This text is an integral part of the *EPPO Study on bark and ambrosia beetles associated with imported non-coniferous wood* and should be read in conjunction with the study

Pest information sheet
Ambrosia beetle

EUPLATYPUS PARALLELUS (COLEOPTERA: PLATYPODINAE)

EPPO Lists: Not listed. The assessment of potential risks in this information sheet is not based on a full PRA for the EPPO region, but on an assessment of the limited information for that species used to prepare the information sheet.

PEST OVERVIEW

Taxonomy

Euplatypus parallelus (Fabricius, 1801). Synonyms: *Platypus parallelus, P. linearis, P. poeyi, P. subcostatus, P. dejeani, P. marseuli, P. proximus, P. compressus, P. regularis, P. rugulosis, P. reticulates, P. rotundatus, P. kratzii, P. lebasi, P. emarginatus, P. congoanus, P. triquetrus, P. mattai, P. difficillis, P. erichsoni, P. laevicollis, P. macklini, P. oblongus, P. praevius, P. puntulatus. P. subaequalis, P. wesmaeli, Bostrichus parallelus* (Atkinson, 2018).

Associated fungi

No information was found on the symbionts of *E. parallelus*. *E. parallelus* was found to transmit *Fusarium* wilt fungi, although normally not as a primary vector. In Asia and the Seychelles, an association has been noted for several leguminous tree species (e.g. *Pterocarpus indicus*, *Dalbergia sissoo*) between the presence of *Fusarium oxysporum* attacks by *E. parallelus*, and the subsequent death of the trees. However, the details of the interactions between stress factors, pathogen and beetle attacks, and whether *E. parallelus* acts as a vector, are not clear (Beaver, 2013, citing others). On *Pterocarpus indicus* in Indonesia, fungi in the genera *Aspergillus*, *Penicillium*, *Trichoderma*, *Fusarium*, *Acremonium*, *Gliocladium*, *Saccharomyces* and *Candida* were found associated (Tarno *et al.*, 2016). In Thailand, Bumrungsri *et al.* (2008) found 46 fungi associated with frass, sapwood, wood resin and larvae and adults. *Fusarium* spp. including *F. oxysporum* and *F. solani* were the dominant sporulating fungi, and were not found associated with adults. *E. parallelus* may help the movement of *Fusarium* spp. in the wood within its galleries.

Morphology and biology

Adults measure ca. 4 mm (Maruthadurai *et al*., 2013). No detailed study of the biology of *E. parallelus* was found, but its life cycle is typical of many Platypodinae, which complete most of their life cycle in the wood of their host, and feed on symbiotic fungi farmed in their tunnels. The gallery system is started by the male and continued by the female after mating (Beaver, 2013, citing others). Galleries may reach the heartwood of rubber trees with a large trunk diameter (da Silva, 2013).

E. parallelus tends to attack large logs or trunks but can also breed in smaller stems down to about 10 cm diameter (Beaver *et al.*, 2013). It is also reported on branches of some hosts (e.g. *Anacardium occidentale* in Maruthadurai *et al.*, 2013; *Pterocarpum indicum* in Tarno *et al.*, 2014).

E. parallelus is known to attack trees that recently died or dying trees, as well as living trees that have been stressed by fire, drought, pathogens or other causes, and occasionally apparently healthy trees, possibly in relation to high population levels leading to mass attacks (Bumrungsri *et al.*, 2008).

Spread biology

No specific information was found, but both males and females disperse (Beaver *et al.*, 2013), and could fly.

Nature of the damage
Damage is caused by the adults boring galleries that may extend deeply into the wood, and by pathogenic fungi introduced into the galleries (Gümüs and Ergün, 2015, citing others). Galleries create technical damage to the wood (holes surrounded by a blackened area caused by the ambrosia fungi) (Beaver *et al.*, 2013).

Detection and identification

- *Symptoms.* There may be entry holes on the trunk and branches, as well as powdery frass or strings of compacted sawdust on and at the base of the trees (Maruthadurai *et al.*, 2013). On *Pterocarpus indicus*, with a pathogenic fungus associated, other symptoms were fallen leaves, wilting and dying of trees (Tarno *et al.*, 2016).
- *Trapping.* Atkinson (2018) mentions trapping with ethanol as well as various light traps.
- *Identification.* Taxonomic keys by Atkinson (1989) and Wood (1993) can be used for the morphological identification of *E. parallelus* (Li *et al.*, 2018, citing others). The complete mitochondrial genome of *E. parallelus* is given in Yang *et al.* (2017).

