SCIENTIFIC OPINION

EFSA Journal

ADOPTED: 20 November 2019

doi: 10.2903/j.efsa.2020.5933

List of non-EU Scolytinae of coniferous hosts

EFSA Panel on Plant Health (PLH),
Claude Bragard, Katharina Dehnen-Schmutz, Francesco Di Serio, Paolo Gonthier, Marie-Agnès Jacques, Josep Anton Jaques Miret, Annemarie Fejer Justesen, Alan MacLeod, Christer Sven Magnusson, Juan A. Navas-Cortes, Stephen Parnell, Roel Potting, Philippe Lucien Reignault, Hans-Hermann Thulke, Wopke van der Werf, Antonio Vicent Civera, Jonathan Yuen, Lucia Zappalà, Jean-Claude Grégoire, Franz Streissl, Virág Kertész and Panagiotis Milonas

Abstract

Following a request from the European Commission, the EFSA Panel on Plant Health prepared a list of non-EU Scolytinae spp. (Coleoptera: Curculionidae) affecting coniferous hosts. A literature review and search of databases, conducted up to January 2019, identified 804 Scolytinae species and subspecies of coniferous hosts. These Scolytinae were assigned to two categories (a) 705 non-EU species and subspecies, known to occur only outside the EU or having only limited presence in the EU, and (b) 99 species and subspecies with substantial presence in the EU (i.e. they are only reported so far from the EU or known to occur or be widespread in some Member States or reported in more than three EU MS). Scolytinae of category (b) will be excluded from further categorisation efforts. The main knowledge gaps and uncertainties of this listing concern (i) the status of species that are present in only a few MS and (ii) the status of the species that are present only at boundaries of the EU territory. The non-EU Scolytinae will be categorised by the Panel in a separate opinion.

Keywords: bark beetles, conifers, non-EU, European Union, pest risk, plant health, plant pest, quarantine

Requestor: European Commission

Question number: EFSA-Q-2019-00142

Correspondence: alpha@efsa.europa.eu

Panel members: Claude Bragard, Katharina Dehnen-Schmutz, Francesco Di Serio, Paolo Gonthier, Marie-Agnès Jacques, Josep Anton Jaques Miret, Annemarie Fejer Justesen, Alan MacLeod, Christer Sven Magnusson, Panagiotis Milonas, Juan A Navas-Cortes, Stephen Parnell, Roel Potting, Philippe L Reignault, Hans-Hermann Thulke, Wopke Van der Werf, Antonio Vicent Civera, Jonathan Yuen and Lucia Zappalà.

Acknowledgements: EFSA wishes to acknowledge the contribution of Massimo Faccoli from the Department of Agronomy, Food, Natural Resources, Animals and the Environment at the University of Padua who contributed via a contract (NP/EFSA/ALPHA/2018/02) for a literature review and data collection to this opinion.

Suggested citation: EFSA PLH Panel (EFSA Panel on Plant Health), Bragard C, Dehnen-Schmutz K, Di Serio F, Gonthier P, Jacques M-A, Jaques Miret JA, Justesen AF, MacLeod A, Magnusson CS, Navas-Cortes JA, Parnell S, Potting R, Reignault PL, Thulke H-H, van der Werf W, Civera AV, Yuen J, Zappalà L and Grégoire J-C, Streissl F, Kertész V and Milonas P, 2020. Scientific Opinion on the list of non-EU Scolytinae of coniferous hosts. EFSA Journal 2020;18(1):5933, 56 pp. https://doi.org/10.2903/j.efsa.2020.5933

ISSN: 1831-4732

The EFSA Journal is a publication of the European Food Safety Authority, an agency of the European Union.

Table of contents

1. Introduction

1.1. Background and Terms of Reference as provided by the requestor

1.1.1. Background

Council Directive 2000/29/EC[1] on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community establishes the present European Union plant health regime. The Directive lays down the phytosanitary provisions and the control checks to be carried out at the place of origin on plants and plant products destined for the Union or to be moved within the Union. In the Directive's 2000/29/EC annexes, the list of harmful organisms (pests) whose introduction into or spread within the Union is prohibited, is detailed together with specific requirements for import or internal movement.

Following the evaluation of the plant health regime, the new basic plant health law, Regulation (EU) 2016/2031[2] on protective measures against pests of plants, was adopted on 26 October 2016 and will apply from 14 December 2019 onwards, repealing Directive 2000/29/EC. In line with the principles of the above mentioned legislation and the follow-up work of the secondary legislation for the listing of EU regulated pests, EFSA is requested to provide pest categorizations of the harmful organisms included in the annexes of Directive 2000/29/EC, in the cases where recent pest risk assessment/pest categorisation is not available.

1.1.2. Terms of Reference

EFSA is requested, pursuant to Article 22(5.b) and Article 29(1) of Regulation (EC) No 178/2002,[3] to provide scientific opinion in the field of plant health.

EFSA is requested to prepare and deliver a pest categorisation (step 1 analysis) for each of the regulated pests included in the appendices of the annex to this mandate. The methodology and template of pest categorisation have already been developed in past mandates for the organisms listed in Annex II Part A Section II of Directive 2000/29/EC. The same methodology and outcome is expected for this work as well.

The list of the harmful organisms included in the annex to this mandate comprises 133 harmful organisms or groups. A pest categorisation is expected for these 133 pests or groups and the delivery of the work would be stepwise at regular intervals through the year as detailed below. First priority covers the harmful organisms included in Appendix 1, comprising pests from Annex II Part A Section I and Annex II Part B of Directive 2000/29/EC. The delivery of all pest categorisations for the pests included in Appendix 1 is June 2018. The second priority is the pests included in Appendix 2, comprising the group of *Cicadellidae* (non-EU) known to be vector of Pierce's disease (caused by *Xylella fastidiosa*), the group of *Tephritidae* (non-EU), the group of potato viruses and virus-like organisms, the group of viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L. and the group of *Margarodes* (non-EU species). The delivery of all pest categorisations for the pests included in Appendix 2 is end 2019. The pests included in Appendix 3 cover pests of Annex I part A section I and all pests categorisations should be delivered by end 2020.

For the above mentioned groups, each covering a large number of pests, the pest categorisation will be performed for the group and not the individual harmful organisms listed under "such as" notation in the Annexes of the Directive 2000/29/EC. The criteria to be taken particularly under consideration for these cases, is the analysis of host pest combination, investigation of pathways, the damages occurring and the relevant impact.

Finally, as indicated in the text above, all references to 'non-European' should be avoided and replaced by 'non-EU' and refer to all territories with exception of the Union territories as defined in Article 1 point 3 of Regulation (EU) 2016/2031.

[1] Council Directive 2000/29/EC of 8 May 2000 on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community. OJ L 169/1, 10.7.2000, p. 1–112.

[2] Regulation (EU) 2016/2031 of the European Parliament of the Council of 26 October 2016 on protective measures against pests of plants. OJ L 317, 23.11.2016, p. 4–104.

[3] Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety. OJ L 31/1, 1.2.2002, p. 1–24.

1.1.2.1. Terms of Reference: Appendix 1

List of harmful organisms for which pest categorisation is requested. The list below follows the annexes of Directive 2000/29/EC.

Annex IIAI

(a) Insects, mites and nematodes, at all stages of their development

Aleurocantus spp.
Anthonomus bisignifer (Schenkling)
Anthonomus signatus (Say)
Aschistonyx eppoi Inouye
Carposina niponensis Walsingham
Enarmonia packardi (Zeller)
Enarmonia prunivora Walsh
Grapholita inopinata Heinrich
Hishomonus phycitis
Leucaspis japonica Ckll.
Listronotus bonariensis (Kuschel)
Numonia pyrivorella (Matsumura)
Oligonychus perditus Pritchard and Baker
Pissodes spp. (non-EU)
Scirtothrips aurantii Faure
Scirtothrips citri (Moultex)
Scolytidae spp. (non-EU)
Scrobipalpopsis solanivora Povolny
Tachypterellus quadrigibbus Say
Toxoptera citricida Kirk.
Unaspis citri Comstock

(b) Bacteria

Citrus variegated chlorosis
Erwinia stewartii (Smith) Dye
Xanthomonas campestris pv. *oryzae* (Ishiyama) Dye and pv. *oryzicola* (Fang. et al.) Dye

(c) Fungi

Alternaria alternata (Fr.) Keissler (non-EU pathogenic isolates)
Anisogramma anomala (Peck) E. Müller
Apiosporina morbosa (Schwein.) v. Arx
Ceratocystis virescens (Davidson) Moreau
Cercoseptoria pini-densiflorae (Hori and Nambu) Deighton
Cercospora angolensis Carv. and Mendes
Elsinoe spp. Bitanc. and Jenk. Mendes
Fusarium oxysporum f. sp. *albedinis* (Kilian and Maire) Gordon
Guignardia piricola (Nosa) Yamamoto
Puccinia pittieriana Hennings
Stegophora ulmea (Schweinitz: Fries) Sydow & Sydow
Venturia nashicola Tanaka and Yamamoto

(d) Virus and virus-like organisms

Beet curly top virus (non-EU isolates)
Black raspberry latent virus
Blight and blight-like
Cadang-Cadang viroid
Citrus tristeza virus (non-EU isolates)
Leprosis
Little cherry pathogen (non- EU isolates)
Naturally spreading psorosis
Palm lethal yellowing mycoplasm
Satsuma dwarf virus
Tatter leaf virus
Witches' broom (MLO)

Annex IIB

(a) Insect mites and nematodes, at all stages of their development

Anthonomus grandis (Boh.)
Cephalcia lariciphila (Klug)
Dendroctonus micans Kugelan
Gilphinia hercyniae (Hartig)
Gonipterus scutellatus Gyll.
Ips amitinus Eichhof
Ips cembrae Heer
Ips duplicatus Sahlberg
Ips sexdentatus Börner
Ips typographus Heer
Sternochetus mangiferae Fabricius

(b) Bacteria

Curtobacterium flaccumfaciens pv. flaccumfaciens (Hedges) Collins and Jones

(c) Fungi

Glomerella gossypii Edgerton
Gremmeniella abietina (Lag.) Morelet
Hypoxylon mammatum (Wahl.) J. Miller

1.1.2.2. Terms of Reference: Appendix 2

List of harmful organisms for which pest categorisation is requested per group. The list below follows the categorisation included in the annexes of Directive 2000/29/EC.

Annex IAI

(a) Insects, mites and nematodes, at all stages of their development

Group of Cicadellidae (non-EU) known to be vector of Pierce's disease (caused by *Xylella fastidiosa*), such as:

1) *Carneocephala fulgida* Nottingham
2) *Draeculacephala minerva* Ball
3) *Graphocephala atropunctata* (Signoret)

Group of Tephritidae (non-EU) such as:

1) *Anastrepha fraterculus* (Wiedemann)
2) *Anastrepha ludens* (Loew)
3) *Anastrepha obliqua* Macquart
4) *Anastrepha suspensa* (Loew)
5) *Dacus ciliatus* Loew
6) *Dacus curcurbitae* Coquillet
7) *Dacus dorsalis* Hendel
8) *Dacus tryoni* (Froggatt)
9) *Dacus tsuneonis* Miyake
10) *Dacus zonatus* Saund.
11) *Epochra canadensis* (Loew)
12) *Pardalaspis cyanescens* Bezzi
13) *Pardalaspis quinaria* Bezzi
14) *Pterandrus rosa* (Karsch)
15) *Rhacochlaena japonica* Ito
16) *Rhagoletis completa* Cresson
17) *Rhagoletis fausta* (Osten-Sacken)
18) *Rhagoletis indifferens* Curran
19) *Rhagoletis mendax* Curran
20) *Rhagoletis pomonella* Walsh
21) *Rhagoletis suavis* (Loew)

(c) Viruses and virus-like organisms

Group of potato viruses and virus-like organisms such as:

1) Andean potato latent virus
2) Andean potato mottle virus
3) Arracacha virus B, oca strain
4) Potato black ringspot virus
5) Potato virus T
6) non-EU isolates of potato viruses A, M, S, V, X and Y (including Yo, Yn and Yc) and Potato leafroll virus

Group of viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L., such as:

1) Blueberry leaf mottle virus
2) Cherry rasp leaf virus (American)
3) Peach mosaic virus (American)
4) Peach phony rickettsia
5) Peach rosette mosaic virus
6) Peach rosette mycoplasm
7) Peach X-disease mycoplasm
8) Peach yellows mycoplasm
9) Plum line pattern virus (American)
10) Raspberry leaf curl virus (American)
11) Strawberry witches' broom mycoplasma
12) Non-EU viruses and virus-like organisms of *Cydonia Mill., Fragaria L., Malus Mill., Prunus L., Pyrus L., Ribes L., Rubus L.* and *Vitis L.*

Annex IIAI

(a) Insects, mites and nematodes, at all stages of their development

Group of *Margarodes* (non-EU species) such as:

1) *Margarodes vitis* (Phillipi)
2) *Margarodes vredendalensis* de Klerk
3) *Margarodes prieskaensis* Jakubski

1.1.2.3. Terms of Reference: Appendix 3

List of harmful organisms for which pest categorisation is requested. The list below follows the annexes of Directive 2000/29/EC.

Annex IAI

(a) Insects, mites and nematodes, at all stages of their development

Acleris spp. (non-EU)
Amauromyza maculosa (Malloch)
Anomala orientalis Waterhouse
Arrhenodes minutus Drury
Choristoneura spp. (non-EU)
Conotrachelus nenuphar (Herbst)
Dendrolimus sibiricus Tschetverikov
Diabrotica barberi Smith and Lawrence
Diabrotica undecimpunctata howardi Barber
Diabrotica undecimpunctata undecimpunctata Mannerheim
Diabrotica virgifera zeae Krysan & Smith
Diaphorina citri Kuway
Heliothis zea (Boddie)
Hirschmanniella spp., other than *Hirschmanniella gracilis* (de Man) Luc and Goodey
Liriomyza sativae Blanchard
Longidorus diadecturus Eveleigh and Allen
Monochamus spp. (non-EU)
Myndus crudus Van Duzee
Nacobbus aberrans (Thorne) Thorne and Allen
Naupactus leucoloma Boheman
Premnotrypes spp. (non-EU)
Pseudopityophthorus minutissimus (Zimmermann)
Pseudopityophthorus pruinosus (Eichhoff)
Scaphoideus luteolus (Van Duzee)
Spodoptera eridania (Cramer)
Spodoptera frugiperda (Smith)
Spodoptera litura (Fabricus)
Thrips palmi Karny
Xiphinema americanum Cobb *sensu* lato (non-EU populations)
Xiphinema californicum Lamberti and Bleve-Zacheo

(b) Fungi

Ceratocystis fagacearum (Bretz) Hunt
Chrysomyxa arctostaphyli Dietel
Cronartium spp. (non-EU)
Endocronartium spp. (non-EU)
Guignardia laricina (Saw.) Yamamoto and Ito
Gymnosporangium spp. (non-EU)
Inonotus weirii (Murril) Kotlaba and Pouzar
Melampsora farlowii (Arthur) Davis
Mycosphaerella larici-leptolepis Ito et al.
Mycosphaerella populorum G. E. Thompson
Phoma andina Turkensteen
Phyllosticta solitaria Ell. and Ev.
Septoria lycopersici Speg. var. *malagutii* Ciccarone and Boerema
Thecaphora solani Barrus
Trechispora brinkmannii (Bresad.) Rogers

(c) Viruses and virus-like organisms

Tobacco ringspot virus
Tomato ringspot virus
Bean golden mosaic virus
Cowpea mild mottle virus
Lettuce infectious yellows virus
Pepper mild tigré virus
Squash leaf curl virus
Euphorbia mosaic virus
Florida tomato virus

(d) Parasitic plants

Arceuthobium spp. (non-EU)

Annex IAII

(a) Insects, mites and nematodes, at all stages of their development

Meloidogyne fallax Karssen

Popillia japonica Newman

Rhizoecus hibisci Kawai and Takagi

(b) Bacteria

Clavibacter michiganensis (Smith) Davis et al. ssp. *sepedonicus* (Spieckermann and Kotthoff) Davis et al.

