopepla leayana* (Latreille, 1807)**

Other scientific names: *Craspedonta leayana*; *Imatidium leayanum* Latreille; *Cassida leayana* Olivier; *Calopepla leayana ab. nigriventris* Weise
Coleoptera: Chrysomelidae
Common names: gamar defoliator; gamhar defoliator; yemane defoliator; yemane tortoise beetle
Host type: broadleaf
Hosts: *Gmelina arborea*

The defoliator *Calopepla leayana* appears to be most important insect pest of *Gmelina arborea* in plantations within the natural range of the tree (Wingfield and Robison, 2004). It is perhaps the most widely reported and studied defoliator of *G. arborea* in Asia.

Young larvae feed mainly on the undersurface of gamar (*Gmelina arborea*) leaves, leaving only the mid-ribs and main veins intact. The adult beetle feeds on the leaf, cutting large circular holes, and also eats young buds and shoots. Heavy infestation leads to drying up of shoots of young trees and the trees remain leafless for about 4 months of the growing season leading to ultimate death.
http://www.cabicompendium.org/NamesLists/FC/Full/CLPPLE.htm
http://www.springerlink.com/content/j41r34826g7h0620/fulltext.pdf

***Catopsilia crocale crocale* Cramer**

Other scientific names:
Lepidoptera: Pieridae
Common names: common emigrant; yellow Asian butterfly
Host type: broadleaf

Hosts: *Cassia siamea*; *C. fistula*; *C. baderiana*; *C. alata*; *C. tora*; *Bauhimia* spp.; *Butea monosperma*; *Sesbania grandiflora*

Catopsilia crocale crocale is a pest of many species in Thailand, *Cassia* spp. in particular.
http://meghalaya.nic.in/butterfy/pieridae.htm
http://www.hort.purdue.edu/newcrop/duke_energy/Cassia_fistula.html

***Catopsilia pomona pomona* (Fabricius, 1775)**

Other scientific names: *Callidryas crocale*
Lepidoptera: Pieridae
Common names: lemon migrant; lemon emigrant; cassia butterfly
Host type: broadleaf
Hosts: *Cassia siamea*; *C. fistula*; *C. baderiana*; *C. alata*; *C. tora*; *Bauhimia* spp.; *Butea monosperma*; *Sesbania grandiflora*

Catopsilia pomona pomona is a pest of many species in Thailand, *Cassia* spp. in particular.
http://anic.ento.csiro.au/entomid-png/taxon_details.asp?BiotaID=6626
http://www.ento.csiro.au/aicn/name_s/b_885.htm
http://www.deh.gov.au/cgi-bin/abrs/fauna/details.pl?pstrVol=PAPILIONOIDEA;pstrTaxa=1379;pstrChecklistMode=2
http://www.srilankaninsects.net/butterflies/Pieridae/LemonEmigrant/LemonEmigrant.htm
http://www.nss.org.sg/butterflysingapore/expert/200109-LE/200109-LE.htm
http://yutaka.it-n.jp/pie/20490001.html
http://www.hort.purdue.edu/newcrop/duke_energy/Cassia_fistula.html
http://www-staff.it.uts.edu.au/~don/larvae/pier/pomona.html

***Catopsilia pyranthe pyranthe* (Fabricius, 1775)**

Other scientific names:
Lepidoptera: Pieridae
Common names: mottled emigrant
Host type: broadleaf
Hosts: *Cassia siamea*; *C. fistula*; *C. baderiana*; *C. alata*; *C. tora*; *Bauhimia* spp.; *Butea monosperma*; *Sesbania grandiflora*

Catopsilia pyranthe pyranthe is a pest of many species in Thailand, *Cassia* spp. in particular.
http://www.nss.org.sg/butterflysingapore/expert/Catopsilia-pyranthe/catopsilia-pyranthe.htm
http://yutaka.it-n.jp/pie/20480001.html
http://www.hort.purdue.edu/newcrop/duke_energy/Cassia_fistula.html
http://www.srilankaninsects.net/Butterflies/Pieridae/MottledEmigrant/MottledEmigrant.htm

***Celosterna pollinosa sulphurea* Heller**

Other scientific names: *Cerosterna pollinosa sulphurea*
Coleoptera: Cerambycidae
Common names: Yangna stem borer
Host type: broadleaf
Hosts: *Dipterocarpus alatus*; *Anisoptera costata*

The cerambycid, *Celosterna pollinosa sulphurea* attacks *Dipterocarpus alatus* in Thailand.
http://www.forest.go.th/FIG/pests/others/celosterna_t.htm
http://www.worldagroforestrycentre.org/sea/Products/AFDbases/AF/asp/SpeciesInfo.asp?SpID=1774

***Coptotermes curvignathus* Holmgren**

Other scientific names: *Coptotermes robustus*
Isoptera: Rhinotermitidae
Common names: termite; white ants
Host type: broadleaf and conifer
Hosts: *Pinus* spp.; *Hevea brasiliensis*; *Acacia mangium*; *Paraserianthes falcataria*; *Gmelina arborea*; *Koompassia malaccensis*; *Buchanania sessifolia*

Coptotermes curvignathus is a subterranean termite that attacks a wide range of trees and is capable of killing healthy trees. Forest plantation trees attacked by this termite in Southeast Asia include pines and all other species of conifers, rubber trees (*Hevea brasiliensis*), *Acacia mangium*, *Paraserianthes falcataria* and *Gmelina arborea*. Many native tree species that occur in naturally regenerating forests are also susceptible including *Koompassia malaccensis* and *Buchanania sessifolia*. *Pinus* species are particularly susceptible to this termite and are frequently killed by attacks from this termite.
http://www.chem.unep.ch/pops/termites/termite_ch5.htm

***Coptotermes gestroi* (Wasmann, 1896)**

Other scientific names: *Coptotermes havilandi* Holmgren
Isoptera: Rhinotermitidae
Common names: Asian subterranean termite
Host type: broadleaf
Hosts: *Hevea brasiliensis*

Coptotermes gestroi is a subterranean termite that is a destructive pest of standing trees, agricultural crops and timber in service. This species of termite lives in tropical areas. As with all termites, it is social, living in large colonies where there are distinct castes (body types) that align with the functions that an individual carries out. There are few individuals that reproduce within the colonies; the other individuals are sterile and have functions such as food gathering or protection of the colony. The reproductive individuals are often long-lived (sometimes years), whereas the other individuals are usually not as long-lived. They can build nests in tree trunks or voids in buildings; however a source of moisture is required for survival.

