Notes on

Insects damaging wood

in South-Western Australia

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o/head - ①

Insect species recorded in association with wood/timber in South-Western Australia (1986).

Order	Family	No. of species	
Coleoptera	Lymexylidae (Pinhole borers)	2	
	Cerambycidae (Longhorn beetles)	32	
	Buprestidae (jewel beetles)	6	
	Scolytidae (Ips & Ambrosia beetle)	5	(4 definitely introduced)
	Curculionidae (Weevils)	4	
	Lyctidae	1	(introduced)
	Bostrychidae	4	(incl.? 1 introduced)
	Anobiidae	2	(introduced)
		Eg. 56 of 80 spp. are beetles.	
Lepidoptera	Cossidae	1	
Isoptera	Kalotermitidae	4	} 23 spp.
	Rhinotermitidae	5	
	Termitidae	14	
		80 species	

O/head → start or finish - both.
-② a last.

SUMMARY

Common name	Taxonomy	Injurious part of life cycle	Target of attack	Known host tree species
Pinhole borer (2spp)	Beetle (Lymexylid)	larva	1 c,sw,hw	JKYWBT
Bardi/Phorancantha (3spp)	Beetle (Cerambycid)	larva	1 c,sw,hw	JMTUQSVT
Bullseye Borer (Tryphocaria) (3spp)	Beetle (Cerambycid)	larva	1 c,sw,hw	JMKTYWAFQV
Jewel Beetle (many species)	Beetle (Buprestid)	larva	1 c,sw	many species - Mallee's W/belt.
*Ips (Ips grandicollis)	Beetle (Scolytid)	adult	1 c	Pr, Pp
*Ambrosia Beetle (Xyleborus saxeseni) sax-S-Enye	Beetle (Scolytid)	adult	1 sw	Pr, Pp, fruit trees
Gregarious Gall Weevil (Strongylorhinus ochraceus) O-cray-sus	Beetle (Curculionid)	larva	1 sw	KTR +
*Powder Post Beetle (Lyctus brunneus) brun-nie-us	Beetle (lyctid)	larva	3 sw	many hardwoods
Jesuit, Auger or Shothole Beetle	Beetle (Bostrychid)	adult + larva	2 sw	JM + many hardwoods
*Furniture Beetle (Anobium punctatum)	Beetle (Anobiid)	larva	3 sw, hw	usually pines
*Bark anobiid (Ernobium mollis)	Beetle (Anobiid)	larva	3 sw	pines with bark present
Wood Moth (Xyleutes sp.)	Moth (Cossid)	larva	1 sw, hw	K
Termite	(Isoptera)	workers	1,2or3 sw,hw	many species
Two species have not yet established in WA				
*Sirex Woodwasp (Sirex noctilio) knock-till-E-O Sy-ricid	Wasp (Siricid)	larva	1 sw	pines
*European House Borer (Hylotrupes bajulus)	Beetle (Cerambycid)	larva	3 sw	pines

1 = pest of living tree, freshly felled log, or green timber; does not reinfest dry wood
2 = pest of moist and partly dry wood
3 = pest of dry seasoned wood (reinfestation occurs)
C = cambium, sw = sapwood, hw = heartwood
Abbreviations of tree species: J = jarrah, K = karri, M = marri, R = E. rudis
Y = E. patens, W = Wandoo, T = tuart, B = E. astringens
A = E. jacksonii, F = E. ficifolia, Q = E. resinifera,
S = E. microcorys, V = E. saligna, Pr = Pinus radiata,
Pp = P. pinaster U = E. globulus
* = Introduced since European settlement.

A-tract-O-serious

1/ Atractocerus kreuslerae (Pinhole borer). Indigenous to S.W. and S. Australia. Adult beetle is up to 30mm long.

Life cycle: Eggs are laid on bare or injured timber of 9 eucalypts. The larva bores into the tree where it spends 2 years feeding. Adults emerge from December to February through 'pinholes' (<1mm in diameter).