Ralstonia solanacearum (Smith) Yabuuchi et al.

(c) Fungi

Melampsora medusae Thümen

Synchytrium endobioticum (Schilbersky) Percival

Annex I B

(a) Insects, mites and nematodes, at all stages of their development

Leptinotarsa decemlineata Say

Liriomyza bryoniae (Kaltenbach)

(b) Viruses and virus-like organisms

Beet necrotic yellow vein virus

1.2. Interpretation of the Terms of Reference

This scientific opinion presents the list of non-EU Scolytinae spp. on coniferous host plants. They are listed as Scolytidae[4] (non-EU) in the Appendices to the Terms of Reference (ToR) to be subject to pest categorisation to determine whether they fulfil the criteria of quarantine pests or those of regulated non-quarantine pests for the area of the EU excluding Ceuta, Melilla and the outermost regions of Member States (MS) referred to in Article 355(1) of the Treaty on the Functioning of the European Union (TFEU), other than Madeira and the Azores.

As a first step toward this goal, the Panel prepared a list of Scolytinae species on coniferous host plants. The list is based on information collected from various literature sources and databases up to January 2019.

In the process, two groups of Scolytinae were distinguished:

(a) non-EU Scolytinae of coniferous hosts and
(b) Scolytinae with significant presence in the EU (known to occur in several MS, frequently reported in the EU, widespread in some MS) or so far reported only from the EU.

A non-EU Scolytinae is defined by its geographical distribution outside of the EU territory. As such, Scolytinae not reported from the EU and occurring only outside of the EU territory are considered as non-EU Scolytinae. Furthermore, Scolytinae occurring outside the EU and having only a limited presence in the EU (reported from only a few MS, with restricted distribution) are also considered as non-EU. The status of each species occupying 1, 2 or 3 MSs was then further examined. The panel identified three different groups: (i) species endemic only in the EU, (ii) species known for a long time to be established in MSs at the border of the EU, obviously at the margin of their distribution area outside of the EU, and (iii) species apparently distributed at random within the EU, suggesting recent and distinct introductions. The first two groups were excluded from further categorisation while the species in the last group were included as 'non-EU species'.

This opinion provides the methodology and results for this classification which prepares but does not preclude the actual pest categorisation linked to the present mandate. This means that the Panel will then perform a pest categorisation for the non-EU Scolytinae of coniferous hosts.

[4] Although the leading taxonomists in the 2000s (Wood, 1982; Bright and Skidmore, 2002) still considered the Scolytidae to be a family distinct from the Curculionidae according to morphological criteria, modern phylogenetics supports the position of scolytine beetles (Scolytinae) within the family Curculionidae (Knížek and Beaver, 2004; Hulcr et al., 2015). This is reflected by the growing number of citations in Scopus referring to Scolytinae (18 in 1990 vs. 210 in 2018), as opposed to citations referring to Scolytidae (50 in 1990 vs. 16 in 2018). The Scolytinae includes two subcategories, the 'bark beetles' which live in the phloem, and the 'ambrosia beetles' which live in the sapwood.

2. Data and methodologies

The preparatory work (literature review and data collection) for the current opinion was outsourced to the University of Padova (Department of Agronomy, Food, Natural Resources, Animals and Environment). The raw data can be downloaded under supporting documents (Annex A, Full list non-EU Scolytinae and Annex B, Short list non-EU Scolytinae). A comprehensive worldwide list of Scolytinae species living on conifers was generated by screening the databases of the European and Mediterranean Plant Protection Organisation (EPPO) and the Centre for Agriculture and Biosciences International (CABI), as well as available comprehensive and updated species lists and catalogues specific literature concerning all Scolytinae species in the world (Wood and Bright, 1992; Bright and Skidmore, 1997; Bright and Skidmore, 2002; Bright, 2014), or occurring in geographical areas hosting native conifers, such as North, Central and South America (Wood, 1982, 2007), Europe and North Africa (Pfeffer 1995, Knízek, 2011; Alonso-Zarazaga et al., 2017), Australia (www.padil.gov.au), New Zealand (Brockerhoff et al., 2003) and Asia (Stark, 1952, Knízek, 2011; Alonso-Zarazaga et al., 2017).

Information on host(s) and distribution of Scolytinae in the first instance were retrieved from the EPPO Global Database (EPPO, 2019), the Centre for Agriculture and Biosciences International (CABI) and relevant publications.

From the above-mentioned sources, information was collected about

- species taxonomy (tribe);
- geographic distribution at continental level, considering the following macroregions: North America, Central America, South America, Europe, Asia, Oceania, North Africa, sub-Saharan Africa). For all the species reported in the EU the geographic distribution was provided both at EU-member states and at non-EU European country levels in order to understand their distribution in Europe;
- feeding habits (herbiphagy, spermatophagy, mycophagy, myelophagy, phloeophagy, xylomycetophagy, xylophagy);
- list of host trees (at genus level) considering the most common conifer genera that are hosts of bark beetles: *Abies* spp., *Cupressus* spp., *Larix* spp., *Picea* spp., *Pinus* spp., *Taxus* spp., *Juniperus* spp., *Cedrus* spp., *Chamaecyparis* spp., *Pseudotsuga* spp., *Tsuga* spp., *Thuja* spp.; other possible hosts will be included in the category 'other conifers';
- potential for introduction: dispersal by trade reflected by the total number of interceptions of a given non-EU Scolytinae species or genus recorded in the past years in the international ports and airports of North America, Europe, Australia and New Zealand. This information was obtained in the databases of USDA APHIS – Agriculture Quarantine Inspection, Australian Quarantine and Inspection Service, New Zealand Ministry of Primary Industries, Canadian Food Inspection Agency and Canadian Border Service Agency, EUROPHYT, and in specific literature and reviews such as, for instance, Brockerhoff et al. (2006) or Haack and Rabaglia (2013). Natural dispersal capacities by flight are rarely described and therefore were not investigated when building this list.

Further references and information were obtained from experts and from citations within primary references. Data collected from National Plant Protection Organisations of the MS were also considered.

The collected information was used to fill an extraction table (Annex A) that presents all raw data obtained.

Only the non-EU Scolytinae on conifers will be subject of further categorisation efforts in the frame of the present mandate. The Scolytinae excluded from this group are therefore referred to in the present opinion as Scolytinae excluded from further categorisation in the frame of the present mandate.

3. Listing of non-EU Scolytinae

All Scolytinae species and subspecies identified in the literature and database searches have been listed and subsequently organised into the two groups specified below.

3.1. Scolytinae considered as non-EU

The Scolytinae considered as non-EU (Appendix A) belong to two subcategories:

- Scolytinae not known to be present in the EU,
- Scolytinae known to be present outside the EU and with only limited presence (i.e. reported in up to three MS, known to have restricted distribution) in the EU.

3.2. Scolytinae excluded from further categorisation in the frame of the present mandate

The Scolytinae species excluded from further categorisation in the frame of the present mandate are listed in Appendix B. They belong to two subcategories:

- Scolytinae species reported only from the EU,
- Scolytinae species known to be present outside the EU, but with a substantial presence also in the EU (known to occur in several MS, frequently reported in the EU, widespread in some MSs)

4. Uncertainties

- When a species is present in only a few MS, its status (widely or locally established; transient) is often unclear from the literature.
- It is sometimes unclear whether species that are only present at the boundaries of the EU as well as in contiguous non-EU countries are in the process of moving into the EU or have been established in these EU MS for a long time.
- Limited efforts on surveillance and therefore incomplete distribution data are an additional uncertainty that might be included. Non-English (local) literature reports may have been overlooked.

5. Conclusions

The Panel was requested by the European Commission to produce a pest categorisation of 133 harmful organisms or groups listed in annexes of Directive 2000/29/EC. One of the groups for which the categorisation will be prepared is non-EU Scolytinae spp. As a first step, a systematic approach identified 804 species and subspecies of Scolytinae species feeding on conifers.

Among these Scolytinae species and subspecies, based on information on distribution and prevalence both inside and outside the EU, the Panel identified 705 non-EU species and subspecies, known to occur only outside the EU or having only a limited presence in the EU (Appendix A). These Scolytinae will be further categorised in a separate opinion.

The remaining 99 Scolytinae species and subspecies which have a substantial presence in the EU or are so far reported from the EU only (Appendix B), will not be categorised within the current mandate. However, the Commission may, at any time, request EFSA to categorise some or all the Scolytinae excluded from the present exercise.

The main knowledge gaps and uncertainties of this listing concern (i) the status of species that are present in only a few MS, and (ii) and the status of the species present only at the boundaries of the EU.

References

Alonso-Zarazaga MA, Barrios H, Borovec R, Bouchard P, Caldara R, Colonnelli E, Gültekin L, Hlavác P, Korotyaev B, Lyal CHC, Machado A, Meregalli M, Pierotti H, Ren L, Sánchez-Ruiz M, Sforzi A, Silfverberg H, Skuhrovec J, Trýzna M, Velázquez de Castro AJ and Yunakov NN, 2017. Cooperative Catalogue of Palaearctic Coleoptera Curculionoidea. Monografías electrónicas S.E.A., vol. 8, Sociedad Entomológica Aragonesa S.E.A., Zaragoza, Spain, 729 pp. Available online: https://www.researchgate.net/publication/320895385_Cooperative_Catalogue_of_Palaearctic_Coleoptera_Curculionoidea [Accessed: 15 Jan 2019]

Anses, 2017. Avis et rapport de l'Anses relatif à "une demande d'une évaluation du risque simplifiée (ERS) sur Xylosandrus compactus (Eichhoff) identifié en France métropolitaine". Anses, Maisons-Alfort. 68 pp. Available online: https://www.anses.fr/fr/system/files/SANTVEG2016SA0170Ra.pdf

ArtDatabanken (Swedish Species Information Centre), 2015. Rödlistade arter i Sverige 2015. Swedish Red List produced by the Swedish Species Information Center. ArtDatabanken SLU, Uppsala. Available online: https://www.artdatabanken.se/globalassets/ew/subw/artd/2.-var-verksamhet/publikationer/22.-rodlistan-2015/rodlistan_2015.pdf

ArtDatabanken SLU (Swedish Species Information Centre), 2019a. Artfakta. Available online: https://artfakta.se/artbestamning/taxon/carphoborus-rossicus-100548 [Accessed: 20 June 2019]

ArtDatabanken SLU (Swedish Species Information Centre), 2019b. Artfakta. Available online: https://artfakta.se/artbestamning/taxon/carphoborus-teplouchovi-102206 [Accessed: 20 June 2019]

ArtDatabanken SLU (Swedish Species Information Centre), 2019c. Artfakta. Available online: https://artfakta.se/artbestamning/taxon/pityogenes rkutensis-102325 [Accessed: 20 June 2019]

ArtDatabanken SLU (Swedish Species Information Centre), 2019d. Artfakta. Available online: https://artfakta.se/artbestamning/taxon/pityogenes-saalasi-102326 [Accessed: 20 June 2019]

ArtDatabanken SLU (Swedish Species Information Centre), 2019e. Artfakta. Available online: https://artfakta.se/artbestamning/taxon/ips-cembrae-106569 [Accessed: 20 June 2019]
ArtDatabanken SLU (Swedish Species Information Centre), 2019f. Artfakta. Available online: https://artfakta.se/artbestamning/taxon/phloeosinus-thujae-264275 [Accessed: 20 June 2019]
ArtDatabanken SLU (Swedish Species Information Centre), 2019g. Artportalen (Swedish species observation system). Available online: http://www.artportalen.se/ [Accessed: 20 June 2019]
Artsdatabanken, 2019. Artsobservasjoner. Available online: https://www.artsobservasjoner.no/ [Accessed 20 June 2019]
Atkinson T, 2018.Bark and Ambrosia Beetles web-page on Check-lists of scolytids from Americas. Available online: https://www.barkbeetles.info/index.php
Björklund N and Boberg J, 2017. Rapid Pest Risk Analysis Xylosandrus germanus. Unit for Risk Assessment of Plant Pests, Swedish University of Agricultural Sciences. Available online: https://www.slu.se/globalassets/ew/org/centrb/riskv/pub/xylosandrus-germanus-rapid-pest-risk-analysis.pdf
Bright DE, 2014. A Catalog of Scolytidae and Platypodidae (Coleoptera), Supplement 3 (2000-2010), with notes on subfamily and tribal reclassifications. Insecta Mundi, 861, 339 pp.
Bright DE and Skidmore RE, 1997. A catalog of Scolytidae and Platypodidae (Coleoptera), Supplement 1 (1990-1994). NRC Research Press, 368 pp.
Bright DE and Skidmore RE, 2002. A Catalog of Scolytidae and Platypodidae (Coleoptera), Supplement 2 (1995–1999). NRC Research Press, 1–523.
Brockerhoff EG, Knízek M and Bain J, 2003. Checklist of indigenous and adventive bark and ambrosia beetles (Curculionidae: Scolytinae and Platypodinae) of New Zealand and interceptions of exotic species (1952-2000). New Zealand Entomologist, 26, 29–44.
Brockerhoff GE, Bain J, Kimberley M and Knízek M, 2006. Interception frequency of exotic bark and ambrosia beetles (Coleoptera: Scolytinae) and relationship with establishment in New Zealand and worldwide. Canadian Journal of Forest Research, 36, 289–298.
EPPO (European and Mediterranean Plant Protection Organization), 2019. EPPO Global Database. Available online: https://gd.eppo.int [Accessed: 09 Jan 2019]
Ericson B, 2010. Två för Sverige nya skalbaggar (Coleoptera) som angriper lärk. Ent. Tidskr, 131, 131–136.
Garonna AP, Dole SA, Saracino A, Mazzoleni S and Cristinzio G, 2012.First record of the black twig borer *Xylosandrus compactus* (Eichhoff) (Coleoptera: Curculionidae, Scolytinae) from Europe. Zootaxa, 3251, 64–68.
Geister I, 2004. Popis rastlin in živali na Brdu pri Kranju. Kronika (Ljubljana), 52, 273–284.
Gomez D, Martinez G and Beaver R, 2012. First record of *Cyrtogenius lutus* (Blandford) (Coleoptera: Curculionidae: Scolytinae) in the Americas and its distribution in Uruguay. The Coleopterists Bulletin, 66, 362–364.
Haack RA and Rabaglia RJ, 2013. Exotic Bark and Ambrosia Beetles in the USA: Potential and Current Invaders. In: Pena Jorge E (ed). Potential Invasive Pests of Agricultural Crops. CABI International, Wallingford, UK. pp. 48–74 Chapter 3.
Hansen M, 1996. Katalog over Danmarks biller – Catalogue of the Coleoptera of Denmark. Enomologiske meddelser – Entomologisk forening Kobenhavn, 64.
Heijerman T, 2010. Lijst van niet nheemse soorten. Gepubliceerd in: Vorst, O. Catalogus van de Nederlandse kevers (Coleoptera) 202–207.
Heijerman T and Noordijk J, 2016. Monochamus-monitoring 2015: inventarisatie van zwarte den-opstanden in Noord-Holland. Annual report of the EIS Kenniscentrum Insecten.
Heijerman T and Noordijk J, 2017. Monochamus-monitoring 2016: populatieonderzoek in de Schoorlse Duinen en bij Nuenen. Annual report of the EIS Kenniscentrum Insecten.
Heijerman T and Noordijk J, 2018. Monochamus-monitoring 2017 populatieonderzoek in de Schoorlse Duinen en evaluatie van nieuwe lokstoffen en een nieuw valtype. Annual report of the EIS Kenniscentrum Insecten.
Heijerman T and Noordijk J, 2019. Op zoek naar efficiënte vangmethoden voor het monitoren van houtgerelateerde kevers. Annual report of the EIS Kenniscentrum Insecten.
Hulcr J, Atkinson T, Cognato AI, Jordal BH and McKenna DD, 2015. Morphology, taxonomy and phylogenetics of bark beetles. In: Vega FE and Hofstetter RW (eds). Bark Beetles. Biology and Ecology of Native and Invasive Species. Elsevier, Netherlands. pp. 41–84.
Hyvärinen E, Juslén A, Kemppainen E, Uddström A and Liukko UM. (eds.), 2019. The 2019 Red List of Finnish Species. Ympäristöministeriö & Suomen ympäristökeskus. Helsinki. 704 p. Available online: https://helda.helsinki.fi/handle/10138/299501
de Jong Y, Verbeek M, Michelsen V, Bjørn P, Los W, Steeman F, Bailly N, Basire C, Chylarecki P, Stloukal E, Hagedorn G, Wetzel F, Glöckler F, Kroupa A, Korb G, Hoffmann A, Häuser C, Kohlbecker A, Müller A, Güntsch A, Stoev P and Penev L, 2014. Fauna Europaea - all European animal species on the web. Biodiversity Data Journal, 2, e4034. https://doi.org/10.3897/BDJ.2.e4034. Available online: https://fauna-eu.org/ [Accessed: 20 June 2019]
Jurc M and Bojović S, 2004. Bark beetle outbreaks during the last decade with special regard to the eight-toothed bark beetle (*Ips amitinus* Eichh.) outbreak in the Alpine region of Slovenia. V: CSÓKA, György (ur.). Biotic damage in forests: proceedings of the IUFRO Symposium (WP 7. 03. 10 "Methodolgy of forest pest and disease survey in Central Europe") held in Mátrafüred, Hungary, September 12-16. Mátrafüred: Hungarian forest research institute. 2004, str. 85-95.