Two main means of dispersal are by winged reproductive adults that shed their wings after the dispersal flight and transportation in freshly felled logs or infested timber.
http://www.fcla.edu/FlaEnt/fe80p408.pdf
http://www.padil.gov.au/viewPest.aspx?id=296
http://creatures.ifas.ufl.edu/urban/termites/havilandi.htm

Craspedonta mouhoti

Other scientific names:
Coleoptera: Chrysomelidae
Common names:
Host type: broadleaf
Hosts: *Gmelina arborea*

Craspedonta mouhoti is a pest of native plantations of *Gmelina arborea* in Thailand (Nair, 2001).

Cyrtotrachelus dichrous

Other scientific names:
Coleoptera: Curculionidae
Common names:
Host type: broadleaf
Hosts: *Dendrocalamus strictus*; *D. giganteus*; *D. asper*; *Gigantochloa hasskarliana*; *Bambusa blumeana*; *B. arundinacea*; *B. randisii*; *B. nana*; *Thyrsostachys siamensis*; *Cephalostachyum pergracile*; *Rhapis excelsa*; *Phyllostachys bawacamus*; *P. mannii*

Cyrtotrachelus dichrous is a pest of many bamboo species in Thailand.
http://www.forest.go.th/FIG/pests/others/cyrtotrachelus_t.htm

Cyrtotrachelus longimanus

Other scientific names:
Coleoptera: Curculionidae
Common names: bamboo shoot weevil
Host type: broadleaf
Hosts: *Dendrocalamus strictus*; *D. giganteus*; *D. asper*; *Gigantochloa hasskarliana*; *Bambusa blumeana*; *B. arundinacea*; *B. randisii*; *B. nana*; *Thyrsostachys siamensis*; *Cephalostachyum pergracile*; *Rhapis excelsa*; *Phyllostachys bawacamus*; *P. mannii*

Cyrtotrachelus longimanus is a pest of many bamboo species in Thailand.
http://www.forest.go.th/FIG/pests/others/cyrtotrachelus_t.htm

***Dasychira mendosa* Huebner**

Other scientific names:
Lepidoptera: Lymantriidae
Common names: tussock moth; tiger moth caterpillar
Host type: broadleaf
Hosts: *Acacia mangium*

Dasychira mendosa is known to attack *Acacia mangium* in Thailand (Nair, 2001).

***Dichocrocis punctiferalis* (Guenée)**

Other scientific names:
Lepidoptera: Pyralidae
Common names: castor pod borer; yellow peach moth
Host type: broadleaf
Hosts: *Tectona grandis*

Dichocrocis punctiferalis is a main pest of flowering shoots and young fruits of teak in Thailand (Nair, 2001).
http://www.ento.csiro.au/aicn/name_s/b_1379.htm
http://www.invasive.org/browse/subimages.cfm?sub=9258

***Ectropis bhurmitra* (Walker, 1860)**

Other scientific names: *Boarmia bhurmitra* Walker, 1860; *Boarmia diffusaria* Walker, 1860; *Scioglyptis semifascia* Warren, 1897; *Ectropis sabulosa* Warren, 1897; *Heterostegane semifasciata*; *Ectropis brevifasciata* Wileman, 1912
Lepidoptera: Geometridae
Common names: common looper; tea twig caterpillar; twig caterpillar; inch worm; earth measurer
Host type: broadleaf
Hosts: *Azadirachta excelsa*

Ectropis bhurmitra is a pest of *Azadirachta excelsa* in Thailand where it has caused considerable damage, particularly in Chumporn and Rayong provinces.
http://www.mothsofborneo.com/part-11/Boarmiini/boarmiini_29.php
http://www.forest.go.th/FIG/pests/others/ectropis_t.htm (In Thai)
http://www.forest.go.th/research/Journal/Vol1_No2/insect.htm (In Thai with English Abstract)
http://www.cabicompendium.org/NamesLists/CPC/Full/ECTRBH.htm

***Eutectona machaeralis* Walker, 1859**

Other scientific names:
Lepidoptera: Pyralidae
Common names: teak skeletonizer; teak leaf skeletonizer
Host type: broadleaf
Hosts: *Alstonia scholaris*; *Pterocarpus macrocarpus*; *Tectona grandis*

Eutectona machaeralis is a major pest of teak, occurring throughout South Asia and some parts of Southeast Asia. In Thailand, it has also been reported on *Alstonia scholaris* and *Pterocarpus macrocarpus.* Complete defoliation by the pests results in more or less leaflessness during most of the growing period.

Outbreaks of this species occur in most years with exceptionally heavy build-up in some years. Although the insect is present throughout the year, outbreaks develop towards the end of the growing season before normal leaf shedding (Nair, 2001).