Damage: Degraded heartwood. In the early days of forestry when hewing was widespread, this insect was considered a major pest. It is now regarded as a minor nuisance. Structural weakening of timber is unlikely.

Control: Not studied.

2/ Phoracantha semipunctata. Indigenous to eastern and southern Australia, including Tasmania. Introduced to S. Africa, New Zealand, S. America and Medit. area. Adult beetle is 16-30mm long.

Life cycle: Eggs are laid from December to April on logs and dead or moribund stems of 8 eucalypts. For most of the year the larvae feed between bark and sapwood but the last larval stage (up to 32mm long) bores deep into the heartwood, where it pupates. Adults emerge from December to April.

Damage: Galleries degrade timber, but the insect is more of a pest in eucalypt plantations outside Australia. Unlikely to cause structural damage. A piece of scantling timber showing longicorn attack will not be a hazard to other timbers in the structure as these will be partially dry and therefore immune from infestation. Exit holes average 8 x 4mm.

Control:

3/ Tryphocaria acanthocera (Bullseye borer). Indigenous to southern Australia. Adult beetle is 30-45mm long.

Life cycle: Eggs are laid in December/January on the bark of living trees of 11 eucalypts. On hatching, the larva eats through the bark and sapwood into the heartwood. When fully grown (up to 70mm long), it bores through the sapwood and excavates an ear-shaped chamber between heartwood and bark. It then tunnels in April/May of the following year into the heartwood where it pupates in October/November. The entrance behind the larvae is plugged with gum. Adult beetles emerge in December/January.

Damage: In jarrah, kino develops where a gallery intersects the cambium. In karri, up to 8 different galleries may occur along the bole. Both features degrade the value of timber for sawmilling. Galleries are 12 x 4mm in cross section.

Control: Not studied.

4/ Diadoxus erythrurus (Cypress Pine jewel beetle). Indigenous to Australia.
Adult beetle 13mm long.

Life Cycle: Adults are active from November to April. Eggs are laid on fire scars or in crevices in the bark of unhealthy trees of Callitris spp. and introduced Cupressus spp. Larvae feed on the phloem tissues adjacent to the sapwood, and often pupate in the heartwood. The life cycle is probably 12 months.

Damage: Larvae etch the outer surface of the sapwood. Exit holes are oval, c. 3 x 2mm in cross-section. Sawn timber is not re-infested.

Control: Not studied.

5/ Ips grandicollis (Southern Pine Engraver, American Bark Beetle). Introd. from N. America. Adult beetle is 2.5 - 4.5mm log.

Life Cycle: The male beetle bores through the bark of pine, usually after felling, and attracts the female. She lays eggs in the walls of the galleries (underneath the bark). Young beetles emerge through small holes (2mm diameter) in the bark. During summer, the life cycle is only about 6 weeks. Between September and May there may be 5 - 6 generations.

Damage: The tunnels do not seriously degrade timber, but the fungus introduced stains the wood. In S.W. Australia, this insect is a problem only in unthinned plantations, particularly in drought years.

Control: Silvicultural - Thinning and prescribed fire to remove slash. Since 1984 predatory insects and parasitoids bred in S. Australia have been released at Gnangara.

6/ Xyleborus saxeseni (Ambrosia beetle). Europe, Asia, N. Africa, N. America. Introduced to New Zealand and Australia. Adult beetle 3mm long.

Life Cycle: Adults are recorded between September and May but are most active in October and November. Males are small and flightless, so mating takes place within the galleries. The female bores c. 4cm into wood, lays her eggs, introduces the fungal spores and eventually dies in situ. Larvae extend the gallery made by the female. Populations overwinter within the galleries.

Damage: This species bores into the heartwood of felled logs, cyclone-damaged or fire-damaged unhealthy trees, and dead trees of many species. It has been recorded damaging radiata pine boards at Harvey. The galleries are straight and their walls are darkly stained by fungus. Tunnels lack frass. Exit holes < 1mm in cross section.

In New Zealand, adults attack radiata pine logs one week after felling, and infestation of conifers is confined to the main stem and larger branches.