Distribution (see Table 1)
E. parallelus is native to South and Central America and is present in the South of the USA (California, Texas and Florida) (Wood and Bright, 1992). It has been introduced into Africa, Asia and Oceania. In Asia, it was first recorded in Sri Lanka in the 1970s and is now present almost throughout East Asia (Beaver *et al.*, 2013 citing others). It was most recently recorded in India (Maruthadurai *et al.*, 2013) and China (Hainan Island) (Li, 2018).

No records of presence were found in the EPPO region. Several publications refer to the presence of the species in England (e.g. Atkinson, 2018; Allen, 1976; Whitehead, 2001), though it is probable that the few findings were casual importees, which never established populations (Whitehead, 2001). *E. parallelus* is considered absent in the UK Risk Register (2018). In France, it was trapped in 2016 in La Rochelle harbour (Denux *et al.*, 2017; GEFF, 2017), but is not established (L-M Nageleisen and T. Noblecourt, pers. comm. 2018-05).

Host plants (see Table 2)
E. parallelus is highly polyphagous without any preference for particular families of trees (Beaver, 2013, citing others). A list of 65 host species in 21 families was published in 1965 for the Afrotropical region, and many others have been recorded in other areas, including both non-coniferous and coniferous trees (Bumsrungsri *et al.*, 2008, citing Schedl, 1965, Zanuncio *et al.* 2002; 2005). Table 2, which is not complete and prepared from only a few publications, covers hosts in 29 families, with 9 genera of Fabaceae. *E. parallelus* has attacked new hosts in new areas. The host range covers mostly tropical and subtropical plants (including major tropical woods such as teak, sapele, meranti), which in the EPPO region may be cultivated as ornamentals. *Persea americana* is cultivated commercially in the Southern part of the EPPO region, as well as *Mangifera indica* to a more limited extent (Spain). *Eucalyptus* spp. are also cultivated commercially and as amenity trees in the southern part of the region. Finally, *Quercus* and *Pinus*, widespread in EPPO, are mentioned among the hosts, but host species were not specified in the respective sources.

Known impacts and control in current distribution
Although it is mentioned in several publications that *E. parallelus* is the most destructive Platypodinae in the world (e.g. Maruthadurai *et al.*, 2013), relatively few reports of damage were found over its entire range. *E. parallelus* is mostly a secondary pest, but primary attacks can occur (Bumrungsri *et al.*, 2008). Dense attacks, especially if combined with fungal attack, can kill trees, and mass attacks may kill stressed trees that might otherwise have survived (Beaver *et al.*, 2013, citing others). Impacts relate to decrease of the value of the wood following attacks on live trees or recently felled wood, decrease of production on fruit trees, and death of trees, especially where *E. parallelus* has a role in transmitting *Fusarium* wilt fungi.

Regarding damage to live trees, *E. parallelus* is found in natural environments in the Americas, but attacks in plantations have also been observed: in Brazil, on fire-stressed *Pinus* sp. (Zanuncio *et al.*, 2002), drought-stressed *Eucalyptus* hybrids (Zanuncio *et al.*, 2005), *Hevea brasiliensis* (da Silva *et al.*, 2013); in Colombia, on *Acacia mangium* (Medina and Florian, 2011). In Central America (especially Costa Rica but also others) and Brazil, *E. parallelus* is one of the wood borers attacking *Tectona grandis*, and that may cause loss of wood value due to the presence of galleries (Ferreira, 2016; Arguedas *et al.*, 2004; Arguedas and Solis, 2006; Arguedas *et al.*, 2015). In southern Thailand, it has caused damage to stressed mango and cashew trees (*Mangifera indica*, *Anacardium occidentale*) (Beaver *et al.*, 2013 citing others). In India, attacks on *Anacardium occidentale* were noted (Maruthadurai *et al.*, 2013), further damaging stressed trees and causing losses to producers.