Jurc M, Zavrtanik Z and Reščič M, 2010. Tujerodni podlubnik Xylosandrus germanus se širi v gozdovih Slovenije. Novice iz Varstva Gozdov, 3, 10–13.
Karpinski JJ, 1931. Korniki (Ipidae) Puszczy Bialowieskiej (Borkenkäfer des Bialowieza-Urwaldes). Polskie Pismo Entomologiczne, 1, 18–39.
Kirkendall LR and Faccoli M, 2010. Bark beetles and pinhole borers (Curculionidae, Scolytinae, Platypodinae) alien to Europe. ZooKeys, 56, 227.
Knízek M, 2011. Scolytinae and Platypodinae. p. 86-87, 201-251. In: Löbl I and Smetana A (eds.). Catalog of Palaearctic Coleoptera. Vol 7. Apollo Books, Stenstrup. p. 373.
Knížek M and Beaver R, 2004. Taxonomy and systematics of bark and ambrosia beetles. In: Lieutier F, Day K, Battisti A, Grégoire JC and Evans H (eds.). Bark and Wood Boring Insects in Living Trees in Europe, a Synthesis. Kluwer, Dordrecht. pp. 41-54. https://doi.org/10.1007/978-1-4020-2241-8_11
Kolařík M, Kostovčík M and Pažoutová S, 2007. Host range and diversity of the genus Geosmithia (Ascomycota: Hypocreales) living in association with bark beetles in the Mediterranean area. Mycological Research, 111, 1298–1310.
Lekander B, Bejer-Petersen B, Kangas E and Bakke A, 1977. The distribution of Bark Beetles in the Nordic Countries. Acta Entomologica Fennica, 32.
Lindelöw Å, 2013. Väntad barkborre funnen i Sverige - fynd av Ips amitinus (Coleoptera; Scolytinae). Ent. Tidskrift., 134, 203–206.
Maiti PK and Saha N, 2004. Fauna of India and the adjacent countries. Scolytidae: Coleoptera (bark and ambrosia beetles): Volume I (part 1), introduction and tribe Xleborini. Zoological Survey of India, Kolkata, pp.xii + 268 pp.
Martikainen P, Siitonen J, Kaila L, Punttila P and Rauh J, 1999. Bark beetles (Coleoptera, Scolytidae) and associated beetle species in mature managed and old-growth boreal forests in southern Finland. Forest Ecology and Management, 116, 233–245.
Mercado-Velez JE, Negron JF, 2014. Revision of the new world species of *Hylurgops* LeConte, 1876 with the description of a new genus in the Hylastini (Coleoptera: Scolytinae) and comments on some Palearctic species. Zootaxa, 3785, 301–342.
Moraal L, 2005. Insectenplagen op bomen en struiken in bos en landelijk gebied in 2004. Vakblad Natuur Bos en Landschap, 2, 18–21.
Moucheron B, Dahan L, Raemdonck H and Drumont A, 2018. Pityokteines vorontzowi (Jakobson, 1896), Scolyte nouveau pour la faune de Belgique (Coleoptera, Curculionidae, Scolytinae). Lambillionea. CXVIII., 195–200.
Moucheron B, Dahan L, Delbol M, Ignace D, Limbourg P, Raemdonck H and Drumont A, 2019. Phloeosinus rudis Blandford, 1894, scolyte invasif et nouveau pour la faune belge (Coleoptera, Curculionidae, Scolytinae). Lambillionea CXIX, 1, 25–33.
Pennachio F, Danti R, Benassai D, Squarcini M, Marziali L, Di Lonardo V and Roversi PF, 2013. A new additional record of *Phloeosinus armatus* Reitter from Italy (Coleoptera, Curculionidae, Scolytinae) REDIA. XCVI, 2013, 45–50.
Pfeffer A, 1995. Zentral- und Westpaläarktische Borken- und Kernkäfer. (Coleoptera: Scolytidae, Platypodidae). Pro Entomolgia, Naturhistorisches Museum Basel, Basel, 310 pp.
Spanou K, Marathianou M, Gouma M, Dimou D, Nikoletos L, Milonas PG and Papachristos DP, 2019. First record of black twig borer *Xylosandrus compactus* (Coleoptera: Curculionidae) in Greece. 18th Panhellenic Entomological Congress, KOMOTINI 15-17/10/2019, abstract page 77
Stark VN, 1952. Bark Beetles. Fauna of the U.S.S.R. Coleoptera. Vol. 31. Izdatel`stvo Akademii Nauk, Moscow, Leningrad. 462 pp.
Titovšek J, 1983. Contribution to the knowledge of bark-beetles (Scolytidae) in Slovenia (in SLO). Zbornik Gozdarstva in Lesarstva, 23, 378–438.
Titovšek J, 1988. Podlubniki (Scolytidae) Slovenije. Obvladovanje podlubnikov. Ljubljana, 128 str.
Voolma K, Mandelshtam MJ, Shcherbakov AN, Yakovlev EB, Õunap H, Süda I and Lipatkin VA, 2004. Distribution and spread of bark beetles (Coleoptera: Scolytidae) around the Gulf of Finland: a comparative study with notes on rare species of Estonia, Finland and North-Western Russia. Entomologica Fennica, 15, 198–210.
Vorst, 2010. Curculionidae: Scolytinae, Platypodinae. Gepubliceerd in Catalogus van de Nederlandse kevers (Coleoptera) 179–182.
Vorst O, Heijerman T, van Nunen F and van Wielink P, 2008. Enige schorskevers nieuw voor de nederlandse fauna (Coleoptera: Curculionidae: Scolytinae). Nederlandse faunistische mededelingen 29.
Wood SL, 1982. The Bark and Ambrosia Beetles of North and Central America (Coleoptera: Scolytidae), a Taxonomic Monograph. Brigham Young University, Provo, Utah. p. 1359.
Wood SL, 2007. Bark and ambrosia beetles of South America (Coleoptera: Scolytidae). Brigham Young University, M. L. Bean Life Sciences Museum, 900 pp.
Wood SL and Bright DE, 1992. A catalog of Scolytidae and Platypodidae (Coleoptera), Part 2. Taxonomic Index (Volumes A, B). Great Basin Nat. Mem., 13, 1–1553.

Abbreviations

CABI Centre for Agriculture and Bioscience International
EPPO European and Mediterranean Plant Protection Organization
FAO Food and Agriculture Organization
IPPC International Plant Protection Convention
MS Member State
NCBI National Center for Biotechnology Information
PLH EFSA Panel on Plant Health
TFEU Treaty on the Functioning of the European Union
ToR Terms of Reference

Appendix A – scolytinae species considered as non-EU

The appendix lists the Scolytinae species considered as non-EU, their geographic occurrence in the EU (at MS level) and outside the EU (at continent level, or at country level for those species that are present also in the EU), the associated uncertainties or comments, as well as the main references from which the information was extracted.

ID	Species	Presence in EU MS	Presence outside EU	Comments/ Uncertainties	Reference
1.	*Acanthotomicus curvidens*		Sub-Saharan Africa		Wood and Bright (1992)
2.	*Ambrosiodmus eichhoffi*		Sub-Saharan Africa		Wood and Bright (1992)
3.	*Ambrosiodmus funebris*		South America		Atkinson (2018)
4.	*Ambrosiodmus hagedorni*		North America, Central America, South America		Atkinson (2018)
5.	*Ambrosiodmus innominatus*		Oceania		Wood and Bright (1992)
6.	*Ambrosiodmus lecontei*		North America, Central America		Atkinson (2018)
7.	*Ambrosiodmus lewisi*		North America, Asia		Atkinson (2018)
8.	*Ambrosiodmus rusticus*		North America, Central America, South America		Atkinson (2018)
9.	*Araptus andinus*		South America		Atkinson (2018)
10.	*Araptus araucariae*		South America		Atkinson (2018)
11.	*Araptus impensus*		South America		Atkinson (2018)
12.	*Araptus sobrinus*		Central America		Atkinson (2018)
13.	*Cactopinus koebelei*		North America		Atkinson (2018)
14.	*Cactopinus pini*		North America		Atkinson (2018)
15.	*Carphobius arizonicus*		North America		Atkinson (2018)
16.	*Carphobius cupressi*		Central America		Atkinson (2018)
17.	*Carphobius pilifer*		North America		Atkinson (2018)
18.	*Carphoborus andersoni*		North America		Atkinson (2018)
19.	*Carphoborus bicornis*		North America		Atkinson (2018)
20.	*Carphoborus bifurcus*		North America, Central America		Atkinson (2018)
21.	*Carphoborus blaisdelli*		North America		Atkinson (2018)
22.	*Carphoborus bonnairei*		Asia, North Africa		Alonso-Zarazaga et al. (2017)
23.	*Carphoborus brevisetosus*		North America		Atkinson (2018)
24.	*Carphoborus carri*		North America		Atkinson (2018)
25.	*Carphoborus convexifrons*		North America		Atkinson (2018)

ID	Species	Presence in EU MS	Presence outside EU	Comments/ Uncertainties	Reference
26.	*Carphoborus costatus*		Asia		Alonso-Zarazaga et al. (2017)
27.	*Carphoborus declivis*		North America		Atkinson (2018)
28.	*Carphoborus dunni*		North America		Atkinson (2018)
29.	*Carphoborus frontalis*		North America		Atkinson (2018)
30.	*Carphoborus henscheli*	Cyprus	Georgia, Turkey, Israel, Syria		Alonso-Zarazaga et al. (2017) and de Jong et al. (2014)
31.	*Carphoborus intermedius*		North America		Atkinson (2018)
32.	*Carphoborus jurinskii*		Asia		Alonso-Zarazaga et al. (2017)
33.	*Carphoborus marani*	Greece, Hungary	European Russia	Presence in Hungary only mentioned once and never confirmed later (Milos Knizek, pers. comm.)	Alonso-Zarazaga et al. (2017) and de Jong et al. (2014)
34.	*Carphoborus mexicanus*		North America		Atkinson (2018)
35.	*Carphoborus perplexus*		North America		Atkinson (2018)
36.	*Carphoborus piceae*		North America		Atkinson (2018)
37.	*Carphoborus pinicolens*		North America		Atkinson (2018)
38.	*Carphoborus ponderosae*		North America		Atkinson (2018)
39.	*Carphoborus pseudotsugae*		North America		Atkinson (2018)
40.	*Carphoborus radiatae*		North America		Atkinson (2018)
41.	*Carphoborus sansoni*		North America		Atkinson (2018)
42.	*Carphoborus simplex*		North America		Atkinson (2018)
43.	*Carphoborus taireiensis*		Asia		Alonso-Zarazaga et al. (2017)
44.	*Carphoborus vandykei*		North America		Atkinson (2018)
45.	*Carphoborus zhobi*		Asia		Alonso-Zarazaga et al. (2017)
46.	*Chramesus spinosus*		South America		Atkinson (2018)
47.	*Cnestus mutilatus*		North America, Asia, Oceania		Alonso-Zarazaga et al. (2017) and Atkinson (2018)
48.	*Coccotrypes advena*		North America, Central America, Asia, Oceania		Wood and Bright (1992)
49.	*Coccotrypes cinnamomi*		Asia		Wood and Bright (1992)
50.	*Coccotrypes fijianus*		Oceania		Wood and Bright (1992)
51.	*Coccotrypes leveri*		Oceania		Wood and Bright (1992)

ID	Species	Presence in EU MS	Presence outside EU	Comments/ Uncertainties	Reference
52.	*Coccotrypes medius*		Asia		Wood and Bright (1992)
53.	*Coccotrypes norimasanus*		Asia		Alonso-Zarazaga et al. (2017)
54.	*Coccotrypes nubilus*		Asia, Sub-Saharan Africa		Alonso-Zarazaga et al. (2017)
55.	*Coccotrypes recticollis*		Asia		Wood and Bright (1992)
56.	*Conophthorus apachecae*		North America		Atkinson (2018)
57.	*Conophthorus conicolens*		North America		Atkinson (2018)
58.	*Conophthorus coniperda*		North America		Atkinson (2018)
59.	*Conophthorus echinatae*		North America		Atkinson (2018)
60.	*Conophthorus edulis*		North America		Atkinson (2018)
61.	*Conophthorus mexicanus*		North America, Central America		Atkinson (2018)
62.	*Conophthorus michoacanae*		North America		Atkinson (2018)
63.	*Conophthorus monophyllae*		North America		Atkinson (2018)
64.	*Conophthorus ponderosae*		North America		Atkinson (2018)
65.	*Conophthorus radiatae*		North America		Atkinson (2018)
66.	*Conophthorus resinosae*		North America		Atkinson (2018)
67.	*Conophthorus teocotum*		North America		Atkinson (2018)
68.	*Conophthorus terminalis*		North America		Atkinson (2018)
69.	*Corthylus rufopilosus*		South America		Atkinson (2018)
70.	*Corthylus schaufussi*		South America		Atkinson (2018)
71.	*Corthylus simplex*		Central America		Atkinson (2018)
72.	*Cryphalus araucariae*		Oceania		Wood and Bright (1992)
73.	*Cryphalus brunneus*		Oceania		Wood and Bright (1992)
74.	*Cryphalus chamaeciparіae*		Asia		Alonso-Zarazaga et al. (2017)
75.	*Cryphalus chinlingensis*		Asia		Alonso-Zarazaga et al. (2017)
76.	*Cryphalus cryptomeriae*		Asia		Alonso-Zarazaga et al. (2017)
77.	*Cryphalus cylindrus*		Oceania		Wood and Bright (1992)
78.	*Cryphalus dissimilis*		Asia		Alonso-Zarazaga et al. (2017)
79.	*Cryphalus diversicolor*		Oceania		Wood and Bright (1992)
80.	*Cryphalus fulvus*		Asia		Alonso-Zarazaga et al. (2017)
81.	*Cryphalus jeholensis*		Asia		Alonso-Zarazaga et al. (2017)
82.	*Cryphalus jezoensis*		Asia		Alonso-Zarazaga et al. (2017)