Control: A moisture content in wood > 40% is necessary to support the ambrosia fungus on which the larvae and adults feed. Once the wood dries it becomes uninhabitable. Hence seasoning and sawmill hygiene will control this insect.

7/ Wood -25 -32 -34 Strongylorhinus ochraceus (Gregarious gall weevil). Indigenous to Australia. Adult beetle 10mm long.

Life Cycle: Adults are active in Spring. Eggs are laid in small holes made by the female in the bark. Larvae tunnel into sapwood resulting in swelling of tissue (galls). Life cycle c. 12 months.

Damage: Galls formed by the larval galleries cause breakage of branches. Eucalyptus rudis seems to be the tree most affected in the southwest.

Control: Not studied.

8/ Wood -26 Lyctus brunneus (Powder Post beetle). Indigenous to Europe, now cosmopolitan. Adult beetle up to 7mm long.

Life Cycle: Adults are active in October and November and feed on the surface of wood by gnawing torn fibres. Eggs are laid to a depth of 5mm within the vessels of wood with high starch content (the food of the larva) and with pores large enough to receive the ovipositor. The life cycle lasts from 2 - 12 months depending on temperature. Females oviposit within 24 hr of emergence.

Damage: No evidence of infestation is visible on the surface of the wood until the flight holes (1.5mm in cross section) are made by the emerging adult beetles. The frass is like fine talcum powder. Reinfestation occurs in dry wood (moisture content 10 - 20%). Heartwood is never infested. Structural weakening can be caused only to scantling with a large content of sapwood.

Control: Any preservative that does not penetrate susceptible timber at least 5mm will not prevent attack. Avoid including any sapwood in sawn timber by not milling logs from immature trees. Kiln drying does not prevent attack. Karri, wandoo and jarrah are normally immune to infestation.

No specimen 9/ + 10/. Bostrychid (Auger) beetles.
Bostrychopsis jesuita adult beetle to 20mm long (introduced)
Xylopsocus rubidus adult beetle to 6mm long (indigenous)

Adult - 33 Life Cycle: The female bores into the timber and makes the galleries in which eggs are laid. The wood that she has chewed is expelled as a coarse dust. The larvae then create a network of tunnels in the sapwood.

Adults are attracted to freshly-felled, dying or suppressed trees and freshly sawn timber. These beetles can therefore occur in the forest, timber yards or houses.
The life cycle lasts one year.

Damage: The larvae infest sapwood with a moisture content of 20-35%. Dry timber is not attacked, so it is unusual for more than one generation to breed in the same piece of timber.
There are no fungal stains in the larval galleries.

The neat, circular entry/exit holes range from 3 to 6mm in diameter, depending on the species of beetle involved.

Control: Remove sapwood. Season the timber. Note: The female beetle sometimes will bore into preservative treated wood, but will soon die from eating the poisoned starch in the wood.

Not in U.K. 10/ Anobium punctatum (Furniture beetle, Woodworm) Indigenous to Europe. Now cosmopolitan. Adult beetle 4mm long.

Life cycle: Eggs are laid in cracks in the wood surface and hatch within 4-5 weeks. The larva then tunnels into the wood and eventually honeycombs it. Adults emerge in summer. The life cycle lasts 1-3 years.

Damage: Infests wood that is old and thoroughly dry, and not just furniture.
Galleries do not have fungal staining. The exit holes are c. 1.5mm in cross section. Frass is ellipsoidal, and feels like fine sand.
Damp, humid conditions seem to be preferred : floors in houses with poor ventilation beneath may be severely attacked.

Control: Remove sapwood. Treat timber with preservative. Eucalypts are not attacked.

Wood - 2% 12/ Ernobius mollis (Pine bark anobiid). Indigenous to Europe, now cosmopolitan. Adult beetles up to 5mm long.

Life cycle: Adults are active in Spring and Summer. Eggs are laid in crevices or under loose pieces of bark. Larvae bore through to the cambium where they make irregular tunnels. These leave an engraving on the inner bark surface and surface of the wood. - slide
The life cycle lasts 9 months.

Damage: Only pines are attacked, but only if bark is still attached. Dead branches on trees, felled logs or dry timber are all susceptible; living trees and green timber are not attacked.
Flight holes are c. 2mm in cross section.

Control: Remove bark from logs or sawn timber.

12/ Xyleutes sp. (Wood Moth). Indigenous to Western Australia. Adult moth is 70mm long, with wingspan up to 170mm. – slide ①

Wood - 28 29

Life cycle: No data, probably two years.

Damage: Living trees (karri) are attacked by the larvae (caterpillars), degrading the heartwood. The cross sectional dimensions of the galleries are 25 x 15mm. – slide ②

Control: Not studied.

14/ Coptotermes acinaciformes and other species (termites). Indigenous. Up to 5mm long.

Evergore has seen termite damage.

Life cycle: Termites are social insects, nesting within living trees. This is usually evidenced by clay workings around the base. The queen produces all eggs, which develop into one of three castes: worker (wingless, sterile, blind), soldier (ditto) and reproductive. Alates (potential kings and queens) fly from the nest ("swarm") in early November.
Nests are likely to be occupied for many years.

Damage: Only the worker eats timber. Living trees are attacked only after having been damaged by fungus or fire.

Control: Prevent fire or mechanical damage to crop trees in the forest. In buildings, destroy nests with insecticide or poison.

15/ Sirex noctilio (Sirex Woodwasp). slide ① Introduced from Europe to New Zealand and thence to Tasmania, Victoria, South Australia and NSW. Adult wasp is 25-30m long. – ♂ – orange band – slide ①

Wood - 30
Adult - 31

Life cycle: Eggs are laid from November to April in the sapwood of physiologically-stressed radiata pine. The larvae tunnel inwards and then up or down, and later pupate in sapwood. The adult bores out of the tree through a circular hole (4-7mm diameter). – slide ②
The life cycle lasts 1 year.

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o/head ②

Damage: During oviposition the spores of a wood-rotting fungus are introduced. This fungus spreads through the cambial layer and ringbarks the tree. Timber is degraded by the larval tunnels and exit holes of the adults.

Control: Quarantine. Has not yet established in W.A. Parasitoids and nematodes have been successfully tried in Victoria.

o/head.

Not in W.A. 16/ Hylotrupes bajulus (European house borer). Indigenous to Europe, where originally a forest inhabitant but now a common domestic pest. Introduced to the Eastern States but apparently not established; not yet present in Western Australia. Adult beetle 7-25mm long.

Life cycle: Eggs are laid in cracks and crevices in wood and hatch in c. 14 days. Larvae attain a length of 20-30mm over about 4 years, sometimes exceeding 20 years (depending on moisture content of timber).

o/head.

Damage: Several authorities acknowledge that this insect is the 'world's most destructive pest of seasoned softwood'. The sapwood is tunelled by the larvae first but heartwood is not immune from injury. Damage superficially resembles that caused by Lyctus in hardwoods in that the sapwood is completely powdered beneath a thin skin of apparently sound wood. Exit holes are oval and average 6-9mm in cross section.

o/head.

In South Africa both pinaster and radiata pine are frequently attacked.
When this species infests a roof, the first sign of its presence is the collapse of the infested structure.

Control Effective quarantine of imported softwood timbers. Pretreatment with CCA of timber to be used for structural purposes. In the Eastern States fumigation with methyl bromide apparently eliminated the known infestations.

QUESTIONS

1. In your opinion, which is the most destructive wood-boring insect present in Western Australia? Justify your answer.

2. Neither Sirex nor Hylotrupes is present in Western Australia. In your opinion which would have most impact in Western Australia? Justify your answer.

3. Enumerate the known insect borers of karri.

4. Enumerate the insect borers of pine in Western Australia.

5. A member of the public produces a piece of wood infested with insects. Describe the features that you would look for in order to identify the type of borer.