It has been suggested that species identified as *Eutectona machaeralis* in Thailand are actually *Paliga damastesalis* (Nair, 2001).
http://www.worldagroforestrycentre.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SpID=1603

Glena indiana

Other scientific names:
Coleoptera: Cerambycidae
Common names: sapwood borer
Host type: broadleaf
Hosts: *Gmelina arborea*

Glena indiana is a serious pest of *Gmelina arborea* in India, Myanmar and Thailand. It has destroyed plantations in northern Thailand. Attacks begin in year-old saplings and continue in following years, often resulting in death of the trees at 8-10 years (Nair, 2001).

***Holotrichia* sp. *near longicarinata* (Brenske)**

Other scientific names:
Coleoptera: Scarabaeidae
Common names: melolonthine beetle; white grub
Host type: broadleaf
Hosts: *Azadirachta excelsa*

Holotrichia sp. *near longicarinata* is a pest of *Azadirachta excelsa* in Thailand where it has caused considerable damage, particularly in Chumporn and Rayong provinces.
http://www.forest.go.th/research/Journal/Vol1_No2/insect.htm
http://www.dnp.go.th/FIG/pests/others/holotrichia_t.htm

***Hyblaea puera* (Cramer, 1777)**

Other scientific names: *Phalaena puera*; *Noctua saga*; *Noctua unxia*; *Heliothis apricans*
Lepidoptera: Hyblaeidae
Common names: teak defoliator
Host type: broadleaf
Hosts: *Alstonia scholaris*; *Avicennia* spp.; *Callicarpa* spp.; *Pterocarpus macrocarpus*; *Rhizophora* spp.; *Vitex* spp.; *Tectona grandis*

The larvae of this moth species feed on the leaves of a wide range of plants including *Avicennia* spp., *Callicarpa* spp., *Rhizophora* spp., *Vitex* spp. and *Tectona grandis*. In Thailand, it is a pest of *Alstonia scholaris*, *Pterocarpus macrocarpus* and *Tectona grandis.* It is considered to be a major pest of teak plantations in areas of Asia. The larvae create shelters for themselves by cutting pieces of leaves and rolling them together. They come out of the shelters to feed by night. *Hyblaea puera* is widespread throughout the tropics occurring in Asia, Australia, the Pacific Islands, Africa, Central America and South America.
http://www.forest.go.th/FIG/pests/hyblaea/hyblaea_t.htm (In Thai)
http://www.forest.go.th/fig/nbcrc/nbcrc_e.html

http://www.cifor.cgiar.org/publications/pdf_files/Books/Nair.pdf
http://www.cifor.cgiar.org/publications/pdf_files/Insect-pests.pdf
http://www.cabicompendium.org/NamesLists/FC/Full/HYBLPU.htm
http://www.usyd.edu.au/macleay/larvae/hybl/puera.html

Hypomeces squamosus (Fabricius, 1792)

Other scientific names: *Curculio pulverulentus* Fabricius; *Curculio aurulentus* Herbst; *Curculio orientalis* Olivier; *Atemtonychus gossipi* Matsumura; *Atemtonychus peregrinus* Matsumura
Coleoptera: Curculionidae
Common names: green weevil; gold-dust beetle; gold-dust weevil
Host type: broadleaf
Hosts: *Samanea saman*; *Cassia fistura*; *Casuarina junghuhniana*; *Eucalyptus* spp.; *Siphonodon celastrineus*; *Sindora siamensis*; *Passiflora foetida*; *Dipterocarpus obtusifolius*; *Melia azedarach*; *Acacia auriculiformis*; *Peltophorum pterocarpum*; *Tectona grandis*; *Swietenia* spp.; *Pterocarpus macrocarpus*; *Xylia xylocarpa*

Hypomeces squamosus is a pest of many broadleaf species in Thailand.
http://www.forest.go.th/FIG/pests/others/hypomeces_t.htm (In Thai)
http://www.padil.gov.au/viewPestDiagnosticImages.aspx?id=78
http://www.padil.gov.au/viewPest.aspx?id=78
http://www.hort.purdue.edu/newcrop/duke_energy/Acacia_auriculiformis.html
http://www.cabicompendium.org/NamesLists/FC/Full/HPMCSQ.htm

Hypsipyla robusta Moore, 1886

Other scientific names: *Epicrocis terebrans* Oliff, 1890; *Magiria robusta* Moore, 1886; *Hypsipyla scabrusculella* Ragonot, 1893; *Hypsipyla pagodella* Ragonot, 1888
Lepidoptera: Pyralidae
Common names: mahogany shoot borer; cedar tip moth; toon shoot fruit borer
Host type: broadleaf
Hosts: *Cedrella* spp.; *Chukrasia tabularis*; *Khaya* spp.; *Swietenia mahogani*; *Swietenia macrophylla*; *Tectona grandis*; *Toona australis*; *Toona ciliata*

Hypsipyla robusta caterpillars bore into the tips and shoots of several species of high quality timber species. They feed on a range of plants in Meliaceae and Verbenaceae including *Swietenia macrophylla, Toona ciliata*, *Cedrella* spp. and *Tectona* spp. They are particular pests of *Swietenia mahogani*, *Toona australis, Toona ciliata* and *Chukrasia tabularis* in Thailand. The caterpillars destroy the apical shoot causing the tree to form many side branches and frequently a deformed trunk. This leads to a decreased value of the timber.