In Asia and the Seychelles, mortality has been observed for several leguminous tree species (e.g. *Pterocarpus indicus*, *Dalbergia sissoo*) infested by both *Fusarium oxysporum* and *E. parallelus*, but the role of *E. parallelus* is not known (Beaver *et al.*, 2013 citing others). In Indonesia, *E. parallelus* was associated with mortality of roadside *Pterocarpus indicus*, and *Fusarium* was isolated (Tarno *et al.*, 2014, 2016). Also in Brazil, it was found associated with pathogenic fungi attacking *Hevea brasiliensis* (Beaver *et al.*, 2013 citing others).

E. parallelus can also cause economic damage by attacking felled trees, especially stems of large diameter, and freshly sawn timber. The presence of galleries reduces the quality and value of the wood, and of veneer produced from it (Beaver, 2013, citing others). *E. parallelus*, together with *Xyleborus affinis* was responsible for most of the damage caused to timber of 18 tree species in Amazonia, Brazil. In part of Thailand, *E. parallelus* was the dominant species attacking *Hevea brasiliensis* logs in piles, while attacks on sawn rubberwood timber were infrequent (Sittichaya and Beaver, 1999; Beaver *et al.*, 2013).

In the USA, where it occurs in Florida, California and Texas, Drooz *et al.* (1985) state that it causes minor damage as unfavourable climate prevents it from becoming abundant. Note that on *P. americana*, it was found emerging from wood, but no damage is reported (Carrillo *et al.*, 2012). No data were found on damage in other parts of the world (e.g. Africa and Oceania).

Control. No information has been found on control measures specific to *E. parallelus*.

POTENTIAL RISKS FOR THE EPPO REGION

Pathways

Entry

There are frequent mentions of association with wood in trade. *E. parallelus* was probably accidentally imported into Asia in timber or unseasoned wood after the Second World War, and is frequently intercepted in imported timber in Japan (Beaver *et al.*, 2013). In the Korean Republic, it was intercepted on *Shorea lepidota* (light red meranti; Choi *et al.*, 2003), and in China on logs from Sierra Leone (Yang *et al.*, 2017). In the EPPO region, it was intercepted in Turkey in logs of *Tetraberlinia bifoliata* from Cameroon (Gümüş and Ergün, 2015), and in Spain on wood of *Entandrophragma cylindricum* (sapele) from the Congo (EPPO, 2015). Finally, in the UK, it was intercepted on wood, most likely pine, in passenger baggage from a flight originating from Jamaica (UK Risk Register, unpublished background data); in addition few additional findings over time (Whitehead, 2001) are probably linked to imports.
Given its host range, *E. parallelus* is most likely to be associated with tropical wood, including teak, mahogany, sapele, meranti, shisham, rubberwood etc. In addition, it has occasionally attacked plantations of other trees that may be imported as wood, such as pine and eucalyptus in Brazil. As larvae survival decreases with drying, recently felled wood would be more suitable for survival. Processing applied to produce wood commodities would also destroy some individuals. The likelihood of entry on wood chips, hogwood and processing wood residues would be lower than on round wood as individuals would have to survive processing and transport, and transfer to a suitable host is less likely. Bark on its own is an unlikely pathway (life stages are in the wood).

Plants for planting or cut branches would be a pathway only if there are of a large size (a diameter >10 cm is mentioned). It is not known if plants for planting or cut branches of this size would be traded (except possibly Christmas trees).

Summary of pathways (uncertain pathways are marked with '?'):

- *wood (round or sawn, with or without bark, incl. firewood) of hosts*
- *wood packaging material if not treated according to ISPM 15*
- *wood chips, hogwood, processing wood residues (except sawdust and shavings)*
- *plants for planting (except seeds) of hosts?*
- *cut branches (incl. Christmas trees)?*

Because of the large and uncertain host range, pathways may cover all coniferous and non-coniferous species.

Spread (following introduction, i.e. within EPPO region)
E. parallelus would be able to spread naturally and through human-assisted pathway. Given its climatic requirements, the spread may be limited to part of the EPPO region. The success of new outbreaks would depend on whether it would be able to attack widespread trees in the EPPO region. If only the known hosts are attacked, spread would probably be limited. However, it is highly polyphagous and has been able to attack new hosts in new areas.