ID	Species	Presence in EU MS	Presence outside EU	Comments/ Uncertainties	Reference
83.	*Cryphalus kurenzovi*		Asia		Alonso-Zarazaga et al. (2017)
84.	*Cryphalus laricis*		Asia		Alonso-Zarazaga et al. (2017)
85.	*Cryphalus latus*		Asia		Alonso-Zarazaga et al. (2017)
86.	*Cryphalus lepocrinus*		Asia		Alonso-Zarazaga et al. (2017)
87.	*Cryphalus lipingensis*		Asia		Alonso-Zarazaga et al. (2017)
88.	*Cryphalus longisetosus*		Asia		Alonso-Zarazaga et al. (2017)
89.	*Cryphalus major*		Asia		Alonso-Zarazaga et al. (2017)
90.	*Cryphalus malloti*		Asia		Wood and Bright (1992)
91.	*Cryphalus markangensis*		Asia		Alonso-Zarazaga et al. (2017)
92.	*Cryphalus massonianus*		Asia		Alonso-Zarazaga et al. (2017)
93.	*Cryphalus miyalopiceus*		Asia		Alonso-Zarazaga et al. (2017)
94.	*Cryphalus montanus*		Asia		Alonso-Zarazaga et al. (2017)
95.	*Cryphalus niponensis*		Asia		Alonso-Zarazaga et al. (2017)
96.	*Cryphalus piceus*		Asia		Alonso-Zarazaga et al. (2017)
97.	*Cryphalus pilosus*		Asia		Alonso-Zarazaga et al. (2017)
98.	*Cryphalus pseudochinlingensis*		Asia		Alonso-Zarazaga et al. (2017)
99.	*Cryphalus pseudotabulaeformis*		Asia		Alonso-Zarazaga et al. (2017)
100.	*Cryphalus pubescens*		North America		Atkinson (2018)
101.	*Cryphalus redikorzevi*		Asia		Alonso-Zarazaga et al. (2017)
102.	*Cryphalus rubentis*		North America		Atkinson (2018)
103.	*Cryphalus ruficollis*		North America		Atkinson (2018)
104.	*Cryphalus sawadai*		Asia		Alonso-Zarazaga et al. (2017)
105.	*Cryphalus sichotensis*		Asia		Alonso-Zarazaga et al. (2017)
106.	*Cryphalus sinoabietis*		Asia		Alonso-Zarazaga et al. (2017)
107.	*Cryphalus strohmeyeri*		Asia		Alonso-Zarazaga et al. (2017)
108.	*Cryphalus sylvicola*		Oceania		Wood and Bright (1992)
109.	*Cryphalus szechuanensis*		Asia		Alonso-Zarazaga et al. (2017)
110.	*Cryphalus tabulaeformis*		Asia		Alonso-Zarazaga et al. (2017)
111.	*Cryphalus taiwanus*		Asia		Alonso-Zarazaga et al. (2017)

ID	Species	Presence in EU MS	Presence outside EU	Comments/ Uncertainties	Reference
112.	*Cryphalus yamaguchii*		Asia		Alonso-Zarazaga et al. (2017)
113.	*Cryptoxyleborus gracilior*		Oceania		Wood and Bright (1992)
114.	*Crypturgus alutaceus*		North America, Central America		Atkinson (2018)
115.	*Crypturgus beesoni*		Asia		Alonso-Zarazaga et al. (2017)
116.	*Crypturgus borealis*		North America		Atkinson (2018)
117.	*Crypturgus cedri*		North Africa		Alonso-Zarazaga et al. (2017)
118.	*Crypturgus concolor*		North Africa		Alonso-Zarazaga et al. (2017)
119.	*Crypturgus dubius*	France, Spain	Turkey, Iran	Presence in France and Spain is doubtful FR NPPO: the alleged presence in France is due to an error in labelling	Alonso-Zarazaga et al. (2017) and de Jong et al. (2014)
120.	*Crypturgus tuberosus*		Asia		Alonso-Zarazaga et al. (2017)
121.	*Cyrtogenius agathis*		Asia		Wood and Bright (1992)
122.	*Cyrtogenius brevior*		Asia		Wood and Bright (1992)
123.	*Cyrtogenius luteus*	Italy	China, Japan, South Korea, South America	Introduced species	Atkinson (2018) and Gomez et al. (2012)
124.	*Cyrtogenius perakensis*		Asia		Alonso-Zarazaga et al. (2017)
125.	*Cyrtogenius philippinensis*		Asia		Alonso-Zarazaga et al. (2017)
126.	*Dendroctonus adjunctus*		North America, Central America		Atkinson (2018)
127.	*Dendroctonus approximatus*		North America, Central America		Atkinson (2018)
128.	*Dendroctonus armandi*		Asia		Alonso-Zarazaga et al. (2017)
129.	*Dendroctonus brevicomis*		North America		Atkinson (2018)
130.	*Dendroctonus frontalis*		North America, Central America		Atkinson (2018)
131.	*Dendroctonus jeffreyi*		North America		Atkinson (2018)
132.	*Dendroctonus mesoamericanus*		North America, Central America		Atkinson (2018)
133.	*Dendroctonus mexicanus*		North America, Central America		Atkinson (2018)
134.	*Dendroctonus murrayanae*		North America		Atkinson (2018)
135.	*Dendroctonus parallelocollis*		North America, Central America		Atkinson (2018)
136.	*Dendroctonus ponderosae*		North America		Atkinson (2018)

ID	Species	Presence in EU MS	Presence outside EU	Comments/ Uncertainties	Reference
137.	*Dendroctonus pseudotsugae barragani*		North America		Atkinson (2018)
138.	*Dendroctonus pseudotsugae pseudotsugae*		North America		Atkinson (2018)
139.	*Dendroctonus punctatus*		North America		Atkinson (2018)
140.	*Dendroctonus rhizophagus*		North America		Atkinson (2018)
141.	*Dendroctonus rufipennis*		North America		Atkinson (2018)
142.	*Dendroctonus simplex*		North America		Atkinson (2018)
143.	*Dendroctonus terebrans*		North America		Atkinson (2018)
144.	*Dendroctonus valens*		North America, Central America, Asia		Atkinson (2018)
145.	*Dendroctonus vitei*		North America, Central America		Atkinson (2018)
146.	*Dolurgus pumilus*		North America		Atkinson (2018)
147.	*Dryocoetes affaber*		North America		Atkinson (2018)
148.	*Dryocoetes baikalicus*		Asia, European Russia,		Alonso-Zarazaga et al. (2017)
149.	*Dryocoetes brevipilosus*		Asia		Alonso-Zarazaga et al. (2017)
150.	*Dryocoetes caryi*		North America		Atkinson (2018)
151.	*Dryocoetes confusus*		North America		Atkinson (2018)
152.	*Dryocoetes cristatus*		Asia		Alonso-Zarazaga et al. (2017)
153.	*Dryocoetes granicollis*		North America		Atkinson (2018)
154.	*Dryocoetes indicus*		Asia		Alonso-Zarazaga et al. (2017)
155.	*Dryocoetes infuscatus*		Asia		Alonso-Zarazaga et al. (2017)
156.	*Dryocoetes karamatsu*		Asia		Alonso-Zarazaga et al. (2017)
157.	*Dryocoetes niijimai*		Asia		Alonso-Zarazaga et al. (2017)
158.	*Dryocoetes pilosus*		Asia		Alonso-Zarazaga et al. (2017)
159.	*Dryocoetes pini*		Asia		Alonso-Zarazaga et al. (2017)
160.	*Dryocoetes quadrisulcatus*		Asia		Alonso-Zarazaga et al. (2017)
161.	*Dryocoetes rugicollis*		Asia		Alonso-Zarazaga et al. (2017)
162.	*Dryocoetes sechelti*		North America		Atkinson (2018)
163.	*Dryocoetes striatus*		Asia		Alonso-Zarazaga et al. (2017)
164.	*Dryocoetes uniseriatus*		Asia		Alonso-Zarazaga et al. (2017)
165.	*Euwallacea barbatus*		Oceania		Wood and Bright (1992)

ID	Species	Presence in EU MS	Presence outside EU	Comments/ Uncertainties	Reference
166.	*Euwallacea interjectus*		North America, Asia		Atkinson (2018)
167.	*Euwallacea validus*		North America, Asia		Atkinson (2018)
168.	*Glostatus acaciae*		Sub-Saharan Africa		Wood and Bright (1992)
169.	*Gnathotrichus deleoni*		North America		Atkinson (2018)
170.	*Gnathotrichus denticulatus*		North America		Atkinson (2018)
171.	*Gnathotrichus imitans*		North America		Atkinson (2018)
172.	*Gnathotrichus nitidifrons*		North America, Central America		Atkinson (2018)
173.	*Gnathotrichus omissus*		Central America		Atkinson (2018)
174.	*Gnathotrichus perniciosus*		North America, Central America		Atkinson (2018)
175.	*Gnathotrichus pilosus*		North America		Atkinson (2018)
176.	*Gnathotrichus retusus*		North America		Atkinson (2018)
177.	*Gnathotrichus sulcatus*		North America, Central America		Atkinson (2018)
178.	*Hylastes ambiguus*		Asia		Alonso-Zarazaga et al. (2017)
179.	*Hylastes asperatus*		North America		Atkinson (2018)
180.	*Hylastes batnensis batnensis*	Italy	Algeria, Morocco	Introduced species	Alonso-Zarazaga et al. (2017) and de Jong et al. (2014)
181.	*Hylastes batnensis anatolicus*		Turkey		Alonso-Zarazaga et al. (2017)
182.	*Hylastes flohri*		North America		Atkinson (2018)
183.	*Hylastes fulgidus*		North America, Central America		Atkinson (2018)
184.	*Hylastes gracilis*		North America, Central America		Atkinson (2018)
185.	*Hylastes longicollis*		North America		Atkinson (2018)
186.	*Hylastes lowei*		North Africa		Alonso-Zarazaga et al. (2017)
187.	*Hylastes macer*		North America		Atkinson (2018)
188.	*Hylastes mexicanus*		North America		Atkinson (2018)
189.	*Hylastes niger*		North America		Atkinson (2018)
190.	*Hylastes nigrinus*		North America		Atkinson (2018)
191.	*Hylastes obscurus*		Asia		Wood and Bright (1992)
192.	*Hylastes parallelus*		Asia		Alonso-Zarazaga et al. (2017)
193.	*Hylastes porculus*		North America		Atkinson (2018)
194.	*Hylastes retifer*		North America		Atkinson (2018)
195.	*Hylastes ruber*		North America		Atkinson (2018)

ID	Species	Presence in EU MS	Presence outside EU	Comments/ Uncertainties	Reference
196.	*Hylastes salebrosus*		North America		Atkinson (2018)
197.	*Hylastes subopacus*		North America		Atkinson (2018)
198.	*Hylastes substriatus*		Asia		Alonso-Zarazaga et al. (2017)
199.	*Hylastes techangensis*		Asia		Alonso-Zarazaga et al. (2017)
200.	*Hylastes tenuis*		North America, Central America		Atkinson (2018)
201.	*Hyledius kesiyae*		Asia		Wood and Bright (1992)
202.	*Hyleops glabratus*		Oceania		Wood and Bright (1992)
203.	*Hylocurus beckeri*		Central America		Wood and Bright (1992)
204.	*Hylocurus rivalis*		North America		Atkinson (2018)
205.	*Hylurdrectonus araucariae*		Oceania		Wood and Bright (1992)
206.	*Hylurdrectonus corticinus*		Oceania		Wood and Bright (1992)
207.	*Hylurdrectonus nanus*		Oceania		Wood and Bright (1992)
208.	*Hylurdrectonus piniarius*		Oceania		Wood and Bright (1992)
209.	*Hylurgonotus antipodus*		South America		Atkinson (2018)
210.	*Hylurgonotus armaticeps*		South America		Atkinson (2018)
211.	*Hylurgonotus solidus*		South America		Atkinson (2018)
212.	*Hylurgonotus tuberculatus*		South America		Atkinson (2018)
213.	*Hylurgops bonvouloiri*		North Africa		Alonso-Zarazaga et al. (2017)
214.	*Hylurgops eusulcatus*		Asia		Alonso-Zarazaga et al. (2017)
215.	*Hylurgops incomptus*		North America, Central America		Atkinson (2018)
216.	*Hylurgops inouyei*		Asia		Alonso-Zarazaga et al. (2017)
217.	*Hylurgops interstitialis*		Asia		Alonso-Zarazaga et al. (2017)
218.	*Hylurgops junnanicus*		Asia		Alonso-Zarazaga et al. (2017)
219.	*Hylurgops knausi*		North America		Atkinson (2018)
220.	*Hylurgops longipillus*		Asia		Alonso-Zarazaga et al. (2017)
221.	*Hylurgops major*		Asia		Alonso-Zarazaga et al. (2017)
222.	*Hylurgops pinifex*		North America		Atkinson (2018)
223.	*Hylurgops planirostris*		North America, Central America		Atkinson (2018)
224.	*Hylurgops porosus*		North America		Atkinson (2018)
225.	*Hylurgops reticulatus*		North America		Atkinson (2018)
226.	*Hylurgops rugipennis*		North America		Atkinson (2018)