This species mainly attacks trees in high light areas, hence the biggest effects are observed in young planted forests, particularly those planted with a single species. Young understorey trees in naturally regenerating forests suffer far less damage. Plantings of mahogany have been almost completely abandoned in some areas because of the damage caused by this insect.
http://www.forest.go.th/FIG/pests/hypsipyla/hypsipyla_e.htm

http://linus.socs.uts.edu.au/~don/larvae/pyra/robust.html
http://www.aciar.gov.au/web.nsf/att/JFRN-6BN983/$file/pr97chapter2.pdf
http://www.usyd.edu.au/su/macleay/larvae/pyra/robust.html
http://www.fzi.uni-freiburg.de/InsectPestKey-long%20version/hypsipyl.htm
http://www.ansinet.org/fulltext/pjbs/pjbs75848-851.pdf
http://www.cifor.cgiar.org/publications/pdf_files/Insect-pests.pdf

Indarbela spp. Walker

Other scientific names:
Lepidoptera: Metarbelidae
Common names:
Host type: broadleaf
Hosts: *Cassia bakeriana*; *Acacia auriculiformis*; *Albizia procera*; *Anogeissus acuminata*; *Casuarina equisetifolia*; *Tectona grandis*; *Gmelina arborea*; *Eugenia* spp.; *Largerstroemia* spp.; *Mangifera* spp.; *Shorea obtusa*; *Shorea siamensis*; *Xylia xylocarpa*; *Bixa orellana*; *Terminalia chebula*; *Eucalyptus* spp.; *Dipterocarpus alatus*

Indarbela spp. feed on the bark of a variety of broadleaf trees.
http://www.dnp.go.th/FIG/pests/others/indarbela_t.htm (In Thai)

Ips sexdentatus (Börner, 1776)

Other scientific names: *Dermestes sexdentatus* Börner; *Bostrichus pinastri* Bechstein; *Tomicus stenographus* Duftschmidt; *Ips typographus* De Geer
Coleoptera: Scolytidae
Common names: six-toothed bark beetle; twelve-spined ips; pine stenographer beetle; six-spined engraver beetle
Host type: conifer
Hosts: *Pinus* spp.; *P. sylvestris*; *P. nigra*; *P. pinaster*; *P. brutia*; *P. heldrichii*; *Abies alba*; *Abies normanndiana*; *Larix decidua*; *Larix sibirica*; *Picea abies*; *Picea orientalis*; *Pseudotsuga menzeisii*

Ips sexdentatus is considered a secondary pest and attacks trees already suffering stress, either environmental or from other pests. It can kill trees of commercial importance however. Pines are the predominant hosts of this insect across its natural range. In Europe and the Near East, Scotch pine (*Pinus sylvestris*), Austrian pine (*Pinus nigra*), maritime pine (*Pinus pinaster*), Calabrian pine (*Pinus brutia*) and (*Pinus heldrichii*) are reported hosts. Other conifer hosts in Europe and Asia include *Abies alba, Abies normanndiana*, *Larix decidua, Larix sibirica, Picea abies, Picea orientalis* and *Pseudotsuga menzeisii.* *Ips* attacks also introduce blue stain fungi, *Ophiostoma* spp., into host trees, which hasten the death of trees, discolour the wood and can result in loss of lumber grade and value.

Ips sexdentatus prefers to attack large trees with thick bark. This insect typically has two generations per year with adult flight periods from April to May and July to August. In Mediterranean regions of Europe, *I. sexdentatus* can undergo a third generation. Attacks are initiated by the males, who construct nuptial chambers under the bark and are subsequently joined by 2-5 females. After mating, each female constructs a longitudinal egg gallery and deposits eggs in individual niches along each side of the gallery. The

young larvae feed in galleries perpendicular to the egg galleries. Larval galleries increase as the larvae increase in body size. Pupation takes place in round chambers constructed at the ends of the larval galleries. Adults require maturation feeding before reaching sexual maturity.

Adult beetles are capable of flying up to 4 km in search of suitable host material and they are also subject to wind dispersal. Transport of unprocessed logs, wood products or wooden packing materials, dunnage or pallets containing bark strips can provide a means of introduction of immature stages and adults.
http://www.eppo.org/QUARANTINE/insects/Ips_sexdentatus/IPSXSE_ds.pdf
http://spfnic.fs.fed.us/exfor/data/pestreports.cfm?pestidval=79&langdisplay=english
http://www.padil.gov.au/viewPestDiagnosticImages.aspx?id=162
http://www.cabicompendium.org/NamesLists/FC/Full/IPSXSE.htm
http://www.barkbeetles.org/browse/subject.cfm?SUB=887
http://www.forestpests.org/poland/sixtoothedbark.html
http://www.forestpests.org/hungary/weevilsis.html
http://www.barkbeetles.org/exotic/ipsxdnts.html

***Leptocentrus* spp.**

Other scientific names:
Hemiptera: Membracidae
Common names:
Host type: broadleaf
Hosts: *Tectona grandis*

Leptocentrus spp. are a main pest of flowering shoots and young fruits of teak in Thailand (Nair, 2001).

***Machaerota elegans* Maa**

Other scientific names:
Hemiptera: Cercopidae
Common names:
Host type: broadleaf
Hosts: *Tectona grandis*

Machaerota elegans causes significant damage to the flowering shoots and young fruits of teak in Thailand (Nair, 2001).

***Micropistus* sp.**

Other scientific names:
Coleoptera: Buprestidae
Common names:
Host type: broadleaf
Hosts: *Hopea odorata*

http://www.forest.go.th/FIG/pests/others/micropistus_t.htm

***Mylabris phalerata* Pallas**

Other scientific names:
Coleoptera: Meloidae
Common names: Chinese blister beetle; blister beetle
Host type: broadleaf
Hosts: *Tectona grandis*

Mylabris phalerata causes significant damage to the flowering shoots and young fruits of teak in Thailand (Nair, 2001).
http://www.forest.go.th/FIG/pests/others/mylabris_t.htm (In Thai)

***Pagyda salvalis* Walker**

Other scientific names:
Lepidoptera: Pyralidae
Common names:
Host type: broadleaf
Hosts: *Tectona grandis*

Pagyda salvalis is a main pest of the flowering shoots and young fruits of teak in Thailand (Nair, 2001).

***Paliga damastesalis* Walker**

Other scientific names:
Lepidoptera: Pyralidae
Common names: teak skeletonizer; teak leaf skeletonizer
Host type: broadleaf
Hosts: *Tectona grandis*

Paliga damastesalis is a pest of teak in native plantations. It has been suggested that species identified as *Eutectona machaeralis* in Thailand are actually *P. damastesalis* (Nair, 2001).
http://www.forest.go.th/FIG/pests/paliga/paliga_t.htm (In Thai)

Phassus signifier

Other scientific names:
Lepidoptera: Hepialidae
Common names: sapling stem borer
Host type: broadleaf
Hosts: *Tectona grandis*

Phassus signifier is a large caterpillar that feeds on teak saplings. They make a tunnel in the central pith and emerge at night to feed on the bark under a cover of mat of frass, silk and wood dust (Nair, 2001). Such feeding causes a canker to form at which point the stem may break. While damage in young plantations is conspicuous overall damage is not believed to be significant.

***Physomerus grossipes* (Fabricius)**

Other scientific names:
Coleoptera: Coreidae
Common names: large spined-footed bug
Host type: broadleaf
Hosts:

http://www.forest.go.th/FIG/pests/others/physomerus_t.htm

Pionea aureolalis

Other scientific names:
Lepidoptera: Pyralidae
Common names:
Host type: broadleaf
Hosts: *Gmelina arborea*

Pionea aureolalis is known from native plantations of *Gmelina arborea* in Thailand (Nair, 2001).

***Prioptera* spp.**

Other scientific names:
Lepidoptera: Pyralidae
Common names:
Host type: broadleaf
Hosts: *Gmelina arborea*

Three *Prioptera* species are known from native plantations of *Gmelina arborea* in Thailand (Nair, 2001).

***Pseudoregma* spp.**

Other scientific names:
Hemiptera: Pemphigidae
Common names: bamboo aphid
Host type: broadleaf
Hosts:

http://www.forest.go.th/FIG/pests/others/pseudoregma_t.htm (In Thai)

***Psilogramma menephron* (Cramer, 1780)**

Other scientific names: *Macrosila jordana*
Lepidoptera: Sphingidae
Common names: Australian privet hawk moth
Host type: broadleaf
Hosts: *Millingtonia hortensis*; *Paulownia fortunei*; *Tectona grandis*

http://www.forest.go.th/FIG/pests/others/psilogramma_t.htm (In Thai)
http://www.arbec.com.my/moths/sphingidae/sphingidae_5_1.php
http://www-staff.mcs.uts.edu.au/~don/larvae/sphi/menephr.html

http://www.ento.csiro.au/gallery/moths/Psilogrammamenephron
http://www.ento.csiro.au/aicn/name_s/b_3496.htm
http://anic.ento.csiro.au/entomid-png/taxon_details.asp?BiotaID=9925

***Sagra femorata* (Cramer, 1780)**

Other scientific names:
Coleoptera: Chrysomelidae
Common names:
Host type: broadleaf
Hosts:

http://www.forest.go.th/FIG/pests/others/sagra_t.htm (In Thai)

***Sinoxylon anale* Lesne, 1897**

Other scientific names:
Coleoptera: Bostrychidae
Common names: auger beetle
Host type: broadleaf
Hosts: *Acacia mangium*; *Koompassia melaccensis; Acacia* spp.; *Dalbergia* spp.; *Delonix* spp.; *Hevea brasiliensis*; *Leucaena* spp.; *Mallotus* spp.; *Shorea* spp.; *Terminalia* spp.; *Xylia* spp.

Sinoxylon anale is a significant pest of agricultural, forestry and forest product industries as they are very harmful to trees, bamboos and wood. It is a common species in the forests, timber depots, sawmills and furniture industries, and is a primary borer in the sapwood of logs, and timbers used in house building, boxes, and packing cases.

In Thailand, *S. anale* is known to bore into the branches and twigs of *Acacia mangium* trees (Nair, 2001) and it has also been recorded infesting *Koompassia melaccensis.* In India, it is considered one of the most destructive wood borers in India, attacking a wide variety of plants. Other recorded host species include *Acacia* spp., *Dalbergia* spp., *Delonix* spp., *Hevea brasiliensis*, *Leucaena* spp., *Mallotus* spp., *Shorea* spp., *Terminalia* spp. and *Xylia* spp.
http://www.padil.gov.au/viewPestDiagnosticImages.aspx?id=105
http://www.padil.gov.au/viewPest.aspx?id=105
http://www.ento.csiro.au/aicn/name_s/b_3744.htm

***Sternocera* spp.**

Other scientific names:
Coleoptera: Buprestidae
Common names:
Host type: broadleaf
Hosts: *Acacia mangium*

The larvae of *Sternocera* spp. bore into the root collar of *Acacia mangium* trees in Thailand (Nair, 2001).

Tingis beesoni

Other scientific names:
Hemiptera: Tingidae
Common names: lace bug
Host type: broadleaf
Hosts: *Gmelina arborea*

Tingis beesoni causes serious damage to *Gmelina arborea* saplings (Nair, 2001). These bugs feed gregariously at the base of the leaf blade and soft shoots. Necroic lesions develop leading to defoliation and shoot dieback. The fungus *Nattrassia mangiferae* is often associated with attacks of *T. beesoni* on *Gmelina arborea*; the two agents contributing to the dieback and death of saplings (Nair, 2001).

***Xyleutes ceramica* Walker**

Other scientific names: *Zeuzera ceramica*; *Duomitus ligneus*; *Eudoxyba bosschae*
Lepidoptera: Cossidae
Common names: beehole borer; teak beehole borer
Host type: broadleaf
Hosts: *Callicarpa* spp.; *Clerodendrum* spp.; *Gmelina* spp.; *Tectona* spp.; *Erythrina* spp.; *Sesbania* spp.; *Spathodea* spp.; *Duabanga* spp.

This species of moth is considered by some as "teak's worst and least understood pest". The larvae of this moth bore into the heartwood of teak where it causes significant damage. It is known to feed on species of *Callicarpa, Clerodendrum, Gmelina, Tectona* (Verbenaceae), *Erythrina, Sesbania* (Leguminosae), *Spathodea* (Bignoniaceae), and *Duabanga* (Sonneratiaceae). It occurs in Asia through to New Guinea.
http://www.forest.go.th/FIG/nbcrc/xc_e.html
http://www.forest.go.th/fig/nbcrc/nbcrc_e.html
http://www.mothsofborneo.com/part-1/cossidae/cossidae-4-4.php

***Xylosandrus compactus* (Eichhoff)**

Other scientific names: *Xyleborus morstatti* Hagedorn, 1912; *Xyleborus compactus* Eichhoff; *Xylosandrus morstatti* (Hagedorn)
Coleoptera: Scolytidae
Common names: black twig borer; ambrosia beetle; shot-hole borer; tea stem borer; black coffee twig borer; black coffee borer
Host type: broadleaf
Hosts: *Swietenia macrophylla*

In Thailand, *Xylosandrus compactus* is a species of scolytid beetle that bores into the stem of *Swietenia macrophylla* seedlings in nurseries and lays eggs in galleries causing the seedlings to collapse (Nair, 2001). Native to Asia, *X. compactus* has spread to many coffee growing areas throughout the world where it causes damage not only to agricultural crops, but also to native forest trees.
http://www.invasivespecies.net/database/species/ecology.asp?si=175&fr=1&sts
http://www.barkbeetles.org/browse/subject.cfm?SUB=426
http://www.insectimages.org/browse/subimages.cfm?sub=426

http://creatures.ifas.ufl.edu/trees/black_twig_borer.htm
http://www.extento.hawaii.edu/kbase/crop/Type/xylosand.htm
http://www.cabicompendium.org/NamesLists/FC/Full/XYLSCO.htm

***Zeuzera coffeae* Nietner, 1861**

Other scientific names: *Zeuzera oblita*
Lepidoptera: Cossidae
Common names: red borer; cocoa pod borer; cocoa stem borer; wood moth; red branch borer; red coffee borer
Host type: broadleaf
Hosts: *Chukrasia tabularis*; *Coffea* spp.; *Eucalyptus deglupta*; *Terminalia brassii*; *Acalypha* spp.; *Psidium* spp.; *Crataegus* spp.; *Citrus* spp.; *Theobroma* spp.; *Casuarina* spp.

Larval wood moths tunnel the heartwood of living trees. They create large holes in the timber which degrades its value. The development from an egg to an adult can take several years during which the larvae create a J-shaped tunnel of very large diameter. The large holes usually cause smaller trees to become more susceptible to wind damage. Adult wood moths are some of the largest and heaviest moths in the world with a body weight up to 25 grams. Cossids are not common and are usually considered minor pests but their damage is usually discovered in the saw mill. *Zeuzera coffeae* usually attacks coffee plants but can also cause some damage on a wide range of other hosts including *Eucalyptus deglupta*, *Terminalia brassii*, and species of *Acalypha*, *Psidium*, *Crataegus*, *Citrus*, *Theobroma* and *Casuarina*. In Thailand, it has also been reported on *Chukrasia tabularis.*
http://www.fzi.uni-freiburg.de/InsectPestKey-long%20version/lepidopt.htm
http://www.mothsofborneo.com/part-1/cossidae/cossidae-3-4.php

Introduced insects

***Brontispa longissima* (Gestro, 1885)**

Other scientific names:
Coleoptera: Chrysomelidae
Common names: coconut leaf beetle; coconut hispid beetle; coconut chrysomelid hispine beetle; coconut hispine beetle
Host type: broadleaf
Hosts: *Cocos nucifera*

Brontispa longissima is potentially the most serious pests of coconut palms. Both larvae and adults of the beetle inhabit the developing, unopened leaves of the coconut palm where they feed on leaf tissues. Where an attack is severe, complete defoliation of the palms may result. Prolonged attack, particularly to young or unhealthy palms, may result in tree death.

B. longissima represents a threat to the coconut industry of southern and central Thailand with US$30 million production and 50 000 smallholder farmers. It is also a threat to the tourist industry of Koh Samui and Koh Pa-ngan.

Damage caused by the coconut leaf beetle was first recorded in Narathiwas province, the border area near Malaysia, in 2000. Heavy infestation was first reported in February 2004 in southern provinces including Surat Thani (Samui Island and Pa-ngan Island) and Prachuap Khiri Kan. It is reported that the total areas hit by the coconut beetle outbreaks amounted to 7 229 hectares.

In order to address the issue, the Department of Agriculture and Department of Agricultural Extension are rearing biological control agents such as *Asecodes hispinarum* for control of this pest.
http://www.ento.csiro.au/aicn/name_s/b_726.htm
http://www.fao.org/docrep/007/ad522e/ad522e00.htm

***Heteropsylla cubana* Crawford**

Other scientific names: *Heteropsylla incisa* (Sulc.)
Hemiptera: Psyllidae
Common names: Leucaena psyllid
Host type: broadleaf
Hosts: *Leucaena* spp.; *Leucaena leucocephala*; *Albizia* spp.; *Mimosa* spp.; *Samanea saman*

Heteropsylla cubana is a significant pest of *Leucaena leucocephala* in several regions of the world. It is native to Central and South America but has spread to Africa, Asia and the Pacific. *H. cubana* feeds on young growth and occasionally older growth and flowers. It causes dieback of terminal shoots and stunting. At times the damage can lead to defoliation and death of plants.
http://www.cifor.cgiar.org/publications/pdf_files/Insect-pests.pdf
http://www.forestpests.org/subject.html?SUB=307
http://www.ento.csiro.au/aicn/name_s/b_1961.htm
http://www.afae.org/html/98-201.html
http://www.deh.gov.au/cgi-bin/abrs/fauna/details.pl?pstrVol=PSYLLOIDEA;pstrTaxa=105;pstrChecklistMode=2

Diseases

Indigenous diseases

***Botryosphaeria dothidea* (Moug.) Ces. & De Not. (1863)**

Other scientific names: *Caumadothis dothidea*; *Dothiorella mali*; *Sphaeria dothidea*
Ascomycota: Botryosphaeriaceae
Common names: Botryosphaeria canker
Host type: broadleaf
Hosts: *Eucalyptus* spp.; *E. camaldulensis*; *Casuarina equisetifolia*; *Acacia auriculiformis*

Canker disease caused by *Botryosphaeria dothidea* has a wide host range of woody plants in Thailand, including *Eucalyptus camaldulensis*, *Casuarina equisetifolia* and *Acacia auriculiformis*. The fungus is an opportunistic pathogen that manifests itself under conditions of environmental stress, typically attacking trees that have been stressed by

drought, late frosts, cold winds, hot winds, insect damage or pruning. The infection often leads to discolouration of the wood, which can extend throughout the tree, and can also lead to the development of cankers on stems and branches. Stems and branches often break at the site of the cankers.

In *E. camaldulensis* plantations in Phattana Nikhom, Lopburi province, *B. dothidea* infection causes development of stem canker and top dieback.
http://www.dnp.go.th/foremic/fmo/fmoproject/IUFRONair.pdf
http://www.forestryimages.org/browse/bimages.cfm?SUB=545&area=13
http://www.fabinet.up.ac.za/pdfs/tpcp-pamphlets/botryosphaeria.pdf

***Cryptosporiopsis eucalypti* Sankaran & B. Sutton**

Other scientific names:
Ascomycota: Dermateaceae
Common names: Cryptosporiopsis leaf and shoot blight
Host type: broadleaf
Hosts: *Eucalyptus* spp.; *E. camaldulensis*; *E. urophylla*

Leaf and shoot blight caused by *Cryptosporiopsis eucalypti* is one of the most important diseases in eucalypt plantations. This species occurs commonly in *E. camaldulensis* and *E. urophylla* plantations in Thailand.

Symptoms of *C. eucalypti* infection develop on both leaves and shoots of eucalypts. Leaf spots occur on both sides of the leaves and vary in size, shape and colour, within and between *Eucalyptus* species. Terminal shoots of young trees can be totally defoliated and are commonly blighted.

Cryptosporiopsis eucalypti can exist as a canker pathogen in woody stem tissue, so that inoculum persists during dry months when conditions are not favourable for leaf and shoot blight. During the onset of epidemic disease, leaf spots develop and affected leaves are eventually shed. The most damaging phase of the disease, however, is blight and dieback of terminal shoots.
http://www.dnp.go.th/foremic/fmo/fmoproject/IUFRONair.pdf
http://www.cifor.cgiar.org/publications/pdf_files/Books/eucalypts.pdf

***Cylindrocladium quinqueseptatum* Boedijn & Reitsma (1950)**

Other scientific names:
Ascomycota: Nectriaceae
Common names:
Host type: broadleaf
Hosts: *Eucalyptus* spp.; *E. camaldulensis*

Cylindrocladium quinqueseptatum infects many host plants in Southeast Asia and causes severe leaf blight disease of eucalypts. It is frequently noted on eucalypts in both nurseries and plantations in Thailand, but has not yet caused significant disease.
http://www.dnp.go.th/foremic/fmo/fmoproject/IUFRONair.pdf

***Nattrassia mangiferae* (Syd. & P. Syd.) B. Sutton & Dyko (1989)**

Other scientific names: *Dothiorella mangiferae* Syd. & P. Syd., 1916; *Exosporina fawcettii* E.E. Wilson [as 'fawcetti'], 1947; *Fusicoccum dimidiatum* (Penz.) D.F. Farr, 2005; *Fusicoccum eucalypti* Sousa da Câmara, 1929; *Hendersonula agathidis* H.E. Young [as *'agathi'*], 1948; *Hendersonula cypria* Nattrass, (1937); *Hendersonula toruloidea* Nattrass, 1933; *Neofusicoccum mangiferae* (Syd. & P. Syd.) Crous, Slippers & A.J.L. Phillips, 2006; *Neoscytalidium dimidiatum* (Penz.) Crous & Slippers, 2006; *Scytalidium dimidiatum* (Penz.) B. Sutton & Dyko, 1989; *Scytalidium lignicola* Pesante [as *'lignicolum'*], 1957; *Torula dimidiata* Penz., (1887)
Ascomycota: Incertae sedis
Common names:
Host type: broadleaf
Hosts: *Gmelina arborea*

N. mangiferae is known as a wound-invading pathogen of a variety of woody hosts in tropical and subtropical countries worldwide. In Thailand, it is often associated with attacks of *Tingis beesoni* on *Gmelina arborea*; the two agents contributing to the dieback and death of saplings (Nair, 2001).

***Subramanianospora vesiculosa* (E.J. Butler) C. Narayanan, J.K. Sharma & Minter, (2003)**

Other scientific names:
Ascomycota: Incertae sedis
Common names: wilt bark disease; blister bark disease; *Casuarina* blister bark
Host type: broadleaf
Hosts: Casuarinaceae; *Casuarina equisitfolia*

Wilt or blister bark disease is a destructive disease of *Casuarina equisitfolia* caused by the fungus, *Subramanianospora vesiculosa.* Discolouration of the foliage is the initial symptom of blister bark disease. As the disease advances, necrotic lesions appear all over the main stem and branches. Subsequently, all the affected trees exhibit symptoms of wilting and drying and are ultimately killed. Likely pathways of introduction and spread include nursery stock and bark and wood packaging material, including dunnage.
http://www.indexfungorum.org/Names/NamesRecord.asp?RecordID=487950
http://www.padil.gov.au/viewPestDiagnosticImages.aspx?id=519
http://www.daff.gov.au/content/output.cfm?ObjectID=D2C48F86-BA1A-11A1-A2200060A1B01742

Introduced diseases

***Chrysoporthe cubensis* (Bruner) Gryzenhout & M.J.Wingfield**

Other scientific names:
Ascomycota: Incertae sedis
Common names: Eucalyptus canker
Host type: broadleaf
Hosts: *Eucalyptus* spp.; *Syzgium aromactium*; *Tibouchina* spp.

Chrysoporthe cubensis is a fungus that is widespread and causes disease in commerical plantations of *Eucalyptus* spp. This fungus occurs naturally on native Myrtaceae and the original host is thought to be cloves (*Syzgium aromactium*). It is now found on other species of Myrtaceae including *Eucalyptus* spp. It causes cankers which lead to breakages of limbs and trunks of trees and often mortality. Subsequent growth is stunted and distorted. *C. cubensis* is known to kill significant numbers of eucalypts, particularly those in young plantations.
http://www.fao.org/docrep/006/p3565e/p3565e05.htm
http://www.forestryimages.org/browse/bimages.cfm?SUB=3486&area=47
http://fabinet.up.ac.za/personnel/docs/2004Gryzenhout_Studies_In_Mycology.pdf
http://fabinet.up.ac.za/tpcp/pamphlets/pdf/cryphonectria.pdf
http://fabinet.up.ac.za/personnel/docs/Rodas_Miconia.pdf
http://www.findarticles.com/p/articles/mi_qa4019/is_200105/ai_n8946157#continue
http://www.cbs.knaw.nl/publications/sim/sim50/50-11.pdf
http://www.cbs.knaw.nl/simonline/sim-050/50-11.pdf

***Coniothyrium zuluense* M.J. Wingf., Crous & T.A. Cout.**

Other scientific names:
Ascomycota: Incertae sedis
Common names: Eucalyptus canker; Coniothyrium stem canker
Host type: broadleaf
Hosts: *Eucalyptus* spp.

Coniothyrium zuluense was first described in South Africa and later found in Thailand (2002) and Mexico. Infection initially causes necrotic spots on stems and branches which develop into large girdling cankers that reduce wood quality and may lead to tree death. Copious amounts of red/brown gum exude from the lesions.

C. zuluense is considered a severe disease of eucalyptus forests and a limiting factor to tree propagation, but data is lacking on its impact in Thailand.
http://www.eppo.org/QUARANTINE/Alert_List/deleted%20files/fungi/Coniothyrium_zuluense.doc
http://www.cifor.cgiar.org/publications/pdf_files/Books/eucalypts.pdf
http://www.padil.gov.au/viewPest.aspx?id=580
http://www.iufro.org/download/file/1365/2718/diseases-stem-canker.pdf

Other pests

Indigenous other pests

No information was available on indigenous other pests (e.g. mites, nematodes, mammals, etc.) impacting the planted forests of Thailand.

Introduced other pests

No information was available on introduced other pests (e.g. mites, nematodes, mammals, etc.) impacting the planted forests of Thailand.

Diebacks and other conditions

No records were available for diebacks and other conditions affecting Thailand's planted forests.

Capacity for forest health protection

Government level

The Royal Forest Department (RFD) was founded in 1896 to take in charge of forest management, which enabled the central government to look after all logging. In 2002, with the "Restructuring of Ministries and Departments Act", the RFD was split into three departments under the Ministry of Natural Resources and Environment: the Royal Forest Department; the National Park Wildlife and Plant Conservation Department; and the Coastal and Marine Resources Department, which Mangrove, Peat Swamp and Wetland Division (Mangrove Forest Cluster) from the RFD has been annexed.

The five key goals for the Royal Forest Department are:

- protection of the remaining natural forest;
- forest rehabilitation and forest plantation extension;
- reduction of forest and land resource utilization conflict;
- enhancement of management effectiveness;
- forest research development and extension.

The Forest Research Office of the RFD has two groups specifically addressing forest health issues – the Forest Insects Group and the Forest Pathology and Microbiology Research Group. There are also three regional Insect Research and Control Centres at Lampang, Khon Kaen, and Chanthaburi.

Monitoring and detection

No specific information was available on monitoring and detection activities in Thailand.

Data management

No specific information was available on data management activities in Thailand.

Pest management

No specific information was available on pest management activities in Thailand.

Private landowners

No specific information was available on private landowners and their forest health protection activities in Thailand.

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Sharma, J.K. & Varma, R.V. eds. *Impact of diseases and insect pests in tropical forests.* Proceedings of the IUFRO Symposium, Peechi, India, 23-26 November 1993, pp.392-397.

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OSN = Other Scientific Name (other names, synonyms, other combinations, etc. that have been used for this species)