Establishment
E. parallelus is widely present in tropical and subtropical areas, including South America and Africa. It has spread within Asia for decades, but its northernmost limit is currently in Taiwan. Beaver *et al.* (2013, citing others) mention that it probably cannot survive and breed in the current climate of Japan's main islands. In North America, it is recorded in Florida, Texas and southern California, but the climate is considered unfavourable to building abundant populations (Drooz *et al.*, 1985). Based on the classification of Köppen-Geiger (see Annex 6 of the study), some climate types in USA States as well as Mexico (e.g. Cfa, Csa, Csb[1]) occur in the EPPO region around the Mediterranean Basin and eastwards to the Black Sea. It cannot be excluded that *E. parallelus* would be able to establish in the South of the EPPO region. Although Allen (1976) made the hypothesis that *E. parallelus* may occasionally form transient populations in the UK, it is not present in any oceanic temperate climate in its known range. Similarly, in France it was trapped in La Rochelle harbour, but is not established (see *Distribution*).
The current host range of *E. parallelus* consists mostly of tropical plants, but it has been able to attack new plant species in new locations (e.g. in Australia, see Table 2). Some known hosts may be grown mostly as ornamentals, and there is a certain presence of *Mangifera indica* in Spain and *Eucalyptus* in the southern part of EPPO. However, known hosts are not widespread in the EPPO region. *Quercus* and *Pinus* are mentioned among the hosts, but no details were found. Establishment would be facilitated if *E. parallelus* is able to attack new hosts at destination.

Potential impact (including consideration of host plants)
The potential impact would depend on whether *E. parallelus* would find new hosts in the EPPO region. In the USA where it is present in similar climates, it causes minor damage, and this would probably also be the case in the EPPO region. However, it would add to the ambrosia beetle fauna able to colonize live and recently felled trees with possible impact on wood value. One concern would be if it would become associated with pathogenic fungi and carry those into the trees, contributing to their spread and impact, as observed in other areas with *Fusarium oxysporum* that causes death of trees.

[1] **Cfa**: warm temperate climate, fully humid, hot summer; **Csa**: warm temperate climate, dry and hot summer; **Csb**: warm temperate climate, dry and warm summer

Table 1. Distribution

	Reference	**Comments**
EPPO region		
Absent: France	Denux *et al.*, 2017; GEFF, 2017	Trapped in La Rochelle harbour, not established
Absent: UK		England in mentioned in some sources (e.g. Atkinson, 2018). *E. parallelus* was found at a few occasions (see Allen 1976, Whitehead, 2001). It is probable that findings were casual importees, which never established populations (Whitehead, 2001). Considered absent in the UK Risk Register.
Africa		
Angola	Wood and Bright (1992)	
Cameroon	Wood and Bright (1992)	
Chad	Wood and Bright (1992)	
Congo	Wood and Bright (1992)	
Equatorial Guinea	Wood and Bright (1992)	
Fernando Po	Wood and Bright (1992)	
Gabon	Wood and Bright (1992)	
Ghana	Wood and Bright (1992)	
Guinea	Wood and Bright (1992)	
Ivory Coast	Wood and Bright (1992)	
Kenya	Wood and Bright (1992)	
Madagascar	Wood and Bright (1992)	
Nigeria	Wood and Bright (1992)	
Principe Island	Wood and Bright (1992)	
Sao Tome Island	Wood and Bright (1992)	
Senegal	Wood and Bright (1992)	
Seychelles	Beaver, 2013, citing others	
Sierra Leone	Wood and Bright (1992)	
South Africa	Wood and Bright (1992)	
Tanzania	Wood and Bright (1992)	
Togo	Wood and Bright (1992)	

	Reference	Comments
Uganda	Wood and Bright (1992)	
Zaire	Wood and Bright (1992)	
Uncertain records: Liberia	Atkinson, 2018	Considered uncertain here as unpublished
Asia		
Bangladesh	Beaver, 2013, citing others	
Brunei Darussalam	Beaver, 2013, citing others	
Cambodia	Beaver, 2013	
China (Hainan island)	Li (2018)	New record
India	Maruthadurai *et al.* 2013	
Indonesia	Beaver, 2013, and citing others	From 1980s (Beaver, 2013)
Malaysia	Beaver, 2013	From 1980 (Beaver, 2013)
Philippines	Beaver, 2013	
Singapore	Beaver, 2013	
Sri Lanka	Beaver, 2013, citing others	From 1970s (Beaver, 2013)
Taiwan	Beaver, 2013	
Thailand	Beaver, 2013, and citing others	From 1980s
Uncertain records: Myanmar, Vietnam	Beaver, 2013, citing others	Based on declared interceptions in China with timber
North America		
USA: - California, Florida - Texas - Hawaii	 Wood and Bright (1992) Atkinson and Riley, 2013 Gillet and Rubinoff, 2017	 - new record
Mexico	Wood and Bright (1992)	
Central America		
Belize	Wood and Bright (1992)	
Costa Rica	Wood and Bright (1992)	
El Salvador	Wood and Bright (1992)	
Guatemala	Wood and Bright (1992)	