ID	Species	Presence in EU MS	Presence outside EU	Comments/ Uncertainties	Reference
227.	*Hylurgops spessiwzeffi*		Asia		Alonso-Zarazaga et al. (2017);
228.	*Hylurgops sulcatus*		Asia		Alonso-Zarazaga et al. (2017)
229.	*Hylurgops tuberculatus*		Asia		Alonso-Zarazaga et al. (2017)
230.	*Hylurgus indicus*		Asia		Alonso-Zarazaga et al. (2017)
231.	*Hypocryphalus caplandicus*		Sub-Saharan Africa		Wood and Bright (1992)
232.	*Hypothenemus crudiae*		North America, Central America, South America, Sub-Saharan Africa		Wood (2007)
233.	*Hypothenemus interstitialis*		North America, Central America, South America		Atkinson (2018) and Wood and Bright (1992)
234.	*Hypothenemus seriatus*		North America, Central America, South America, Asia, North Africa, Sub-Saharan Africa, Oceania		Atkinson (2018)
235.	*Indocryphalus intermedius*		North America, Asia		Alonso-Zarazaga et al. (2017)
236.	*Ips apache*		North America, Central America		Atkinson (2018)
237.	*Ips avulsus*		North America, Central America		Atkinson (2018)
238.	*Ips bonanseai*		North America, Central America		Atkinson (2018)
239.	*Ips borealis borealis*		North America		Atkinson (2018)
240.	*Ips borealis lanieri*		North America		Atkinson (2018)
241.	*Ips borealis swainei*		North America		Atkinson (2018)
242.	*Ips borealis thomasi*		North America		Atkinson (2018)
243.	*Ips calligraphus*		North America, Central America		Atkinson (2018)
244.	*Ips chinensis*		Asia		Alonso-Zarazaga et al. (2017)
245.	*Ips confusus*		North America		Atkinson (2018)
246.	*Ips cribricollis*		North America, Central America		Atkinson (2018)
247.	*Ips emarginatus*		North America		Atkinson (2018)
248.	*Ips grandicollis*		North America, Central America		Atkinson (2018)
249.	*Ips hauseri*		Asia		Alonso-Zarazaga et al. (2017)
250.	*Ips hoppingi*		North America		Atkinson (2018)
251.	*Ips hunteri*		North America		Atkinson (2018)
252.	*Ips integer*		North America, Central America		Atkinson (2018)
253.	*Ips knausi*		North America		Atkinson (2018)
254.	*Ips lecontei*		North America, Central America		Atkinson (2018)

ID	Species	Presence in EU MS	Presence outside EU	Comments/ Uncertainties	Reference
255.	*Ips longifolia*		Asia		Alonso-Zarazaga et al. (2017)
256.	*Ips montanus*		North America		Atkinson (2018)
257.	*Ips nitidus*		Asia		Alonso-Zarazaga et al. (2017)
258.	*Ips paraconfusus*		North America		Atkinson (2018)
259.	*Ips perroti*		North America		Atkinson (2018)
260.	*Ips perturbatus*		North America		Atkinson (2018)
261.	*Ips pilifrons pilifrons*		North America		Atkinson (2018)
262.	*Ips pilifrons sulcifrons*		North America		Atkinson (2018)
263.	*Ips pilifrons thatcheri*		North America		Atkinson (2018)
264.	*Ips pilifrons utahensis*		North America		Atkinson (2018)
265.	*Ips pini*		North America		Atkinson (2018)
266.	*Ips plastographus maritimus*		North America		Atkinson (2018)
267.	*Ips plastographus plastographus*		North America		Atkinson (2018)
268.	*Ips schmutzenhoferi*		Asia		Alonso-Zarazaga et al. (2017)
269.	*Ips shangrila*		Asia		Alonso-Zarazaga et al. (2017)
270.	*Ips stebbingi*		Asia		Alonso-Zarazaga et al. (2017)
271.	*Ips subelongatus*		Asia, European Russia,	Introduced into European Russia from Asia	Alonso-Zarazaga et al. (2017)
272.	*Ips tridens engelmanni*		North America		Atkinson (2018)
273.	*Ips tridens tridens*		North America		Atkinson (2018)
274.	*Ips woodi*		North America		Atkinson (2018)
275.	*Lanurgus oleaeformis*		Sub-Saharan Africa		Wood and Bright (1992)
276.	*Lanurgus podocarpi*		Sub-Saharan Africa		Wood and Bright (1992)
277.	*Lanurgus spathulatus*		Sub-Saharan Africa		Wood and Bright (1992)
278.	*Lanurgus widdringtoniae*		Sub-Saharan Africa		Wood and Bright (1992)
279.	*Liparthrum longifolia*		Asia		Alonso-Zarazaga et al. (2017)
280.	*Microperus eucalypticus*		Oceania		Bright (2014)
281.	*Microperus intermedius*		Oceania		Bright (2014)
282.	*Monarthrum nevermanni*		Central America		Atkinson (2018)
283.	*Orthotomicus angulatus*		Asia, Oceania		Alonso-Zarazaga et al. (2017)

ID	Species	Presence in EU MS	Presence outside EU	Comments/ Uncertainties	Reference
284.	*Orthotomicus caelatus*		North America, Central America		Atkinson (2018)
285.	*Orthotomicus chaokhao*		Asia		Bright (2014)
286.	*Orthotomicus golovjankoi*		Asia		Alonso-Zarazaga et al. (2017)
287.	*Orthotomicus kuniyoshii*		Asia		Alonso-Zarazaga et al. (2017)
288.	*Orthotomicus latidens*		North America		Atkinson (2018)
289.	*Orthotomicus multidentatus*		Asia		Alonso-Zarazaga et al. (2017)
290.	*Orthotomicus nankinensis*		Asia		Alonso-Zarazaga et al. (2017)
291.	*Orthotomicus nobilis*		North Africa		Alonso-Zarazaga et al. (2017)
292.	*Orthotomicus pinivorus*		Asia		Alonso-Zarazaga et al. (2017)
293.	*Orthotomicus spinifer*		North America		Atkinson (2018)
294.	*Orthotomicus tosaensis*		Asia		Alonso-Zarazaga et al. (2017)
295.	*Orthotomicus tridentatus*	Austria	Turkey		Alonso-Zarazaga et al. (2017) and de Jong et al. (2014)
296.	*Pachycotes araucariae*		Oceania		Wood and Bright (1992)
297.	*Pachycotes australis*		Oceania		Wood and Bright (1992)
298.	*Pachycotes clavatus*		Oceania		Wood and Bright (1992)
299.	*Pachycotes engelsi*		Oceania		Bright (2014)
300.	*Pachycotes grandis*		Oceania		Bright (2014)
301.	*Pachycotes kuscheli*		Oceania		Wood and Bright (1992)
302.	*Pachycotes minor*		Oceania		Wood and Bright (1992)
303.	*Pachycotes peregrinus*		Oceania		Wood and Bright (1992)
304.	*Pachycotes villosus*		Oceania		Wood and Bright (1992)
305.	*Pachysquamus subcostulatus*		North America		Mercado-Velez and Negron (2014)
306.	*Pagiocerus punctatus*		South America		Atkinson (2018)
307.	*Phloeosinus abietis*		Asia		Alonso-Zarazaga et al. (2017)
308.	*Phloeosinus acatayi*		Asia		Alonso-Zarazaga et al. (2017)
309.	*Phloeosinus antennatus*		North America		Atkinson (2018)
310.	*Phloeosinus arisanus*		Asia		Alonso-Zarazaga et al. (2017)
311.	*Phloeosinus arizonicus*		North America		Atkinson (2018)
312.	*Phloeosinus armatus*	Greece, Italy, Cyprus	Turkey, Libya, Iran, Israel, Jordan, Lebanon, Syria		Alonso-Zarazaga et al. (2017), de Jong et al. (2014) and Pennachio et al. (2013)

ID	Species	Presence in EU MS	Presence outside EU	Comments/ Uncertainties	Reference
313.	*Phloeosinus baumanni*		North America, Central America		Atkinson (2018)
314.	*Phloeosinus canadensis*		North America		Atkinson (2018)
315.	*Phloeosinus cedri*	Spain	Turkey, Algeria, Morocco, India	Introduced species	Alonso-Zarazaga et al. (2017) and de Jong et al. (2014)
316.	*Phloeosinus cristatus*		North America		Atkinson (2018)
317.	*Phloeosinus cupressi*		North America, Central America		Atkinson (2018)
318.	*Phloeosinus deleoni*		North America		Atkinson (2018)
319.	*Phloeosinus dentatus*		North America		Atkinson (2018)
320.	*Phloeosinus frontalis*		North America		Atkinson (2018)
321.	*Phloeosinus fulgens*		North America		Wood and Bright (1992)
322.	*Phloeosinus furnissi*		North America		Atkinson (2018)
323.	*Phloeosinus gifuensis*		Asia		Alonso-Zarazaga et al. (2017)
324.	*Phloeosinus gillerforsi*	Azores (Portugal)	Canary Islands[(a)]		Alonso-Zarazaga et al. (2017) and de Jong et al. (2014)
325.	*Phloeosinus hoferi*		North America, Asia		Atkinson (2018)
326.	*Phloeosinus hopehi*		Asia		Wood and Bright (1992)
327.	*Phloeosinus hoppingi*		North America		Atkinson (2018)
328.	*Phloeosinus jubatus*		Asia		Alonso-Zarazaga et al. (2017)
329.	*Phloeosinus keeni*		North America		Atkinson (2018)
330.	*Phloeosinus kinabaluensis*		Asia		Wood and Bright (1992)
331.	*Phloeosinus lewisi*		Asia		Alonso-Zarazaga et al. (2017)
332.	*Phloeosinus osumiensis*		Asia		Alonso-Zarazaga et al. (2017)
333.	*Phloeosinus palearis*		North America		Atkinson (2018)
334.	*Phloeosinus perlatus*		Asia		Alonso-Zarazaga et al. (2017)
335.	*Phloeosinus pertuberculatus*		Asia		Alonso-Zarazaga et al. (2017)
336.	*Phloeosinus phyllocladus*		Asia		Wood and Bright (1992)
337.	*Phloeosinus pini*		North America		Atkinson (2018)
338.	*Phloeosinus podocarpi*		Asia		Wood and Bright (1992)
339.	*Phloeosinus punctatus*		North America		Atkinson (2018)
340.	*Phloeosinus sannohensis*		Asia		Alonso-Zarazaga et al. (2017)
341.	*Phloeosinus scopulorum neomexicanus*		North America		Atkinson (2018)

ID	Species	Presence in EU MS	Presence outside EU	Comments/ Uncertainties	Reference
342.	*Phloeosinus scopulorum scopulorum*		North America		Atkinson (2018)
343.	*Phloeosinus sequoiae*		North America		Atkinson (2018)
344.	*Phloeosinus seriatus*		Asia		Wood and Bright (1992)
345.	*Phloeosinus serratus*		North America, Central America		Atkinson (2018)
346.	*Phloeosinus setosus*		North America		Atkinson (2018)
347.	*Phloeosinus shensi*		Asia		Alonso-Zarazaga et al. (2017)
348.	*Phloeosinus sinensis*		Asia		Bright and Skidmore (2002)
349.	*Phloeosinus spinosus*		North America		Atkinson (2018)
350.	*Phloeosinus swainei*		North America		Atkinson (2018)
351.	*Phloeosinus tacubayae*		North America, Central America		Atkinson (2018)
352.	*Phloeosinus taxodii*		North America		Atkinson (2018)
353.	*Phloeosinus turkestanicus*		Asia		Alonso-Zarazaga et al. (2017)
354.	*Phloeosinus variolatus*		North America		Atkinson (2018)
355.	*Phloeotribus argentinensis*		South America		Atkinson (2018)
356.	*Phloeotribus atavus*		Central America		Atkinson (2018)
357.	*Phloeotribus cylindricus*		South America		Atkinson (2018)
358.	*Phloeotribus lecontei*		North America		Atkinson (2018)
359.	*Phloeotribus piceae*		North America		Wood and Bright (1992)
360.	*Pityoborus comatus*		North America, Central America		Atkinson (2018)
361.	*Pityoborus frontalis*		North America		Atkinson (2018)
362.	*Pityoborus hirtellus*		North America		Atkinson (2018)
363.	*Pityoborus hondurensis*		Central America		Atkinson (2018)
364.	*Pityoborus rubentis*		North America		Atkinson (2018)
365.	*Pityoborus secundus*		North America		Atkinson (2018)
366.	*Pityoborus velutinus*		North America		Atkinson (2018)
367.	*Pityogenes carinulatus*		North America		Atkinson (2018)
368.	*Pityogenes fossifrons*		North America		Atkinson (2018)
369.	*Pityogenes foveolatus*		Asia		Alonso-Zarazaga et al. (2017)
370.	*Pityogenes hopkinsi*		North America		Atkinson (2018)
371.	*Pityogenes japonicus*		Asia		Alonso-Zarazaga et al. (2017)

ID	Species	Presence in EU MS	Presence outside EU	Comments/ Uncertainties	Reference
372.	*Pityogenes knechteli*		North America		Atkinson (2018)
373.	*Pityogenes meridianus*		North America		Atkinson (2018)
374.	*Pityogenes mexicanus*		North America		Atkinson (2018)
375.	*Pityogenes pennidens*	Greece, Cyprus	Russia, Israel, Syria		Alonso-Zarazaga et al. (2017) and de Jong et al. (2014)
376.	*Pityogenes plagiatus*		North America		Atkinson (2018)
377.	*Pityogenes rudnevi*		Asia		Alonso-Zarazaga et al. (2017)
378.	*Pityogenes scitus*		Asia		Alonso-Zarazaga et al. (2017)
379.	*Pityogenes seirindensis*		Asia		Alonso-Zarazaga et al. (2017)
380.	*Pityogenes spessivtsevi*		Asia		Alonso-Zarazaga et al. (2017)
381.	*Pityokteines elegans*		North America		Atkinson (2018)
382.	*Pityokteines lasiocarpi*		North America		Atkinson (2018)
383.	*Pityokteines marketae*		Asia		Alonso-Zarazaga et al. (2017)
384.	*Pityokteines minutus*		North America		Atkinson, 2018;
385.	*Pityokteines mystacinus*		North America		Atkinson (2018)
386.	*Pityokteines ornatus*		North America		Atkinson (2018)
387.	*Pityokteines sparsus*		North America		Atkinson (2018)
388.	*Pityophthorus abiegnus*		North America		Atkinson (2018)
389.	*Pityophthorus abietinus*		Asia		Alonso-Zarazaga et al. (2017)
390.	*Pityophthorus absonus*		North America		Atkinson (2018)
391.	*Pityophthorus abstrusus*		North America		Atkinson (2018)
392.	*Pityophthorus aciculatus*		North America, Central America		Atkinson (2018)
393.	*Pityophthorus acuminatus*		North America, Central America		Atkinson (2018)
394.	*Pityophthorus acutus*		North America		Atkinson (2018)
395.	*Pityophthorus alpinensis*		North America		Atkinson (2018)
396.	*Pityophthorus amoenus*		Central America		Atkinson (2018)
397.	*Pityophthorus amplus*		North America		Atkinson (2018)
398.	*Pityophthorus angustus*		North America		Atkinson (2018)
399.	*Pityophthorus annectens*		North America, Central America		Atkinson (2018)
400.	*Pityophthorus anthracinus*		North America		Atkinson (2018)
401.	*Pityophthorus anticus*		South America		Atkinson (2018)

ID	Species	Presence in EU MS	Presence outside EU	Comments/ Uncertainties	Reference
402.	*Pityophthorus apachae*		North America		Atkinson (2018)
403.	*Pityophthorus aquilus*		North America		Atkinson (2018)
404.	*Pityophthorus arakii*		Asia		Alonso-Zarazaga et al. (2017)
405.	*Pityophthorus arcanus*		North America		Atkinson (2018)
406.	*Pityophthorus aztecus*		North America		Atkinson (2018)
407.	*Pityophthorus balsameus*		North America		Atkinson (2018)
408.	*Pityophthorus barberi*		North America		Atkinson (2018)
409.	*Pityophthorus bassetti*		North America		Atkinson (2018)
410.	*Pityophthorus biovalis*		North America		Atkinson (2018)
411.	*Pityophthorus blackmani*		Central America		Atkinson (2018)
412.	*Pityophthorus blandulus*		North America, Central America		Atkinson (2018)
413.	*Pityophthorus blandus*		North America		Atkinson (2018)
414.	*Pityophthorus boycei*		North America		Atkinson (2018)
415.	*Pityophthorus bravoi*		North America		Atkinson (2018)
416.	*Pityophthorus brevicomatus*		North America		Atkinson (2018)
417.	*Pityophthorus brevis*		North America		Atkinson (2018)
418.	*Pityophthorus brighti*		North America		Atkinson (2018)
419.	*Pityophthorus briscoei*		North America		Atkinson (2018)
420.	*Pityophthorus cacuminatus*		North America, Central America		Atkinson (2018)
421.	*Pityophthorus californicus*		North America		Atkinson (2018)
422.	*Pityophthorus carinatus carinatus*		North America		Atkinson (2018)
423.	*Pityophthorus carinatus monticolae*		North America		Atkinson (2018)
424.	*Pityophthorus cariniceps*		North America		Atkinson (2018)
425.	*Pityophthorus carinulatus*		North America		Atkinson (2018)
426.	*Pityophthorus carmeli*		North America		Atkinson (2018)
427.	*Pityophthorus cascoensis*		North America		Atkinson (2018)
428.	*Pityophthorus cavatus*		North America		Atkinson (2018)
429.	*Pityophthorus cedri*		Asia		Alonso-Zarazaga et al. (2017)
430.	*Pityophthorus chalcoensis*		North America		Atkinson (2018)

ID	Species	Presence in EU MS	Presence outside EU	Comments/ Uncertainties	Reference
431.	*Pityophthorus chilgoza*		Asia		Alonso-Zarazaga et al. (2017)
432.	*Pityophthorus ciliatus*		North America		Atkinson (2018)
433.	*Pityophthorus clarus*		North America		Atkinson (2018)
434.	*Pityophthorus clivus*		North America		Atkinson (2018)
435.	*Pityophthorus comosus*		North America		Atkinson (2018)
436.	*Pityophthorus concavus*		North America		Atkinson (2018)
437.	*Pityophthorus confertus*		North America		Atkinson (2018)
438.	*Pityophthorus confinis*		North America		Atkinson (2018)
439.	*Pityophthorus confusus*		North America, Central America		Atkinson (2018)
440.	*Pityophthorus consimilis*		North America		Atkinson (2018)
441.	*Pityophthorus cortezi*		North America		Atkinson (2018)
442.	*Pityophthorus crassus*		North America		Atkinson (2018)
443.	*Pityophthorus cristatus*		North America		Atkinson (2018)
444.	*Pityophthorus culminicolae*		North America		Atkinson (2018)
445.	*Pityophthorus cuspidatus*		North America		Atkinson (2018)
446.	*Pityophthorus declivisetosus*		North America		Atkinson (2018)
447.	*Pityophthorus deleoni*		North America		Atkinson (2018)
448.	*Pityophthorus deletus*		North America		Atkinson (2018)
449.	*Pityophthorus delicatus*		North America, Central America		Atkinson (2018)
450.	*Pityophthorus dentifrons*		North America		Atkinson (2018)
451.	*Pityophthorus deodara*		Asia		Alonso-Zarazaga et al. (2017)
452.	*Pityophthorus digestus*		North America		Atkinson (2018)
453.	*Pityophthorus diglyphus*		North America, Central America		Atkinson (2018)
454.	*Pityophthorus discretus*		North America		Atkinson (2018)
455.	*Pityophthorus dispar*		North America		Atkinson (2018)
456.	*Pityophthorus dolus*		North America		Atkinson (2018)
457.	*Pityophthorus durus*		North America		Atkinson (2018)
458.	*Pityophthorus elatinus*		North America		Atkinson (2018)
459.	*Pityophthorus electus*		North America		Atkinson (2018)
460.	*Pityophthorus euterpes*		North America		Atkinson (2018)
461.	*Pityophthorus festus*		North America, Central America		Atkinson (2018)

ID	Species	Presence in EU MS	Presence outside EU	Comments/ Uncertainties	Reference
462.	*Pityophthorus flavimaculatus*		Asia		Alonso-Zarazaga et al. (2017)
463.	*Pityophthorus furnissi*		North America		Atkinson (2018)
464.	*Pityophthorus fuscus*		North America		Atkinson (2018)
465.	*Pityophthorus glabratulus*		North America, Central America		Atkinson (2018)
466.	*Pityophthorus grandis*		North America		Atkinson (2018)
467.	*Pityophthorus immanis*		North America		Atkinson (2018)
468.	*Pityophthorus impexus*		North America		Atkinson (2018)
469.	*Pityophthorus indigus*		North America		Atkinson (2018)
470.	*Pityophthorus ineditus*		North America		Atkinson (2018)
471.	*Pityophthorus infulatus*		North America		Atkinson (2018)
472.	*Pityophthorus ingens*		North America		Atkinson (2018)
473.	*Pityophthorus intentus*		North America		Atkinson (2018)
474.	*Pityophthorus intextus*		North America		Atkinson (2018)
475.	*Pityophthorus jeffreyi*		North America		Atkinson (2018)
476.	*Pityophthorus jucundus*		Asia		Alonso-Zarazaga et al. (2017)
477.	*Pityophthorus keeni*		North America		Atkinson (2018)
478.	*Pityophthorus kirgisicus*		Asia		Alonso-Zarazaga et al. (2017)
479.	*Pityophthorus lapponicus*		Asia, Asian Russia	NPPO of Finland confirmed that the species does not occur in Finland	Alonso-Zarazaga et al. (2017)
480.	*Pityophthorus laticeps*		North America		Atkinson (2018)
481.	*Pityophthorus lautus*		North America		Atkinson (2018)
482.	*Pityophthorus lecontei*		North America		Atkinson (2018)
483.	*Pityophthorus leechi*		North America		Atkinson (2018)
484.	*Pityophthorus leiophyllae*		North America		Atkinson (2018)
485.	*Pityophthorus lepidus*		North America		Atkinson (2018)
486.	*Pityophthorus levis*		North America		Atkinson (2018)
487.	*Pityophthorus litos*		North America		Atkinson (2018)
488.	*Pityophthorus malleatus*		North America		Atkinson (2018)

ID	Species	Presence in EU MS	Presence outside EU	Comments/ Uncertainties	Reference
489.	*Pityophthorus mauretanicus*	France	Algeria, Egypt, Libya, Morocco, Tunisia	FR NPPO: species from North Africa, mistakenly cited from France in the Catalogue of Palaearctic Coleoptera.	Alonso-Zarazaga et al. (2017) and de Jong et al. (2014)
490.	*Pityophthorus megas*		North America		Atkinson (2018)
491.	*Pityophthorus mesembria*		Central America		Atkinson (2018)
492.	*Pityophthorus micans*		North America		Atkinson (2018)
493.	*Pityophthorus micrographus sibiricus*		Asia		Alonso-Zarazaga et al. (2017)
494.	*Pityophthorus miniatus*		North America, Central America		Atkinson (2018)
495.	*Pityophthorus modicus*		North America		Atkinson (2018)
496.	*Pityophthorus montezumae*		North America		Atkinson (2018)
497.	*Pityophthorus montivagus*		North America		Atkinson (2018)
498.	*Pityophthorus mormon*		North America		Atkinson (2018)
499.	*Pityophthorus murrayanae*		North America		Atkinson (2018)
500.	*Pityophthorus nigricans*		North America, Central America		Atkinson (2018)
501.	*Pityophthorus nitidulus*		North America		Atkinson (2018)
502.	*Pityophthorus nitidus*		North America		Atkinson (2018)
503.	*Pityophthorus nocturnus*		North America, Central America		Atkinson (2018)
504.	*Pityophthorus obtusipennis*		North America, Central America		Atkinson (2018)
505.	*Pityophthorus occidentalis*		North America		Atkinson (2018)
506.	*Pityophthorus occlusus*		North America, Central America		Atkinson (2018)
507.	*Pityophthorus opaculus*		North America		Atkinson (2018)
508.	*Pityophthorus orarius*		North America		Atkinson (2018)
509.	*Pityophthorus ornatus*		North America		Atkinson (2018)
510.	*Pityophthorus parfentievi*		Asia		Alonso-Zarazaga et al. (2017)
511.	*Pityophthorus pellitus*		North America, Central America		Atkinson (2018)
512.	*Pityophthorus perotei*		North America		Atkinson (2018)
513.	*Pityophthorus pinavorus*		North America, Central America		Atkinson (2018)
514.	*Pityophthorus pinguis*		North America		Atkinson (2018)
515.	*Pityophthorus pini*		Asia		Alonso-Zarazaga et al. (2017)

ID	Species	Presence in EU MS	Presence outside EU	Comments/ Uncertainties	Reference
516.	*Pityophthorus pityographus cribratus*	Greece	Russia, Turkey		Alonso-Zarazaga et al. (2017) and de Jong et al. (2014)
517.	*Pityophthorus podocarpi*		South America		Atkinson (2018)
518.	*Pityophthorus pseudotsugae*		North America		Atkinson (2018)
519.	*Pityophthorus puberulus*		North America		Atkinson (2018)
520.	*Pityophthorus pubifrons*		North America		Atkinson (2018)
521.	*Pityophthorus pulchellus*		North America		Atkinson (2018)
522.	*Pityophthorus pulicarius*		North America, Central America		Atkinson (2018)
523.	*Pityophthorus pullus*		North America		Atkinson (2018)
524.	*Pityophthorus punctifrons*		North America		Atkinson (2018)
525.	*Pityophthorus ramiperda*		North America		Atkinson (2018)
526.	*Pityophthorus recens*		North America		Atkinson (2018)
527.	*Pityophthorus rubidus*		North America		Atkinson (2018)
528.	*Pityophthorus rudis*		North America		Atkinson (2018)
529.	*Pityophthorus sachalinensis*		Asia		Alonso-Zarazaga et al. (2017)
530.	*Pityophthorus sapineus*		North America		Atkinson (2018)
531.	*Pityophthorus scabridus*		North America, Central America		Atkinson (2018)
532.	*Pityophthorus scalptor*		North America		Atkinson (2018)
533.	*Pityophthorus scalptus*		North America		Atkinson (2018)
534.	*Pityophthorus schwarzi*		North America		Atkinson (2018)
535.	*Pityophthorus schwerdtfegeri*		North America, Central America		Atkinson (2018)
536.	*Pityophthorus segnis*		North America		Atkinson (2018)
537.	*Pityophthorus seiryuensis*		Asia		Alonso-Zarazaga et al. (2017)
538.	*Pityophthorus serratus*		North America		Atkinson (2018)
539.	*Pityophthorus setosus*		North America		Atkinson (2018)
540.	*Pityophthorus sichotensis*		Asia		Alonso-Zarazaga et al. (2017)
541.	*Pityophthorus sierrensis*		North America		Atkinson (2018)
542.	*Pityophthorus solatus*		North America		Atkinson (2018)
543.	*Pityophthorus solers*		North America		Atkinson (2018)
544.	*Pityophthorus solus*	Spain	North America	Introduced species	Alonso-Zarazaga et al. (2017)
545.	*Pityophthorus spadix*		North America		Atkinson (2018)

ID	Species	Presence in EU MS	Presence outside EU	Comments/ Uncertainties	Reference
546.	*Pityophthorus speculum*		North America		Atkinson (2018)
547.	*Pityophthorus subopacus*		North America		Atkinson (2018)
548.	*Pityophthorus subsimilis*		North America, Central America		Atkinson (2018)
549.	*Pityophthorus thomasi*		North America		Atkinson (2018)
550.	*Pityophthorus toralis*		North America		Atkinson (2018)
551.	*Pityophthorus trepidus*		North America		Atkinson (2018)
552.	*Pityophthorus tuberculatus*		North America		Atkinson (2018)
553.	*Pityophthorus tumidus*		North America		Atkinson (2018)
554.	*Pityophthorus venustus*		North America		Atkinson (2018)
555.	*Pityophthorus vespertinus*		North America		Atkinson (2018)
556.	*Pityophthorus viminalis*		North America		Atkinson (2018)
557.	*Pityophthorus woodi*		North America		Atkinson (2018)
558.	*Pityophthorus zonalis*		North America		Atkinson (2018)
559.	*Pityotrichus barbatus*		North America		Atkinson (2018)
560.	*Pityotrichus hesperius*		North America		Atkinson (2018)
561.	*Pityotrichus turkmenicus*		Asia		Alonso-Zarazaga et al. (2017)
562.	*Polygraphus abietis*		Asia		Alonso-Zarazaga et al. (2017)
563.	*Polygraphus angustus*		Asia		Alonso-Zarazaga et al. (2017)
564.	*Polygraphus aterrimus*		Asia		Alonso-Zarazaga et al. (2017)
565.	*Polygraphus convexifrons*		North America		Atkinson (2018)
566.	*Polygraphus difficilis*		Asia		Alonso-Zarazaga et al. (2017)
567.	*Polygraphus formosanus*		Asia		Wood and Bright (1992)
568.	*Polygraphus fulvipennis*		Asia		Alonso-Zarazaga et al. (2017)
569.	*Polygraphus gracilis*		Asia		Alonso-Zarazaga et al. (2017)
570.	*Polygraphus hoppingi*		North America		Atkinson (2018)
571.	*Polygraphus horyurensis*		Asia		Alonso-Zarazaga et al. (2017)
572.	*Polygraphus japonicus*		Asia		Alonso-Zarazaga et al. (2017)
573.	*Polygraphus jezoensis*		Asia		Alonso-Zarazaga et al. (2017)
574.	*Polygraphus junnanicus*		Asia		Alonso-Zarazaga et al. (2017)
575.	*Polygraphus kisoensis*		Asia		Alonso-Zarazaga et al. (2017)
576.	*Polygraphus longifolia*		Asia		Maiti and Saha (2004)

ID	Species	Presence in EU MS	Presence outside EU	Comments/ Uncertainties	Reference
577.	*Polygraphus major*		Asia		Alonso-Zarazaga et al. (2017)
578.	*Polygraphus meakanensis*		Asia		Alonso-Zarazaga et al. (2017)
579.	*Polygraphus nobuchii*		Asia		Alonso-Zarazaga et al. (2017)
580.	*Polygraphus pini*		Asia		Alonso-Zarazaga et al. (2017)
581.	*Polygraphus proximus*		Russia, Asia	Introduced species	Alonso-Zarazaga et al. (2017)
582.	*Polygraphus rudis rudis*		Asia		Alonso-Zarazaga et al. (2017)
583.	*Polygraphus rudis hexiensis*		Asia		Alonso-Zarazaga et al. (2017)
584.	*Polygraphus rufipennis*		North America		Atkinson (2018)
585.	*Polygraphus setosus*		Asia		Alonso-Zarazaga et al. (2017)
586.	*Polygraphus sinensis*		Asia		Alonso-Zarazaga et al. (2017)
587.	*Polygraphus squamulatus*		Asia		Alonso-Zarazaga et al. (2017)
588.	*Polygraphus sumatranus*		Asia		Wood and Bright (1992)
589.	*Polygraphus szemaoensis*		Asia		Alonso-Zarazaga et al. (2017)
590.	*Polygraphus taiwanensis*		Asia		Alonso-Zarazaga et al. (2017)
591.	*Polygraphus trenchi*		Asia		Alonso-Zarazaga et al. (2017)
592.	*Polygraphus verrucifrons*		Asia		Alonso-Zarazaga et al. (2017)
593.	*Pseudips concinnus*		North America		Atkinson (2018)
594.	*Pseudips orientalis*[(b)]		Asia		Alonso-Zarazaga et al. (2017)
595.	*Pseudips mexicanus*		North America, Central America		Atkinson (2018)
596.	*Pseudohylesinus dispar dispar*		North America		Atkinson (2018)
597.	*Pseudohylesinus dispar pullatus*		North America		Atkinson (2018)
598.	*Pseudohylesinus granulatus*		North America		Atkinson (2018)
599.	*Pseudohylesinus maculosus*		North America		Atkinson (2018)
600.	*Pseudohylesinus magnus*		North America		Atkinson (2018)
601.	*Pseudohylesinus nebulosus nebulosus*		North America		Atkinson (2018)
602.	*Pseudohylesinus nebulosus serratus*		North America		Atkinson (2018)
603.	*Pseudohylesinus nobilis*		North America		Atkinson (2018)
604.	*Pseudohylesinus pini*		North America		Atkinson (2018)

ID	Species	Presence in EU MS	Presence outside EU	Comments/ Uncertainties	Reference
605.	*Pseudohylesinus sericeus*		North America, Asia		Atkinson (2018)
606.	*Pseudohylesinus sitchensis*		North America		Atkinson (2018)
607.	*Pseudohylesinus tsugae*		North America		Atkinson (2018)
608.	*Pseudohylesinus variegatus*		North America		Atkinson (2018)
609.	*Pseudothysanoes coniferae*		North America		Atkinson (2018)
610.	*Pseudothysanoes pini*		North America		Atkinson (2018)
611.	*Pseudoxylechinus piceae*		Asia		Alonso-Zarazaga et al. (2017)
612.	*Scierus annectans*		North America		Atkinson (2018)
613.	*Scierus pubescens*		North America		Atkinson (2018)
614.	*Scolytodes gennaeus*		South America		Atkinson (2018)
615.	*Scolytoplatypus daimio*		Asia		Alonso-Zarazaga et al. (2017)
616.	*Scolytoplatypus kivuensis*		Sub-Saharan Africa		Wood and Bright (1992)
617.	*Scolytoplatypus nitidus*		Asia		Wood and Bright (1992)
618.	*Scolytoplatypus pusillus*		Asia		Wood and Bright (1992)
619.	*Scolytoplatypus raja*		Asia		Alonso-Zarazaga et al. (2017)
620.	*Scolytoplatypus shogun*		Asia		Wood and Bright (1992)
621.	*Scolytoplatypus siomio*		Asia		Maiti and Saha (2004)
622.	*Scolytoplatypus tycoon*		Asia		Alonso-Zarazaga et al. (2017)
623.	*Scolytus aztecus*		North America		Atkinson (2018)
624.	*Scolytus dentatus*		North America		Atkinson (2018)
625.	*Scolytus fiskei*		North America		Atkinson (2018)
626.	*Scolytus hermosus*		North America		Atkinson (2018)
627.	*Scolytus laricis*		North America		Atkinson (2018)
628.	*Scolytus major*		Asia		Alonso-Zarazaga et al. (2017)
629.	*Scolytus monticolae*		North America		Atkinson (2018)
630.	*Scolytus morawitzi*		Russia, Asia		Alonso-Zarazaga et al. (2017)
631.	*Scolytus mundus*		North America		Atkinson (2018)
632.	*Scolytus numidicus*		North Africa		Alonso-Zarazaga et al. (2017)
633.	*Scolytus obelus*		North America		Atkinson (2018)
634.	*Scolytus oregoni*		North America		Atkinson (2018)
635.	*Scolytus piceae*		North America		Atkinson (2018)

ID	Species	Presence in EU MS	Presence outside EU	Comments/ Uncertainties	Reference
636.	*Scolytus praeceps*		North America		Atkinson (2018)
637.	*Scolytus reflexus*		North America		Atkinson (2018)
638.	*Scolytus robustus*		North America		Atkinson (2018)
639.	*Scolytus sinopiceus*		Asia		Alonso-Zarazaga et al. (2017)
640.	*Scolytus subscaber*		North America		Atkinson (2018)
641.	*Scolytus tsugae*		North America		Atkinson (2018)
642.	*Scolytus unispinosus*		North America		Atkinson (2018)
643.	*Scolytus ventralis*		North America		Atkinson (2018)
644.	*Scolytus virgatus*		North America		Atkinson (2018)
645.	*Sphaerotrypes magnus*		Asia		Alonso-Zarazaga et al. (2017)
646.	*Sphaerotrypes tsugae*		Asia		Alonso-Zarazaga et al. (2017)
647.	*Sternobothrus costatus*		South America		Atkinson (2018)
648.	*Sternobothrus suturalis*		South America		Atkinson (2018)
649.	*Tomicus armandii*		Asia		Alonso-Zarazaga et al. (2017)
650.	*Tomicus brevipilosus*		Asia		Alonso-Zarazaga et al. (2017)
651.	*Tomicus pilifer*		Asia		Alonso-Zarazaga et al. (2017)
652.	*Tomicus puellus*		Asia		Alonso-Zarazaga et al. (2017)
653.	*Tomicus yunnanensis*		Asia		Alonso-Zarazaga et al. (2017)
654.	*Traglostus brevisetosus*		Sub-Saharan Africa		Wood and Bright (1992)
655.	*Trypodendron dorjitenzingi*		Asia		Alonso-Zarazaga et al. (2017)
656.	*Trypodendron gaimaensis*		Asia		Alonso-Zarazaga et al. (2017)
657.	*Trypodendron proximum*		Asia		Alonso-Zarazaga et al. (2017)
658.	*Trypodendron rufitarsus*		North America		Atkinson (2018)
659.	*Trypodendron scabricollis*		North America		Atkinson (2018)
660.	*Xyleborinus gracilis*	Azores (Portugal)	North America, Central America, South America	Introduced species	Atkinson (2018) and Alonso-Zarazaga et al. (2017)
661.	*Xyleborinus linearicollis*		South America		Atkinson (2018)
662.	*Xyleborinus sentosus*		South America		Wood and Bright (1992)
663.	*Xyleborinus sharpae*		Sub-Saharan Africa		Wood and Bright (1992)
664.	*Xyleborinus spinifer*		Sub-Saharan Africa		Wood and Bright (1992)
665.	*Xyleborus adelographus*		South America		Atkinson (2018)

ID	Species	Presence in EU MS	Presence outside EU	Comments/ Uncertainties	Reference
666.	*Xyleborus agathis*		Asia		Wood and Bright (1992)
667.	*Xyleborus apertus*		Asia, Oceania		Wood and Bright (1992)
668.	*Xyleborus aquilus*		Asia		Alonso-Zarazaga et al. (2017)
669.	*Xyleborus bidentatus*		Asia, Sub-Saharan Africa, Oceania		Wood and Bright (1992)
670.	*Xyleborus catharinensis*		South America		Atkinson (2018)
671.	*Xyleborus compressus*		Oceania		Wood and Bright (1992)
672.	*Xyleborus detectus*		Asia		Wood and Bright (1992)
673.	*Xyleborus emarginatus*		Asia		Alonso-Zarazaga et al. (2017)
674.	*Xyleborus ferrugineus*		North America, Central America, South America, Asia, Sub-Saharan Africa, Oceania		Atkinson (2018)
675.	*Xyleborus festivus*		Asia		Alonso-Zarazaga et al. (2017)
676.	*Xyleborus gratiosus*		Oceania		Wood and Bright (1992)
677.	*Xyleborus intrusus*		North America, Central America		Atkinson (2018)
678.	*Xyleborus muticus*		Asia		Alonso-Zarazaga et al. (2017)
679.	*Xyleborus neivai*		South America		Atkinson (2018)
680.	*Xyleborus perforans*	Azores (Portugal)	North America, Central America, South America, Asia, North Africa, Sub-Saharan Africa, Oceania		Alonso-Zarazaga et al. (2017)
681.	*Xyleborus perplexus*		Oceania		Wood and Bright (1992)
682.	*Xyleborus pinicola*		Asia		Wood and Bright (1992)
683.	*Xyleborus pubescens*		North America, Central America		Atkinson (2018)
684.	*Xyleborus septentrionalis*		Asia		Alonso-Zarazaga et al. (2017)
685.	*Xyleborus seriatus*		North America, Asia		Alonso-Zarazaga et al. (2017)
686.	*Xyleborus spinulosus*		North America, Central America, South America		Atkinson (2018)
687.	*Xyleborus squamulatus*		North America, Central America, South America		Atkinson (2018)
688.	*Xyleborus volvulus*		North America, Central America, South America, Asia, Sub-Saharan Africa, Oceania		Atkinson (2018)
689.	*Xylechinosomus bicolor*		South America		Atkinson (2018)

ID	Species	Presence in EU MS	Presence outside EU	Comments/ Uncertainties	Reference
690.	*Xylechinosomus brasiliensis*		South America		Atkinson (2018)
691.	*Xylechinosomus contractus*		South America		Atkinson (2018)
692.	*Xylechinosomus hirsutus*		South America		Atkinson (2018)
693.	*Xylechinosomus humilus*		South America		Atkinson (2018)
694.	*Xylechinosomus lucianae*		South America		Atkinson (2018)
695.	*Xylechinosomus minimus*		South America		Atkinson (2018)
696.	*Xylechinosomus paranaensis*		South America		Atkinson (2018)
697.	*Xylechinosomus pilosus*		South America		Atkinson (2018)
698.	*Xylechinosomus sachtlebeni*		South America		Atkinson (2018)
699.	*Xylechinosomus valdivianus*		South America		Atkinson (2018)
700.	*Xylechinus americanus*		South America		Atkinson (2018)
701.	*Xylechinus araucariae*		Oceania		Bright (2014)
702.	*Xylechinus montanus*		North America		Atkinson (2018)
703.	*Xylosandrus compactus*	Italy, France, Greece	North America, Central America, South America, Asia, Sub-Saharan Africa		Wood and Bright (1992), Wood (2007), Garonna et al. (2012), Anses (2017) and Spanou et al. (2019)
704.	*Xylosandrus pseudosolidus*		Oceania		Wood and Bright (1992)
705.	*Xyloterinus politus*		North America		Wood and Bright (1992)

(a): In the sense of phytosanitary terms, in line with Article 1 point 3 of Regulation (EU) 2016/2031, the Canary Islands are considered as Third Countries though they are part of Spain.
(b): Cognato A.I., 2000. Phylogenetic reveals new genus of Ipini bark beetle (Scolytidae). Annals of the Entomological Society of America 93:
(362-366.) and the species Ips (=Orthotomicus) orientalis Wood & Yin, 1986 was moved under Pseudips orientalis (Wood & Yin, 1986). The recent catalog of the palaearctic species of Alonso-Zarazaga et al. (2017) adopts this new classification.

Appendix B – Scolytinae species excluded from further categorisation in the frame of the present mandate

The appendix lists the Scolytinae species present in the EU, their geographic occurrence in the EU MS and in non-EU European countries, as well as outside the EU (at continent level), the associated uncertainties or comments, and the main references from which the information was extracted.

IID	Species	List of EU MS where species is present	List of non-EU European countries where pest is present	Presence outside EU (continents)	Comments/Uncertainties	Reference
1.	*Carphoborus cholodkovskyi*	Estonia, Finland, Poland, Sweden	Norway, Russia	Asia		Alonso-Zarazaga et al. (2017)
2.	*Carphoborus minimus*	Austria, Bulgaria, Croatia, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Netherlands, Poland, Romania, Slovakia, Slovenia, Spain	Albania, Belarus, Bosnia-Herzegovina, North Macedonia, Montenegro, Russia, Switzerland, Ukraine	Asia, North Africa		Alonso-Zarazaga et al. (2017)
3.	*Carphoborus pini*	Croatia, Cyprus, France, Greece, Italy, Spain	Bosnia-Herzegovina	Asia, North Africa		Alonso-Zarazaga et al. (2017)
4.	*Carphoborus rossicus*	Austria, Finland, Sweden	Russia		FI NPPO: occurred in Finland before 1960. Endemic EU species SE NPPO: first observed in Sweden already around 1920. Listed as vulnerable on Swedish red-list. Should be on EU list.	Alonso-Zarazaga et al. (2017), de Jong et al. (2014), Hyvärinen et al. (2019), ArtDatabanken (2015), ArtDatabanken SLU (2019a), and Voolma et al. (2004)
5.	*Carphoborus teplouchovi*	Sweden	Russia	China, Mongolia	FI NPPO: the species has not been reported in Finland, though it may occur SE NPPO: first observed in Sweden before 1960. Red-listed in Sweden.	Alonso-Zarazaga et al. (2017), de Jong et al. (2014), ArtDatabanken (2015), ArtDatabanken SLU (2019b) and Voolma et al. (2004)

IID	Species	List of EU MS where species is present	List of non-EU European countries where pest is present	Presence outside EU (continents)	Comments/Uncertainties	Reference
6.	*Cryphalus asperatus*	Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, UK	Belarus, Bosnia-Herzegovina, North Macedonia, Montenegro, Norway, Russia, Switzerland	Asia, North Africa		Alonso-Zarazaga et al. (2017) and Wood and Bright (1992)
7.	*Cryphalus intermedius*	Austria, Czech Republic, France, Germany, Hungary, Italy, Poland, Romania, Slovakia, Slovenia	Switzerland, Ukraine			Alonso-Zarazaga et al. (2017)
8.	*Cryphalus numidicus*	Bulgaria, France, Greece, Italy, Spain	Switzerland	Asia, North Africa		Alonso-Zarazaga et al. (2017)
9.	*Cryphalus piceae*	Austria, Bulgaria, Croatia, Czech Republic, Denmark, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia, Spain	Belarus, Bosnia-Herzegovina, North Macedonia, Montenegro, Russia, Switzerland, Ukraine	Asia, North Africa		Alonso-Zarazaga et al. (2017) and Hansen (1996)
10.	*Cryphalus saltuarius*	Austria, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Italy, Poland, Slovakia, Sweden	Belarus, Montenegro, Norway, Russia, Switzerland	Asia		Alonso-Zarazaga et al. (2017)
11.	*Crypturgus cinereus*	Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Poland, Romania, Slovakia, Slovenia, Spain, Sweden	Belarus, North Macedonia, Montenegro, Norway, Russia, Switzerland, Ukraine	Asia		Alonso-Zarazaga et al. (2017)
12.	*Crypturgus cribrellus*	Bulgaria, Croatia, France, Italy, Portugal, Slovenia, Spain	North Macedonia, Montenegro, Ukraine			Alonso-Zarazaga et al. (2017)

IID	Species	List of EU MS where species is present	List of non-EU European countries where pest is present	Presence outside EU (continents)	Comments/Uncertainties	Reference
13.	*Crypturgus cylindricollis*	Bulgaria, Croatia, Greece, Malta	Bosnia-Herzegovina	Asia		Alonso-Zarazaga et al. (2017)
14.	*Crypturgus hispidulus*	Austria, Bulgaria, Czech Republic, Denmark, Estonia, Finland, Germany, Hungary, Italy, Latvia, Lithuania, Netherlands, Poland, Slovakia, Sweden	Belarus, Norway, Russia, Switzerland	Asia		Alonso-Zarazaga et al. (2017), Vorst et al. (2008) and Vorst (2010)
15.	*Crypturgus mediterraneus*	Croatia, Cyprus, France, Greece, Italy, Portugal	Russia, Ukraine	Asia, North Africa		Alonso-Zarazaga et al. (2017)
16.	*Crypturgus numidicus*	Bulgaria, Croatia, France, Greece, Italy, Malta, Spain	Bosnia-Herzegovina, Montenegro, Russia	Asia, North Africa		Alonso-Zarazaga et al. (2017)
17.	*Crypturgus parallelocollis*	Greece	Turkey			Alonso-Zarazaga et al. (2017) and de Jong et al. (2014)
18.	*Crypturgus pusillus*	Austria, Belgium, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden	Belarus, Bosnia-Herzegovina, North Macedonia, Montenegro, Norway, Russia, Switzerland, Ukraine	North America, Asia, North Africa		Alonso-Zarazaga et al. (2017)
19.	*Crypturgus subcribrosus*	Austria, Czech Republic, Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Netherlands, Poland, Slovakia, Slovenia, Sweden	Belarus, Bosnia-Herzegovina, Norway, Russia, Ukraine	Asia		Alonso-Zarazaga et al. (2017), Vorst (2010) and Heijerman and Noordijk (2016)
20.	*Dendroctonus micans*	Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Slovakia, Slovenia, Spain, Sweden, UK	Belarus, Montenegro, Norway, Russia, Switzerland, Ukraine	Asia		Alonso-Zarazaga et al. (2017)

IID	Species	List of EU MS where species is present	List of non-EU European countries where pest is present	Presence outside EU (continents)	Comments/Uncertainties	Reference
21.	*Dryocoetes autographus*	Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, UK	Belarus, Bosnia-Herzegovina, Moldova, Montenegro, Norway, Russia, Switzerland, Ukraine	North America, South America, Asia, North Africa		Atkinson (2018)
22.	*Dryocoetes hectographus*	Belgium, Bulgaria, Czech Republic, Finland, France, Germany, Hungary, Italy, Latvia, Lithuania, Poland, Slovakia, Slovenia, Sweden	Belarus, Montenegro, Norway, Russia, Switzerland	Asia		Alonso-Zarazaga et al. (2017)
23.	*Gnathotrichus materiarius*	Belgium, Czech Republic, Finland, France, Germany, Italy, Netherlands, Poland, Slovenia, Spain, Sweden	Switzerland	North America, Central America	Introduced into Europe	Atkinson (2018), Geister (2004) and Kirkendall and Faccoli (2010)
24.	*Hylastes angustatus*	Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, UK	Belarus, North Macedonia, Montenegro, Russia, Switzerland, Ukraine	Asia, Sub-Saharan Africa		Alonso-Zarazaga et al. (2017)
25.	*Hylastes ater*	Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Netherlands, Poland, Slovakia, Slovenia, Spain, Sweden, UK	Belarus, Bosnia-Herzegovina, North Macedonia, Montenegro, Russia, Switzerland, Ukraine	South America, Asia, North Africa, Oceania	FI NPPO: the species does not occur in Finland	Atkinson (2018)

IID	Species	List of EU MS where species is present	List of non-EU European countries where pest is present	Presence outside EU (continents)	Comments/Uncertainties	Reference
26.	*Hylastes attenuatus*	Austria, Belgium, Croatia, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, UK	Belarus, Bosnia-Herzegovina, North Macedonia, Norway, Russia, Switzerland, Ukraine	Asia, North Africa		Alonso-Zarazaga et al. (2017), Heijerman and Noordijk, 2017, 2018, 2019 and Vorst (2010)
27.	*Hylastes brunneus*	Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Hungary, Ireland, Italy, Latvia, Netherlands, Poland, Slovakia, Slovenia, Sweden, UK	North Macedonia, Norway, Russia, Switzerland	Asia		Alonso-Zarazaga et al. (2017) and Vorst (2010)
28.	*Hylastes cunicularius*	Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Poland, Portugal, Slovakia, Slovenia, Sweden, UK	Belarus, Bosnia-Herzegovina, North Macedonia, Montenegro, Norway, Russia, Switzerland, Ukraine	Asia, North Africa		Alonso-Zarazaga et al. (2017) and Vorst (2010)
29.	*Hylastes fallax*	Austria, Czech Republic, Italy, Romania, Slovakia				Alonso-Zarazaga et al. (2017)
30.	*Hylastes linearis*	Croatia, Cyprus, Czech Republic, France, Germany, Greece, Hungary, Italy, Netherlands, Poland, Portugal, Slovenia, Spain, UK	North Macedonia, Montenegro, Switzerland	South America, Asia, North Africa, Sub-Saharan Africa		Atkinson (2018) and Vorst (2010)
31.	*Hylastes opacus*	Austria, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Poland, Slovakia, Slovenia, Sweden, UK	Belarus, North Macedonia, Montenegro, Norway, Russia, Switzerland	North America, Asia		Atkinson (2018) and Vorst (2010)

IID	Species	List of EU MS where species is present	List of non-EU European countries where pest is present	Presence outside EU (continents)	Comments/Uncertainties	Reference
32.	*Hylurgops glabratus*	Austria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Poland, Slovakia, Slovenia, Sweden	Belarus, Bosnia-Herzegovina, Norway, Russia, Switzerland	Asia		Alonso-Zarazaga et al. (2017)
33.	*Hylurgops palliatus*	Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Poland, Slovakia, Slovenia, Spain, Sweden, UK	Belarus, North Macedonia, Montenegro, Norway, Russia, Switzerland, Ukraine	North America, Asia, North Africa		Atkinson (2018)
34.	*Hylurgus ligniperda*	Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Italy, Latvia, Lithuania, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden	Bosnia-Herzegovina, North Macedonia, Moldova, Montenegro, Russia, Serbia, Switzerland, Ukraine	North America, South America, Asia, North Africa, Sub-Saharan Africa, Oceania		Atkinson (2018)
35.	*Hylurgus micklitzi*	Croatia, France, Germany, Greece, Hungary, Italy, Malta, Spain	Russia	Asia, North Africa		Alonso-Zarazaga et al. (2017)
36.	*Hypothenemus eruditus*	Croatia, France, Italy, Malta, Spain		North America, Central America, South America, Asia, North Africa, Sub-Saharan Africa, Oceania		Atkinson (2018)

IID	Species	List of EU MS where species is present	List of non-EU European countries where pest is present	Presence outside EU (continents)	Comments/Uncertainties	Reference
37.	*Ips acuminatus*	Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, UK	Belarus, Bosnia-Herzegovina, North Macedonia, Moldova, Montenegro, Norway, Russia, Switzerland, Ukraine	Asia	NL NPPO: the reported presence of I. *acuminatus* in NL is questionable. All historical findings are associated with wood imports and it is, thus, questionable whether a viable population has established (Heijerman, 2010).	Alonso-Zarazaga et al. (2017)
38.	*Ips amitinus*	Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia, Sweden	Bosnia-Herzegovina, North Macedonia, Montenegro, Russia, Switzerland, Ukraine	Asia	NL NPPO: No valid records of the species exist in the Netherlands	Alonso-Zarazaga et al. (2017) and Jurc and Bojović (2004)
39.	*Ips cembrae*	Austria, Belgium, Czech Republic, Denmark, France, Germany, Greece, Hungary, Italy, Netherlands, Poland, Slovakia, Slovenia, Sweden, UK	Russia, Switzerland	Asia		Alonso-Zarazaga et al. (2017) and ArtDatabanken SLU (2019e)
40.	*Ips duplicatus*	Austria, Czech Republic, Estonia, Finland, France, Germany, Hungary, Latvia, Lithuania, Poland, Slovakia, Sweden	Belarus, Norway, Russia	Asia		Alonso-Zarazaga et al. (2017)
41.	*Ips sexdentatus*	Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, UK	Belarus, Bosnia-Herzegovina, North Macedonia, Moldova, Montenegro, Norway, Russia, Switzerland, Ukraine	Asia		Alonso-Zarazaga et al. (2017)

IID	Species	List of EU MS where species is present	List of non-EU European countries where pest is present	Presence outside EU (continents)	Comments/Uncertainties	Reference
42.	*Ips typographus*	Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, UK	Belarus, Bosnia-Herzegovina, Moldova, Montenegro, Norway, Russia, Switzerland, Ukraine	Asia, North Africa		Alonso-Zarazaga et al. (2017), Vorst et al. (2008), Vorst (2010) and Heijerman and Noordijk (2017, 2019)
43.	*Orthotomicus erosus*	Austria, Bulgaria, Croatia, Cyprus, France, Greece, Hungary, Italy, Malta, Netherlands, Portugal, Slovenia, Spain, UK	North Macedonia, Montenegro, Norway, Russia, Switzerland, Ukraine	North America, South America, Asia, North Africa, Sub-Saharan Africa	CY NPPO: The species is present in Cyprus	Atkinson (2018), Vorst et al. (2008) and Vorst (2010)
44.	*Orthotomicus laricis*	Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, UK	Belarus, Bosnia-Herzegovina, North Macedonia, Moldova, Montenegro, Norway, Russia, Switzerland, Ukraine	South America, Asia, North Africa		Atkinson (2018)
45.	*Orthotomicus longicollis*	Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Poland, Slovakia, Slovenia, Spain, Sweden	Belarus, Bosnia-Herzegovina, North Macedonia, Norway, Russia, Serbia, Switzerland, Ukraine	Asia		Alonso-Zarazaga et al. (2017)
46.	*Orthotomicus mannsfeldi*	Austria, Bulgaria, Croatia, France, Greece, Hungary, Italy, Poland, Romania, Spain	Bosnia-Herzegovina, North Macedonia, Montenegro	Asia		Alonso-Zarazaga et al. (2017)

IID	Species	List of EU MS where species is present	List of non-EU European countries where pest is present	Presence outside EU (continents)	Comments/Uncertainties	Reference
47.	*Orthotomicus proximus*	Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden	Belarus, Bosnia-Herzegovina, Moldova, Montenegro, Norway, Russia, Serbia, Switzerland, Ukraine	Asia, North Africa, Sub-Saharan Africa		Alonso-Zarazaga et al. (2017) and Artsdatabanken (2019)
48.	*Orthotomicus robustus*	Austria, Bulgaria, Czech Republic, Greece, Hungary, Slovakia	Bosnia-Herzegovina	Asia, North Africa		Alonso-Zarazaga et al. (2017)
49.	*Orthotomicus starki*	Lithuania, Poland	Belarus, Russia		FI NPPO: the species does not occur in Finland. The species was found in Poland before 1960 and Karpinski (1931) described it from Poland	Alonso-Zarazaga et al. (2017) and de Jong et al. (2014)
50.	*Orthotomicus suturalis*	Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, UK	Belarus, Bosnia-Herzegovina, North Macedonia, Moldova, Montenegro, Norway, Russia, Serbia, Switzerland, Ukraine			Alonso-Zarazaga et al. (2017)
51.	*Phloeosinus aubei*	Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, France, Greece, Hungary, Italy, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, UK	Albania, Bosnia-Herzegovina, North Macedonia, Montenegro, Russia, Switzerland, Ukraine	Asia, North Africa	SI NPPO: The presence of the species was confirmed based on the entomological collection of the Biotechnical Faculty, Department of Forestry and Renewable Forest Resources	Alonso-Zarazaga et al. (2017), Moraal (2005) and Vorst (2010)
52.	*Phloeosinus henschi*	Bulgaria, Croatia, Greece, Slovenia, Italy	Bosnia and Herzegovina, North Macedonia, Ukraine	Asia	The species is associated with pathogenic fungi (*Geosmithia* spp.)	Alonso-Zarazaga et al. (2017), de Jong et al. (2014) and Kolařík et al. (2007)

IID	Species	List of EU MS where species is present	List of non-EU European countries where pest is present	Presence outside EU (continents)	Comments/Uncertainties	Reference
53.	*Phloeosinus laricionis*	Italy				Alonso-Zarazaga et al. (2017)
54.	*Phloeosinus pfefferi*	Cyprus				Alonso-Zarazaga et al. (2017)
55.	*Phloeosinus rudis*	France, Netherlands, Italy, Belgium		Asia		Alonso-Zarazaga et al. (2017), de Jong et al. (2014) and Moucheron et al. (2019)
56.	*Phloeosinus thujae*	Austria, Belgium, Bulgaria, Croatia, France, Germany, Greece, Hungary, Italy, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, UK	Albania, Bosnia-Herzegovina, North Macedonia, Montenegro, Russia, Switzerland, Ukraine	Asia, North Africa		Alonso-Zarazaga et al. (2017), Lindelöw (2013) and ArtDatabanken SLU (2019f)
57.	*Phloeotribus spinulosus*	Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Italy, Latvia, Netherlands, Poland, Romania, Slovakia, Spain, Sweden	Belarus, Norway, Russia, Switzerland, Ukraine	Asia		Alonso-Zarazaga et al. (2017)
58.	*Pityogenes bidentatus*	Austria, Belgium, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, UK	Belarus, Bosnia-Herzegovina, North Macedonia, Moldova, Montenegro, Norway, Russia, Switzerland, Ukraine	North America, Asia, Sub-Saharan Africa		Atkinson (2018)
59.	*Pityogenes bistridentatus*	Austria, Bulgaria, Croatia, Cyprus, Czech Republic, France, Germany, Greece, Hungary, Italy, Poland, Romania, Slovakia, Slovenia, Spain	Albania, Bosnia-Herzegovina, North Macedonia, Montenegro, Russia, Switzerland, Ukraine	Asia		Alonso-Zarazaga et al. (2017)

IID	Species	List of EU MS where species is present	List of non-EU European countries where pest is present	Presence outside EU (continents)	Comments/Uncertainties	Reference
60.	*Pityogenes calcaratus*	Croatia, France, Greece, Italy, Malta, Portugal, Slovenia, Spain	Russia, Ukraine	Asia, North Africa	SI NPPO: The species was confirmed as present based on the entomological collection of the Biotechnical Faculty, Department of Forestry and Renewable Forest Resources	Alonso-Zarazaga et al. (2017)
61.	*Pityogenes chalcographus*	Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Poland, Slovakia, Slovenia, Spain, Sweden, UK	Belarus, Bosnia-Herzegovina, North Macedonia, Moldova, Montenegro, Norway, Russia, Switzerland	Asia		Alonso-Zarazaga et al. (2017), Vorst et al. (2008), Vorst (2010) and Heijerman and Noordijk (2018, 2019)
62.	*Pityogenes conjunctus*	Austria, Bulgaria, Czech Republic, France, Germany, Hungary, Italy, Romania, Slovakia, Slovenia	Switzerland, Ukraine	Asia		Alonso-Zarazaga et al. (2017)
63.	*Pityogenes irkutensis irkutensis*	Finland, Sweden	Norway, Russia, Turkey	Asia	FI NPPO: occurred in Finland before 1960. Vulnerable in Finland according to the Finnish red-list. SE NPPO: established in Sweden with old records e.g. from 1937. Red-listed in Sweden. Should be on the EU list.	Alonso-Zarazaga et al. (2017), de Jong et al. (2014), Hyvärinen et al. (2019), ArtDatabanken (2015), ArtDatabanken SLU (2019c,g), and Voolma et al. (2004)
64.	*Pityogenes irkutensis monacensis*	Austria, Bulgaria, Czech Republic, Germany, Lithuania, Poland, Romania	Montenegro, Serbia, Switzerland, Ukraine			Alonso-Zarazaga et al. (2017)
65.	*Pityogenes porifrons*	Cyprus, Greece				Alonso-Zarazaga et al. (2017)

IID	Species	List of EU MS where species is present	List of non-EU European countries where pest is present	Presence outside EU (continents)	Comments/Uncertainties	Reference
66.	*Pityogenes quadridens*	Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Poland, Slovakia, Slovenia, Spain, