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OVERVIEW OF FOREST PESTS

INDONESIA

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DISCLAIMER

The aim of this document is to give an overview of the forest pest[1] situation in Indonesia. 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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INDONESIA

Introduction

Indonesia's forest cover in 2005 was estimated at 88 million hectares or 49 percent of total land cover (FAO, 2006). Principal tree species include *Shorea* spp., *Beilshiemedia* spp., *Dipterocarpus* spp., *Eugenia* spp., *Terminalia* spp., *Palaquium* spp., and *Dysoxyllum* spp. (FAO, 2006).

Planted forests cover almost 3.4 million hectares of the country representing 3.8 percent of the total forest area (FAO, 2006). Planted forest species include teak, *Acacia mangium*, *Eucalyptus* spp., *Gmelina arborea* and *Paraserianthes falcataria* (Nair, 2000).

Forest pests

Naturally regenerating forests

Insects

Indigenous insects

***Achaea janata* (Linnaeus, 1758)**

Other scientific names: *Catocala traversii*; *Noctua tigrina*; *Ophiusa ekeikei*; *Ophiusa melicerta*; *Phalaena melicerta*; *Achaea melicerta*; *Ophiusa janata*; *Phalaena janata*; *Phalaena melicerta*
Lepidoptera: Noctuidae
Common names: castor semilooper; castor oil looper; croton caterpillar
Host type: broadleaf
Hosts: *Excoecaria agallocha*; *Ricinus communis*; *Vigna unguiculata*; *Lycopersicon* spp.; *Brassica* spp.; *Capsicum annuum*; *Rosa* spp.

Achaea janata occurs throughout tropical and subtropical Asia and the Pacific. Host species include a wide range of plants including mangroves (*Excoecaria agallocha*), caster oil plant (*Ricinus communis*), cowpea (*Vigna unguiculata*), tomatoes (*Lycopersicon* spp.), *Brassica* spp., chili pepper (*Capsicum annuum*), and rose (*Rosa* spp.). At times there are outbreaks of this species that cause complete defoliation of some mangrove species which has a significant detrimental affect on the trees. It pupates either on the ground among fallen leaves and other debris or on the host plant within dead leaves.
http://www.extento.hawaii.edu/kbase/crop/Type/achaea.htm
http://www.cifor.cgiar.org/publications/ pdf_files/Insect-pests.pdf

***Achaea serva* (Fabricius, 1775)**

Other scientific names: *Noctua serva*; *Achaea fuscosuffusa*; *Achaea fasciculipes*; *Ophiusa serva*
Lepidoptera: Noctuidae
Common names:

Host type: broadleaf
Hosts: *Palaquium* spp.; *Excoecaria agallocha*

Achaea serva is a leaf-feeding caterpillar that is known to have a wide range of hosts including mangroves (*Eccoecaria aglallocha*) and *Palaquium*. It can cause severe defoliation of trees that it infests.
http://www.cifor.cgiar.org/publications/ pdf_files/Insect-pests.pdf

Agrilus kalshoveni

Other scientific names:
Coleoptera: Buprestidae
Common names: jewel beetle
Host type: broadleaf
Hosts: *Actinophora fragrans*

The larvae of *Agrilus kalshoveni* feed on *Actinophora fragrans*. This borer causes significant damage to the timber of the trees it attacks, which lowers the value of the timber produced even if the trees are not killed. Occasionally it causes wide scale, but patchy death of trees of all ages.

***Eumeta variegata* (Snellen)**

Other scientific names: *Clania variegata*
Lepidoptera: Psychidae
Common names: larger bagworm; giant bagworm
Host type: broadleaf and conifer
Hosts: *Pinus* spp.; *Bischofia javanica*; *Paulownia tomentosa*; *Acacia nilotica*

The giant bagworm larvae feed on the foliage and young shoots of many species of plants including *Pinus* spp., *Bischofia javanica*, *Paulownia tomentosa* and *Acacia nilotica*. Individuals of the bagworm create a silken case with their head exposed soon after hatching. They remain within the bag until they pupate; as they grow they enlarge the bag, discarding older material and incorporating newer bits of twigs and leaves. The adult females continue to inhabit the bags as adults, whereas the males are winged and capable of flight.

This species has caused significant defoliation of pines in naturally regenerating forests in northern Sumatra as well as damaged crop trees such as *Paulownia tomentosa* and *Acacia nilotica*.
http://www.cifor.cgiar.org/publications/pdf_files/Insect-pests.pdf
http://www.ias.ac.in/currsci/dec252003/1674.pdf

***Lymantria lepcha* Moore**

Other scientific names: *Porthetria lepcha*; *Barhona carneola*; *Lymantria galinara*
Lepidoptera: Lymantriidae
Common names:
Host type: broadleaf
Hosts: *Shorea* spp.; *Sonneratia acida*

The caterpillars of *Lymantria lepcha* are leaf feeders and feed on a variety of plants including *Shorea* spp. (Dipterocarpaceae) and the mangrove, *Sonneratia acida* (Sonneratiaceae). From time to time there are outbreaks of this caterpillar that cause significant damage.
http://www.mothsofborneo.com/part-5/lymantriini/Lymantriini_1_2.php
http://www.cifor.cgiar.org/publications/ pdf_files/Insect-pests.pdf

***Milionia basalis* Walker**

Other scientific names: *Milionia zonea*; *Milionia guentheri*; *Milionia latifasciata*; *Milionia pyrozonis*; *Milionia butteri*; *Milionia sharpie*; *Milionia pryeri*; *Milionia ochracea*
Lepidoptera: Geometridae
Common names: day flying moth
Host type: broadleaf and conifer
Hosts: *Pinus merkusii*; *Dacrydium* spp.; *Podocarpus* spp.

This is a species of brightly coloured day flying moth. It feeds on the leaves of plants and attacks a range of plant species including *Pinus merkusii, Dacrydium* spp. and *Podocarpus* spp. Oviposition is on the foliage of the host plant. The larva has a prominent orange head and anal region, the rest of the body is bluish black with two broad lateral bands of orange and several dorsal and ventral white longitudinal lines that interact with reticulate transverse boxes of white on each segment, resembling Chinese characters. The spiracles appear as dark dots within the orange bands. The mature larva lowers itself on a thread from the tree to the ground where it pupates about 5 cm deep in the soil. It is known to be a pest in both natural and planted forests. Repeated outbreaks have been recorded in northern Sumatra.
http://www.mothsofborneo.com/part-11/Boarmiini/boarmiini_1_1.php

Voracia casuariniphaga

Other scientific names:
Lepidoptera: Lasiocampidae
Common names:
Host type: broadleaf and conifer
Hosts: *Pinus merkusii*; *Casuarina junghuhniana*

Voracia casuariniphaga is native to Indonesia and feeds on the foliage of *Pinus merkusii*. It is found in the eastern Tenngar Mountains, Java. Occasional and severe outbreaks occur in naturally regenerating forests of *Casuarina junghuhniana* in eastern Java.
http://www.cifor.cgiar.org/publications/pdf_files/Insect-pests.pdf

Introduced insects

No information was available on introduced insects in the naturally regenerating forests of Indonesia.

Diseases

Indigenous diseases

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

Introduced diseases

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

Other pests

Indigenous other pests

No information was available on indigenous other pests (e.g. mites, nematodes, mammals, etc.) of the naturally regenerating forests of Indonesia.

Introduced other pests

No information was available on introduced other pests (e.g. mites, nematodes, mammals, etc.) of the naturally regenerating forests of Indonesia.

Diebacks and other conditions

No records were available for diebacks and other conditions affecting Indonesia's naturally regenerating forests.

Planted forests

Insects

Indigenous insects

***Aulacaspis marina* Takagi and Williams, 1998**

Other scientific names:
Hemiptera: Diaspidae
Common names: scale insect
Host type: broadleaf
Hosts: *Rhizophora mucronata*; *Rhizophora apiculata*; *Bruguiera gymnorrhiza*

The scale insect, *Aulacaspis marina*, has been known to kill a large number of mangrove (*Rhizophora mucronata*) saplings planted in Indonesia. Feeding of large numbers of this insect on the trees can result in leaf death. Other species of mangrove susceptible to this pest include *Rhizophora apiculata* and *Bruguiera gymnorrhiza*.The generation time of this species is between 34 and 42 days. There are up to 10 generations of this scale per year. Several consecutive generations will occur on the one tree. *A. marina* can kill seedlings within several months of initial infestation.
http://www.select.biosis.org/cgi-bin/CitedRef.cgi?doc_id=2121506

***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 believed to be endemice to Indonesia and Papua New Guinea and has been accidentally introduced into other Asia and the Pacific countries. From 1919 to 1934, this pest was found in only five provinces in Indonesia but is now widespread and considered one of the major forest pests, particularly of coconut palms, throughout the country (Nakamura, Konishi and Takasu, 2006). 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.

Different tactics were used for controlling the pest, but most of them rely heavily on the use of insecticides. Biological control by using natural enemies such as parasitoids and pathogens has proven to be promising methods to control plant pests. There are three potential natural enemies currently being investigated for controlling *B. longissima*: the pupal parasitoid, *Tetrastichus brontispa*; and the entomopathogenic fungi, *Metarhizium anisopliae* var. *anisopliae* and *Beauveria bassiana* (Hosang, Alouw and Novarianto, 2004; Nakamura, Konishi and Takasu, 2006).
http://www.ento.csiro.au/aicn/name_s/b_726.htm
http://www.fao.org/docrep/007/ad522e/ad522e00.htm

***Calliteara cerigoides* (Walker, 1862)**

Other scientific names: *Janassa cerigoides*
Lepidoptera: Lymantriidae
Common names: hairy caterpillar
Host type: broadleaf
Hosts: *Shorea* spp.; *Hopea* spp.; *Eucalyptus* spp.

Calliteara cerigoides larvae live and feed in the upper parts of trees. One of the ways that this insect is detected is by the presence of feces and cast larval skins on the forest floor. This is a polyphagous defoliator of Dipterocarpaceae and is known to feed on *Shorea* spp. and *Hopea* spp. It has also been recorded from *Eucalyptus* spp. There are distribution records of this moth from southern India, Burma, Sundaland and Sulawesi.
http://www.mothsofborneo.com/part-5/orgyiini/Orgyiini_5_2.php

***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

***Dioryctria rubella* Hampson, 1901**

Other scientific names:
Lepidoptera: Pyralidae
Common names: Tusam pitch moth; pine shoot moth
Host type: conifer
Hosts: *Pinus* spp.; *P. merkusii*

The larvae of pine shoot moth feeds on the shoots of trees. Female moths lay eggs on new growth. The larvae tunnel into the tips of the new growth. The larval feeding results in a distortion of new growth hence affecting growth rates and the quality of timber produced. The feeding can cause serious damage and dieback of the tips. The larval tunnel extends up to 30 cm into the tips. This species is known to feed on several species of pine. In some areas, the pine moth is considered one of the most damaging pests of *Pinus merkusii* plantations affecting thousands of hectares of young planted forests.
http://www.cifor.cgiar.org/publications/pdf_files/Books/Nair.pdf
http://www.biology.ualberta.ca/faculty/felix_sperling/uploads/pdfs/Du_et_al_Doc.pdf
http://www.cifor.cgiar.org/publications/pdf_files/Insect-pests.pdf

***Eurema blanda* (Boisduval, 1836)**

Other scientific names:
Lepidoptera: Pieridae
Common names: yellow butterfly; three spot yellow
Host type: broadleaf
Hosts: *Albizia* spp.; *Paraserianthes falcataria*

The adults of this insect are small yellow butterflies. The larvae of *Eurema blanda* can be serious defoliators of several species of plants including *Albizia* spp. and *Paraserianthes falcataria*. Outbreaks of this butterfly occur from time to time. *E. blanda* populations fluctuate widely, decreasing in the dry season and increasing in the rainy season, sometimes resulting in total destruction of the foliage in planted forests.
http://www.cifor.cgiar.org/publications/pdf_files/Insect-pests.pdf
http://www.geocities.com/RainForest/Vines/2382/pieridae/blanda.htm

Euwallacea destruens

Other scientific names: *Xyleborus destruens*; *Xyleborus pseudobarbatus*; *Xyleborus nandarivatus*; *Xyleborus tonkinensis*; *Xyleborus barbatulus*; *Xyleborus barbatus*
Coleoptera: Scolytidae
Common names: ambrosia beetle
Host type: broadleaf
Hosts: *Araucaria* spp.; *Casuarina* spp.; *Tectona grandis*; *Theobroma cacao*; *Swietenia macrophylla*; *Pometia pinnata*

Euwallacea destruens attacks a wide range of plants including *Araucaria* spp., *Casuarinas* spp., *Tectona grandis*, *Theobroma cacao*, *Swietenia macrophylla*, and *Pometia pinnata*. Adult ambrosia beetles bore into trees and inoculate them with fungi. The larvae then feed on the fungus by tunnelling under the bark. Frequently the same tree is attacked by several consecutive generations of beetles that can cause stress on the trees.
http://www.cabicompendium.org/FC/datasheet.asp?CCODE=XYLBDE&COUNTRY=0

***Euwallacea fornicatus* (Eichhoff, 1868)**

Other scientific names: *Xyleborus fornicatior*; *Xyleborus perbrevis*; *Xyleborus schultzei*; *Xyleborus tapatapaoensis*; *Xyleborus whitfordiodendrus*; *Xyleborus fornicatus*
Coleoptera: Scolytidae
Common names: shot hole borer; tea shot hole borer
Host type: broadleaf
Hosts: *Persea americana*; *Theobroma cacao*; *Durio zibethinus*; *Gmelina arborea*; *Falcataria moluccana*; *Bauhinia variegata*; *Camellia sinensis*; *Senna siamea*; *Casuarina equisetifolia*; *Chlorophora excelsa*; *Citrus* spp.; *Erythrina subumbrans*; *Gliricidia sepium*; *Grevillea robusta*; *Hevea brasiliensis*; *Populus* spp.; *Tectona grandis*; *Terminalia catappa*

Euwallacea fornicatus has a very wide range of hosts. Adults bore into the heartwood of host tree trunks and larger branches and then inoculate the galleries with fungus. When the fungus starts to grow, the females lay eggs and the larvae feed on the fungus when they hatch from the eggs. The boring of the adults can lead to weakening of branches and breakage and can provide entry points for secondary invasives.
http://www.crees.org/plantprotection/AubWeb/bugweb/bugroot.htm
http://www.xyleborini.tamu.edu/query.php?tax_id=586

Helopeltis theivora

Other scientific names: *Helopeltis febriculosa*; *Helopeltis oryx*; *Helopeltis theobromae*; *Helopeltis theivora theobromae*; *Afropeltis theivora*
Hemiptera: Miridae
Common names: mosquito tea bug; mosquito bug; tea bug; tea mosquito
Host type: broadleaf
Hosts: *Camellia* spp.; *Anacardia* spp.; *Acacia mangium*; *Theobroma cacao*; *Capsicum* spp.; *Cinnamomum camphora*

Helopeltis theivora feeds on a wide range of plants including tea (*Camellia* spp.), cashews (*Anacardia* spp.), *Acacia mangium*, cocoa (*Theobroma cacao*), pepper (*Capsicum* spp.) and camphor (*Cinnamomum camphora*) and causes considerable

damage. It tends to feed on new shoots and fruit. It often causes fruit to drop and new shoots to die. Feeding wounds provide entry points for secondary invaders. Successive attacks on new growth can lead to stunting and death of young trees.
http://www.cabicompendium.org/NamesLists/CPC/Full/HELOTH.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: *Avicennia* spp.; *Callicarpa* spp.; *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*. 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.cifor.cgiar.org/publications/pdf_files/Books/Nair.pdf
http://www.cifor.cgiar.org/publications/pdf_files/Insect-pests.pdf

***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: *Khaya* spp.; *Cedrella* spp.; *Toona ciliata*; *Tectona grandis*; *Swietenia macrophylla*

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 cilata*, *Cedrella* spp. and *Tectona* spp. 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://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 quadrinotata* (Walker, 1856)**

Other scientific names: *Squamura quadrinotata*; *Arbela quadrinotata*; *Lepidarbela quadrinotata*; *Cossus abruptus*; *Cossus quadrinotata*; *Cossus tesselatus*; *Zeuzera pardicolor*
Lepidoptera: Cossidae
Common names: bark caterpillar
Host type: broadleaf
Hosts: *Paraserianthes falcataria*; *Casuarina* spp.; *Acacia* spp.; *Albizia* spp.; *Anacardium occidentale*; *Pongamia pinnata*

Indarbela quadrinotata is a polyphagous insect that feeds on a range of trees including *Paraserianthes falcataria*, *Casuarina* spp., *Acacia* spp., *Albizia* spp., *Anacardium occidentale* and *Pongamia pinnata*. The larvae form a shelter by making a hole in the wood of trees where the side branches meet the main branch. They form a collar of webbing and feces from which they emerge to feed on the bark of the tree. One generation takes approximately 8 months. Heavy infestations cause significant damage to the bark of trees as well as lowering the quality of the timber. The tunnelling causes weak points on the trees where breakages can occur. The damage causes a reduction in growth rate of the trees as well as providing entry points for secondary infestations by other insects or plant pathogens.
http://www.metla.fi/iufro/iufro95abs/d2pap106.htm
http://www.cabicompendium.org/NamesLists/FC/Full/SQUAQU.htm
http://internt.nhm.ac.uk/jdsml/research-curation/projects/butmoth/GenusDetails.dsml?NUMBER=14651.0

***Milionia basalis* Walker, 1854**

Other scientific names: *Milionia butteri*; *Milionia guentheri*; *Milionia latifasciata*; *Milionia ochracea*; *Milionia pryeri*; *Milionia pyrozonis*; *Milionia sharpie*; *Milionia zonea*
Lepidoptera: Geometridae
Common names: day flying moth
Host type: broadleaf and conifer
Hosts: *Pinus merkusii*; *Dacrydium* spp.; *Podocarpus* spp.

Milionia basalis, a species of brightly coloured black and red, day flying moth. The larvae of this moth feed on several plants species including *Pinus merkusii, Dacrydium* spp. and *Podocarpus* spp. Feeding on the foliage can be very significant. Oviposition is on the foliage of the host plant. They pupate in the soil. It is known to be a pest in both natural and planted forests. The larva has an orange head and anal region with a bluish black body and two broad lateral bands of orange and several dorsal and ventral white longitudinal lines and dark spiracles in the orange areas.
http://www.mothsofborneo.com/part-11/Boarmiini/boarmiini_1_1.php

***Neotermes tectonae* (Dammerman, 1915)**

Other scientific names:
Isoptera: Kalotermitidae
Common names: termite; inger-inger
Host type: broadleaf
Hosts: *Tectona grandis*

This species of dry wood termite attacks *Tectona grandis*, particularly trees older than three years. Symptoms of attack only become evident several years after the initial infestation. The termite hollows out stems and branches and causes swelling of branches and trunks. It is a serious problem in some areas and causes significant loss in the value of timber produced from planted forests.
http://www.cifor.cgiar.org/publications/pdf_files/Insect-pests.pdf

***Pteroma plagiophleps* Hampson**

Other scientific names:
Lepidoptera: Psychidae
Common names: bag worm
Host type: broadleaf
Hosts: *Acacia mangium*; *Paraseriathes falcataria*

Pteroma plagiophleps attacks a wide range of plants including *Acacia mangium* and *Paraseriathes falcataria.* Individuals of the bagworm create a silken case with their head exposed soon after hatching. They remain within the bag until they pupate; as they grow they enlarge the bag, discarding older material and incorporating newer bits of twigs and leaves. There are two holes in the bag, one at the front for feeding and one at the rear to eject waste. They cause defoliation, which at times can be severe.
http://www.metla.fi/julkaisut/workingpapers/2005/mwp011-07.pdf
http://www.fzi.uni-freiburg.de/InsectPestKey-long%20version/pindefol.htm
http://www.ias.ac.in/currsci/jun102002/1322.pdf

***Valanga nigricornis* (Burmeister)**

Other scientific names:*Acridium nigricorne*; *Cyrtacanthacris melanocornis*; *Cyrtacanthacris nigricornis*; *Orthocanthacris nigricornis*; *Valanga melanocornis*
Orthoptera: Acrididae
Common names: grasshopper; Javanese grasshopper; saffron grasshopper; shorthorned grasshopper; valanga grasshopper
Host type: broadleaf
Hosts: *Acacia mangium*; *Elaeis* spp.; *Oryza* spp.; Fabaceae

This species of grasshopper feeds on a wide range of plants including *Acacia mangium*, oil palms (*Elaeis* spp.), rice (*Oryza* spp.) and groundnuts (Fabaceae spp.). Normally it is not a significant pest however populations of this species sporadically build to high numbers causing significant damage.
http://www.pestinfo.org/Literature/litout.php3

***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.mothsofborneo.com/part-1/cossidae/cossidae-4-4.php

***Xylosandrus morigerus* (Blandford, 1894)**

Other scientific names: *Xyleborus coffeae* Wurth; *Xyleborus luzonicus* Eggers; *Xyleborus morigerus* Blandford; *Xylosandrus coffeae*; *Xyleborus difficilis*
Coleoptera: Scolytidae
Common names: Scolytid beetle; brown coffee borer; brown twig borer
Host type: broadleaf
Hosts: *Camellia* spp.; *Coffea* spp.; *Albizia* spp.; *Crotalaria* spp.; *Leucaena* spp.; *Persea americana*; *Tectona grandis*; *Theobroma cacao*; *Swietenia macrophylla*

Xylosandrus morigerus is typically a secondary stem borer of a wide range of host plants with stems 1-3 cm in diameter and that have been damaged or are otherwise weakened. However, it may also be responsible for primary attacks on healthy trees and seedlings. This species occurs throughout Asia and in areas of Australia, Africa, Europe, the Pacific Islands, Central America, South America and the USA.
http://www.cabicompendium.org/NamesLists/FC/Full/XYLSMO.htm
http://www.xyleborini.tamu.edu/query.php?tax_id=1738

***Xystrocera festiva* Thomson, 1861**

Other scientific names:
Coleoptera: Cerambycidae
Common names: stem borer
Host type: broadleaf
Hosts: *Acacia mangium*; *Paraserianthes falcataria; Albizia* spp.; *Coffea* spp.; *Pithecolobium* spp., *Theobroma* spp.

This cerambycid is a large beetle with metalic green stripes down each side. It affects a wide range of trees, in particular leguminous trees including *Acacia mangium, Albizia* spp., *Coffea* spp., *Pithecolobium* spp., *Theobroma* spp. and *Paraserianthes falcataria*. It bores into large branches and trunks of trees causing losses in the value of the timber, weakening of trunks and limbs, as well as providing opportunities for secondary invasives. In some areas it has a detrimental impact on the establishment of single host species plantations.

***Zeuzera coffeae* Nietner, 1861**

Other scientific names: *Zeuzera oblita*
Lepidoptera: Cossidae
Common names: red borer; cocoa pod borer; cocoa stem 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

***Heteropsylla cubana* Crawford**

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

Heteropsylla cubana is a significant pest of *Leucaena leucocephala* in several regions of the world. It also infests other *Leucaena* spp., *Samanea saman*, *Mimosa* spp. and *Albizia* spp. This psyllid is a sap-sucker that feeds on young growth and occasionally older growth and flowers. It causes dieback of terminal shoots and stunting. At times the damage it causes can lead to defoliation and death of the plants. It is native to Central and South America but has spread to Africa, Asia and the Pacific.
http://www.cifor.cgiar.org/publications/pdf_files/Insect-pests.pdf
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
http://www.ento.csiro.au/aicn/name_s/b_1961.htm
http://www.forestpests.org/subject.html?SUB=307

Diseases

Indigenous diseases

Agrobacterium tumefaciens

Other scientific names: *Achromobacter radiobacter*; *Agrobacterium radiobacter*; *Alcaligenes radiobacter*; *Bacillus radiobacter*; *Bacterium radiobacter*; *Bacterium tumefaciens*; *Phytomonas radiobacter*; *Pseudomonas tumefaciens*
Rhizobiales: Rhizobiaceae
Common names: crown gall
Host type: broadleaf
Hosts: *Populus* spp.; Dipterocarpaceae

Crown gall is a common, widely distributed disease. Infected plants grow galls on stems, branches, trunks and roots of plants. This bacterium can persist in the soil for several years after an infected plant has been removed. The bacteria are introduced into plants via wounds caused by insect feeding, egg deposition by insects and pruning of plants. The galls affect the vigour of plants thus making them more susceptible to other pests and diseases. Eradicating the bacteria from plants is very difficult to impossible. This disease is one of several diseases that cause significant damage to poplars in China and is a significant disease of Dipterocarpaceae in Indonesia.
http://www.ipm.iastate.edu/ipm/hortnews/1995/5-19-1995/cgall.html

***Corticium salmonicolor* Berk. & Broome, 1873**

Other scientific names: *Erythricium salmonicolor*; *Aleurodiscus javanicus*; *Botryobasidium salmonicolor*; *Corticium javanicum*; *Corticium zimmermannii*; *Necator decretus*; *Pellicularia salmonicolor*; *Terana salmonicolor*
Basidiomycota: Corticiaceae
Common names: pink disease; pink limb blight
Host type: broadleaf
Hosts: *Acacia mangium*; *Agathis dammara*; *Mangifera* spp.; *Citrus* spp.; *Eucalyptus* spp.

Corticium salmonicolor invades the bark on branches of mature trees. Branches and trunks of infected trees become covered by fungal threads and then pustules develop followed by a whitish-pink crust. Under favourable environmental conditions this disease can have a high infection rate and cause considerable damage including galls and dieback. It has a wide host range including *Acacia mangium*, *Agathis dammara*, mango, citrus and eucalypts. Possible pathways for entry of the disease are via infected plants, timber and timber packaging. It is a waterborne and airborne fungus.
http://www.fftc.agnet.org/library/article/bc52009.html
http://www.indexfungorum.org/Names/namesrecord.asp?RecordID=103294
http://www.indexfungorum.org/Names/SynSpecies.asp?RecordID=159976

***Entoleuca mammata* (Wahlenb.) J.D. Rogers & Y.M. Ju**

Other scientific names: *Sphaeria mammata*; *Hypoxylon mammatum*; *Nemania mammata*; *Sphaeria pruinata*; *Rosellinia pruinata*; *Hypoxylon pauperatum*; *Anthostoma morsei*; *Hypoxylon morsei*; *Hypoxylon blakei*; *Anthostoma blakei*; *Hypoxylon holwayi*
Ascomycota: Xylariaceae
Common names: black stem canker
Host type: broadleaf

Hosts: *Acacia mangium*; *Populus* spp.; *Acer* spp.; *Alnus* spp.

Entoleuca mammata has been associated with black stem canker in *Acacia mangium*, and cankers in species of *Populus*, *Acer* and *Alnus*. It appears to attack either trees growing in poor conditions, stressed trees or dying trees. It enters via wounds caused by insect feeding or pruning. The disease caused by this fungus is capable of killing trees in some instances. There is some degree of variability in the susceptibility of individual plants to the fungus.
http://www.indexfungorum.org/Names/GSDSpecies.asp?RecordID=415807
http://pyrenomycetes.free.fr/entoleuca/html/Entoleuca_mammata.htm

***Ganoderma philippii* (Bres. & Henn. ex Sacc.) Bres.**

Other scientific names: *Ganoderma pseudoferreum*; *Fomes philippii*; *Fomes pseudoferreus*
Basidiomycota: Ganodermataceae
Common names: red root rot
Host type: broadleaf
Hosts: *Artocarpus* spp.; *Arenga* spp.; *Camellia sinensis*; *Coffea* spp.; *Melia azedarach*; *Syzygium aromaticum*; *Theobroma cacao*; *Acacia mangium*

Ganoderma philippii is a red root rot that affects a wide range of hosts including *Artocarpus* spp., *Arenga* spp., *Camellia sinensis*, *Coffea* spp., *Melia azedarach*, *Syzygium aromaticum*, *Theobroma cacao* and *Acacia mangium*. In some areas it is considered a serious disease, particularly in plantations of *Acacia mangium* where it has been known to cause as much as 20 percent mortality. The frequency of disease is higher where trees have been replanted in areas that were previously infected. The pathogens survive on woody materials (roots and stumps) left in the ground after removal of previously diseased plants. The symptoms of the disease include leaves that turn pale green and are much smaller in size and fewer in number. There is a reduced rate of growth and young shoots may wilt.
http://www.fao.org/documents/show_cdr.asp?url_file=/docrep/007/y5507e/y5507e10.htm
http://www.indexfungorum.org/Names/SynSpecies.asp?RecordID=314321

***Phellinus noxius* (Corner) G. Cunn.**

Other scientific names: *Fomes noxius*; *Phellinidium noxium*
Basidiomycota: Hymenochaetaceae
Common names: heart rot; brown root; collar rot
Host type: broadleaf
Hosts: *Albizia* spp.; *Araucaria* spp.; *Artocarpus* spp.; *Bauhinia* spp.; *Cassia* spp.; *Camellia* spp.; *Elaeis* spp.; *Coffea* spp.; *Eucalyptus* spp.; *Persea americana*; *Acacia mangium*; *Theobroma cacao*

This species of fungus affects a wide range of plants including *Albizia* spp., *Araucaria* spp., *Artocarpus* spp., *Bauhinia* spp., *Cassia* spp., tea (*Camellia* spp.), oil palm (*Elaeis* spp.), *Coffea* spp, *Eucalyptus* spp., *Persea americana*, *Acacia mangium* and *Theobroma cacao*. It is known to be associated with heart rot, collar rot and root disease in Asia and the Pacific. Symptoms include brown fungal fruiting bodies with a white margin, cracked

bark through which gum oozes, roots that are encrusted with mycelium-covered soil, leaf loss and branch dieback. Fruiting bodies may form several years after the death of the host plant. Infections can start from airborne spores, damaged branches or root contact.
http://www.indexfungorum.org/Names/SynSpecies.asp?RecordID=336255
http://www.cifor.cgiar.org/publications/pdf_files/Insect-pests.pdf

***Phytophthora palmivora* (E.J. Bulter) E.J.Bulter**

Other scientific names:
Oomycota: Pythiaceae
Common names: black canker; bud rot; fruit rot
Host type: broadleaf
Hosts: *Acacia mangium*; *Artocarpus altilis*; *Theobroma cacao*; *Cocos nucifera*; *Hevea* spp.; *Capsicum* spp.; *Carica papaya*; *Durio* spp.; *Citrus* spp.

With a circumtropical distribution, this fungus has a broad host range including *Acacia mangium*, breadfruit, cocoa, coconut, rubber, pepper, pawpaws, durian and citrus. This species affects hosts in various ways - some have the fruit, buds and meristem affected whereas others experience leaf mortality and/or stem cankers. This fungus is spread by rain splash of soil borne inoculum, insects, pruning tools and possibly rats. Entry into a plant may be via wounds caused by insects.
http://www.indexfungorum.org/Names/SynSpecies.asp?RecordID=194605
http://www.cifor.cgiar.org/publications/pdf_files/Insect-pests.pdf

Poria hypobrunnea

Other scientific names:
Basidiomycota: Polyporaceae
Common names: stem canker; heart rot
Host type: broadleaf
Hosts: *Camellia sinensis*; *Acacia mangium*

Poria hypobrunnea is the causal agent of heart rot, stem canker and root rot in various plants including *Camellia sinensis* (tea) and *Acacia mangium*. This fungus gains entry via wounds in branches. In some plant species it spreads slowly from the point of entry to the main stem or trunk and then to the roots. It often kills branches as the disease progresses. The spread of the disease is slow and can cause mortality in plants several years after initial infection.
http://www.indexfungorum.org/Names/SynSpecies.asp?RecordID=230164
http://www.dtrdc.org/dmanagement.htm
http://www.cifor.cgiar.org/publications/pdf_files/Insect-pests.pdf

***Tinctoporellus epimiltinus* (Berk. & Broome) Ryvarden**

Other scientific names: *Diplomitoporus epimiltinus*; *Fomes epimiltinus*; *Physisporinus borbonicus*; *Polyporus epimiltinus*; *Poria borbonica*; *Poria cinereicolor*; *Poria epimiltina*; *Tyromyces inconsideratus*
Basidiomycota: Polyporaceae
Common names: heart rot

Host type: broadleaf
Hosts: *Acacia mangium*

Tinctoporellus epimiltinus is one of the causal agents of heart rot in several tree species including *Acacia mangium*. It causes the heartwood to become soft and fibrous. The effect on the productivity of the tree is not readily seen. At times, less than one percent of the timber within a tree is affected. However if the value of the timber is high or the end use is for construction purposes the significance of the infection is greater. Infections are thought to be initiated from wounds caused, for example, by pruning or insect feeding.
http://www.indexfungorum.org/Names/SynSpecies.asp?RecordID=324633
http://www.aciar.gov.au/web.nsf/att/JFRN-6BN9AE/$file/tr51e.pdf
http://www.cifor.cgiar.org/publications/pdf_files/Insect-pests.pdf

Introduced diseases

Atelocauda digitata

Other scientific names: *Ontotelium digitatum*; *Pileolaria phyllodiorum*; *Racospermyces digitatus*; *Uromyces phyllodiae*; *Uromyces phyllodiorum*
Basidiomycota: Pileolariaceae
Common names: rust; phyllode rust
Host type: broadleaf
Hosts: *Acacia* spp.

In planted forests, *Atelocauda digitata* causes severe damage to foliage, young stems and seed pods resulting in deformation of the foliage, defoliation and reduced growth. The spores are airborne. In naturally occurring plants this fungus does not appear to be important. This fungus is native to Hawaii but occurs in Asia, Australia and New Zealand. Host plant species are *Acacia* species including *Acacia mangium*.
http://www.cifor.cgiar.org/publications/pdf_files/Insect-pests.pdf
http://www.fao.org/documents/show_cdr.asp?url_file=/docrep/007/y5507e/y5507e10.htm
http://www.botany.hawaii.edu/faculty/gardner/rusts/Acacia%20koa/atelocauda_digitata.htm

Other pests

Indigenous other pests

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

Introduced other pests

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

Diebacks and other conditions

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

Capacity for forest health protection

Government level

In Indonesia, all forest lands are owned by the government. Forest management, planning, inventory and assessment functions are carried out by the Ministry of Forestry. Capacity to address protection of Indonesia's forest pest problems is limited. Forest protection research is conducted at the Forestry and Estate Crops Research and Development Agency (FERDA), two universities in Java, three in Kalimantan, one in Sulwawesi and one in Sumatra.

Monitoring and detection

Monitoring and detection of forest pests is an informal process and limited in scope. With the exception of Java, most planted forests are located in remote areas, long distances from where experts in forest protection are located and there are limited travel and camping facilities to carry out monitoring or research studies.

Although some estimates of forest area infested by insects and diseases are available, Nair (2000) indicates that there is an immediate need to establish a planted forest health monitoring system for Indonesia covering pests and diseases as well as plantation failures due to other causes.

Data management

Virtually all data on insects and diseases that affect Indonesia's forests is qualitative in nature. A large number of reviews describing or listing problems characterizes Indonesian forest protection research literature. Most of this material has been presented in seminars and conferences that are organized with external support.

A database and expertise in the identification of insects and pathogens causing disease is needed because many of the causative organisms have, to date, been inadequately identified to species level.

Pest management

A variety of fungicides are used for disease control in nurseries. Plantations of *Paraserianthes falcata* are protected from the stem borer, *Xystrocera festiva*, by cutting infested trees during regular thinning operations carried out at 3, 4, 5 and 6 years of age. This has reduced infestation rates to between 4-10 percent of the trees.

Private landowners

While private forest landowners do not exist in Indonesia, some private plantation companies that have concessions to establish plantings on government owned lands have organized research units that monitor and study forest pest and disease problems and collaborate with universities.

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