	Reference	**Comments**
Honduras	Wood and Bright (1992)	
Nicaragua	Wood and Bright (1992)	
Panama	Wood and Bright (1992)	
Caribbean		
Cuba	Wood and Bright (1992)	
Dominican Republic	Wood and Bright (1992)	
Guadeloupe	Peck *et al.*, 2014	
Haiti	Wood and Bright (1992)	
Jamaica	Wood and Bright (1992)	
Puerto Rico	Wood and Bright (1992)	
Uncertain records: - Bahamas, Cayman Isl., Dominica, Santa Lucia, Trinidad and Tobago, Virgin Isl.	Atkinson, 2018	Considered uncertain here as unpublished
South America		Native (Beaver, 2013)
Argentina	Wood and Bright (1992)	
Bolivia	Wood and Bright (1992)	
Brazil	Wood and Bright (1992)	
Chile	Wood and Bright (1992)	
Colombia	Wood and Bright (1992)	
Ecuador	Wood and Bright (1992)	
French Guyana	Wood and Bright (1992)	as ‘Cayenne’
Guyana	Wood and Bright (1992)	
Paraguay	Wood and Bright (1992)	
Peru	Wood and Bright (1992)	
Suriname	Wood and Bright (1992)	
Uruguay	Wood and Bright (1992)	
Venezuela	Wood and Bright (1992)	
Oceania		
Australia (Queensland)	Bickerstaff (2017)	

	Reference	Comments
Borneo	Beaver, 2013, citing others	timber imported to Japan from Borneo Beaver, 2013, citing others
Papua New Guinea	Beaver, 2013	

Table 2. Hosts

Family	Genus/Species	Reference
Acanthaceae	*Avicennia*	Beaver, 2013, citing others
Anacardiaceae	*Anacardium occidentale*	Beaver *et al.*, 2013; Maruthadurai *et al.* 2013
Anacardiaceae	*Astronium graveolens*	Atkinson, 2018
Anacardiaceae	*Cedrela fissilis*	Schönherr and Pedrosa-Mac (1981) Brazil
Anacardiaceae	*Mangifera indica*	Atkinson, 2018
Anacardiaceae	*Metopium brownei*	Bright and Skidmore, 2002
Anacardiaceae	*Spondias purpurea*	Atkinson, 2018
Apocynaceae	*Aspidosperma megalocarpon*	Atkinson, 2018
Araucariaceae	*Araucaria angustifolia*	Schönherr and Pedrosa-Mac (1981) Brazil
Araucariaceae	*Araucaria cunninghamii*	Schedl (1979) Australia
Arecaceae	*Cocos nucifera*	Atkinson, 2018
Bignoniaceae	*Tabebuia*	Atkinson, 2018
Bombacaceae	*Ceiba aesculifolia*	Atkinson, 2018
Bombacaceae	*Ceiba*	Atkinson, 2018
Burseraceae	*Bursera*	Atkinson, 2018
Dipterocarpaceae	*Shorea lepidota*	From interception data, Choi *et al.*, 2003
Euphorbiaceae	*Croton*	Bright and Skidmore, 2002
Euphorbiaceae	*Croton nitens*	Atkinson, 2018
Euphorbiaceae	*Croton pseudoniveus*	Atkinson, 2018
Euphorbiaceae	*Hevea brasiliensis*	da Silva, 2013, Brazil; Bumrungsri *et al.*, 2008, citing others, Africa, Malaysia, India
Fabaceae	*Acrocarpus*	Atkinson, 2018
Fabaceae	*Caesalpinia ferrea*	Tarno *et al.*, 2014
Fabaceae	*Cassia*	Tarno *et al.*, 2014
Fabaceae	*Cassia javanica*	Gillet and Rubinoff, 2017, Hawaii
Fabaceae	*Colvillea racemosa*	Schedl (1979) Australia (Queensland)

Family	**Genus/Species**	**Reference**
Fabaceae	*Dalbergia sissoo*	Beaver *et al.*, 2013 citing others
Fabaceae	*Delonix regia*	Atkinson, 2018
Fabaceae	*Tetraberlinia bifoliata*	Interception data, Gümüs and Ergün, 2015
Fabaceae	*Erythrina brevifolia*	Atkinson, 2018
Fabaceae	*Lonchocarpus rugosus*	Bright and Skidmore, 2002
Fabaceae	*Lonchocarpus*	Atkinson, 2018
Fabaceae	*Pterocarpus indicus*	Bumrungsri *et al.*, 2008. Thailand
Fabaceae	*Pterocarpus rohrii*	Atkinson, 2018
Fagaceae	*Quercus*	Bright and Skidmore, 2002
Lamiaceae	*Tectona grandis*	Kirkendall and Ødegaard, 2007
Lamiaceae	*Gmelina arborea*	Bright and Skidmore, 2002
Lamiaceae	*Vitex guameri*	Atkinson, 2018
Lauraceae	*Persea americana*	Carrillo *et al.*, 2012
Lythraceae	*Sonneratia*	Beaver, 2013, citing others
Malvaceae	*Pterocymbium beccarii*	Schedl (1979) Australia (Queensland)
Meliaceae	*Carapa slateri*	Atkinson, 2018
Meliaceae	*Entandrophragma cylindricum*	Interception data, EPPO, 2015
Mimosaceae	*Acacia dolychostachya*	Atkinson, 2018
Mimosaceae	*Acacia guameri*	Atkinson, 2018
Mimosaceae	*Acacia mangium*	Bright and Skidmore, 2002
Mimosaceae	*Lysiloma bahamensis*	Atkinson, 2018
Moraceae	*Brosimum*	Bright and Skidmore, 2002
Moraceae	*Brosimum alicastrum*	Atkinson, 2018
Moraceae	*Cecropia obtusifolia*	Atkinson, 2018
Moraceae	*Ficus*	Bright and Skidmore, 2002
Moraceae	*Ficus cotinifolia*	Atkinson, 2018
Moraceae	*Ficus elastica*	Atkinson, 2018
Moraceae	*Ficus radulina*	Atkinson, 2018
Moraceae	*Ficus retusa nítida*	Atkinson, 2018

Family	Genus/Species	Reference
Myrtaceae	*Eucalyptus grandis* x *E. urophylla*	Beaver *et al.*, 2013 citing others
Nyctaginaceae	*Guapira*	Atkinson, 2018
Oleaceae	*Fraxinus uhdei*	Atkinson, 2018
Pinaceae	*Pinus*	Zanuncio *et al.*, 2002
Pinaceae	*Pinus oocarpa*	Atkinson, 2018
Polygonaceae	*Gymnopodium floribundum*	Atkinson, 2018
Proteaceae	*Macadamia*	Gillett and Rubinoff, 2017, Hawai
Sapindaceae	*Koelreuteria formanosa*	Atkinson, 2018
Sapindaceae	*Thouinidium decandrum*	Atkinson, 2018
Taxodiaceae	*Taxodium mucronatum*	Atkinson, 2018
Ulmaceae	*Celtis laevigata*	Atkinson, 2018
Vochysiaceae	*Qualea brevipedicellata*	Bright and Skidmore, 2002

References (all URLs were accessed in March 2018)

Allen AA. 1976. *Platypus parallelus* F. (=*linearis* Steph.) (Col.: Scolytidae) recaptured in Britain after 150 years. Entomologist's Record and Journal of Variation, 88, 57-58.

Allen AA. 1985. *Platypus parallelus* (F.) (Col., Scolytidae) again captured at light in S.E. London. Entomologist's Monthly Magazine, 121, 141.

Arguedas M, Chaverri P, Verjans J-M. 2004. Problemas fitosanitarios de la teca en Costa Rica. Recursos Naturales y Ambiente.

Arguedas M, Rodríguez M, Guevara M. 2015. Plagas Y Enfermedades En Plantaciones De Teca En Centroamérica. Conference. Guayaquil, Ecuador.

Atkinson TH, Riley EG. 2013. Atlas and checklist of the bark and ambrosia beetles of Texas and Oklahoma (Curculionidae: Scolytinae and Platypodinae). Insecta Mundi 3-22.

Atkinson TH. 2018. Bark and Ambrosia Beetles: http://www.barkbeetles.info

Beaver RA. 2013. The invasive neotropical Ambrosia beetle *Euplatypus parallelus* (Fabricius, 1801) in the Oriental region and its pests status (Coleopteral: Curculionidae, Platypodinae). Entomologist's Monthly Magazine, 149(1), 143-154.

Bickerstaff JRM. 2017. Morphological and Molecular Characterisation of Australian Pinhole Borers (Coleoptera: Curculionidae, Platypodinae). BSc thesis, GradDipConBio, Western Sydney University

Bright DE, Skidmore RE. 2002. A Catalog of Scolytidae and Platypodidae (Coleoptera).: Supplement 2 (1995-1999). National Research Council of Canada, NRC Research Press.

Bumrungsri S, Beaver R, Phongpaichit S, Sittichaya W. 2008. The infestation by an exotic ambrosia beetle, *Euplatypus parallelus* (F.) (Coleoptera: Curculionidae: Platypodinae) of Angsana trees (*Pterocarpus indicus* Willd.) in southern Thailand. Songklanakarin J. Sci. Technol. 30 (5), 579-582.

Carrillo D, Duncan RE, Peña JE. 2012. Ambrosia Beetles (Coleoptera: Curculionidae: Scolytinae) that Breed in Avocado Wood in Florida. Florida Entomologist, 95(3):573-579.

da Silva JCP, Putz P, Silveira EdC, Flechtmann CAH. 2013. Biological aspects of *Euplatypus parallelus* (F.) (Coleoptera, Curculionidae, Platypodinae) attacking Hevea brasiliensis (Willd. ex A. Juss.) in Sao Paulo Northwest, Brazil. III Congresso Brasileiro de Heveicultura – 24 a 26 de julho de 2013, Guarapari.

Denux O, Bernard A, Courtial B, Courtin C, Lorme P, Magnoux E, Phelut R, Pineau P, Robinet C, Roques A. 2017. Utilisation de pièges génériques pour la détection précoce d'insectes exotiques xylophages: focus sur les ports de Nouvelle – Aquitaine. http://draaf.nouvelle-aquitaine.agriculture.gouv.fr/IMG/pdf/Pour_diffusion_Denux_etal_2017_INRA_resultats_Portrap_et_ports_Aquitaine_cle0dfc13.pdf (accessed on 10 July 2018)

Drooz AT (ed). 1985. Insects of Eastern Forests. USDA. , Forest Service, 608 pp.

EPPO. 2015. EPPO report on notifications of non-compliance. EPPO Reporting Service no. 01 – 2015, Article 2015/012. Available at gd.eppo.int

Ferreira CSS. 2016. Diversidade De Curculionidae (Scolytinae, Platypodinae) E Bostrichidae Em Plantios De Teca, *Tectona grandis* L. F., 1782, No Estado Do Pará, Brasil. Thesis. Universidade Federal De São Carlos Centro De Ciências Agrárias Programa De Pós-Graduação Em Agroecologia E Desenvolvimento Rural.

GEFF. 2017. Newsletter. October 2017. Le Groupe des Entomologistes Forestiers Francophones en Savoie. Ministère de l'agriculture et de l'alimentation, France. Département de la Santé des Forêts.

Gillett CPDT, Rubinoff D. 2017. A Second Adventive Species of Pinhole-borer on the Islands of Oahu and Hawaii (Coleoptera: Curculionidae: Platypodinae). Proceedings of the Hawaiian Entomological Society, 49:51–57.

Gümüş EM, Ergün A. 2015. Report of a pest risk analysis for *Platypus parallelus* (Fabricus, 1801) for Turkey. Bulletin OEPP/EPPO Bulletin, 45 (1):112–118.

Kirkendall LR, Ødegaard F. 2007. Ongoing invasions of old-growth tropical forests: establishment of three incestuous beetle species in Central America (Curculionidae, Scolytinae). Zootaxa, 1588: 53-62.

Li Y, Zhou X, Lai S, Yin T, Ji Y, Wang S, Wang J, Hulcr J. 2018. First Record of *Euplatypus parallelus* (Coleoptera: Curculionidae) in China. Florida Entomologist, 101(1):141-143.

Maruthadurai R, Desai AR, Singh NP. 2013. First record of ambrosia beetle (*Euplatypus parallelus*) infestation on cashew from Goa, India. Phytoparasitica (2014) 42:57–59.

Mecke R, Galileo MHM. 2004. A review of the weevil fauna (Coleoptera, Curculionoidea) of *Araucaria angustifolia* (Bert.) O. Kuntze (Araucariaceae) in South Brazil. Revista Brasileira de Zoologia 21 (3): 505–513.

Medina AL, Florian OP. 2011. Insectos Fitófagos En Plantaciones Comerciales De Acacia Mangium Willd. En La Costa Atlántica Y La Orinoquia Colombiana. Colombia Forestal, 14(2), 175-188.

Peck SB, Thomas MC, Turnbow Jr RH. 2014. The diversity and distributions of the beetles (Insecta: Coleoptera) of the Guadeloupe Archipelago (Grande-Terre, Basse-Terre, La Désirade, Marie-Galante, Les Saintes, and PetiteTerre), Lesser Antilles. Insecta Mundi 2-21.

Schedl KE. 1979. Bark and Timber Beetles from Australia. Contribution to the morphology and taxonomy of the Scolytoidea. 326. Ent. Arb. Mus. Frey 28.

Schönherr J, Pedrosa-Mac JH.1981. Scolytoidea in den Aufforstungen Brasiliens. Ein Beitrag zur Kenntnis der Borkenkafer Siidamerikas. Z. ang. Ent. 92, 4841.

Tarno H, Septia ED, Aini LQ. 2016. Microbial Community Associated With Ambrosia Beetle, *Euplatypus parallelus* on Sonokembang, *Pterocarpus indicus* in Malang. Agrivita Journal of Agricultural Science, 38(3): 312-320.

Tarno H, Suprapto H, Himawan T. 2014. First Record of Ambrosia Beetle (*Euplatypus Paralellus* Fabricius) Infestation on Sonokembang (*Pterocarpus Indicus* Willd.) from Malang Indonesia. Agrivita Vol. 36 no.2 June.

UK Risk Register. Record for *Euplatypus parallelus*. https://secure.fera.defra.gov.uk/phiw/riskRegister/viewPestRisks.cfm?cslref=27625

Whitehead P. 2001. *Euplatypus parallelus* (Fabricius) (Col., Platypodidae) confirmed as British. Entomologist's Gazette 52:262.

Wood SL, Bright DE Jr. 1992. Great Basin Naturalist Memoirs. A Catalog of Scolytidae and Platypodidae (Coleoptera), Part 2: Taxonomic Index.

Yang Y, Wang XG, Li YX, Liu HX, Chai QX, Lian ZM, Wei ZM. 2017. The complete mitochondrial genome of *Euplatypus parallelus* (Coleoptera: Curculionidae), Mitochondrial DNA Part B, 2:1, 214-215, DOI: 10.1080/23802359.2016.1275840

Zanuncio JC, Sossai MF, Couto L, Pinto R. 2002. Occurrence of *Euplatypus parallelus*, *Euplatypus* sp. (col.: Euplatypodidae) and *Xyleborus affinis* (col.: Scolytidae) in *Pinus* sp. in Ribas do Rio Pardo, Mato Grosso do Sul, Brazil. Ocorrência de *Euplatypus parallelus*, *Euplatypus* sp. (col.: Euplatypodidae) e *Xyleborus affinis* (col.: Scolytidae) em *Pinus* sp. no município de Ribas do Rio Pardo, Mato Grosso do Sul. Revista Árvore, 26(3), 387-389. https://dx.doi.org/10.1590/S0100-67622002000300015

Zanuncio JC, Sossai MF, Flechtmann CAH, Zanuncio TV, Guimarães EM, Espindula MC. 2005. Plants of an *Eucalyptus* clone damaged by Scolytidae and Platypodidae (Coleoptera). Pesquisa Agropecuária Brasileira, 40(5), 513-515. https://dx.doi.org/10.1590/S0100-204X2005000500013

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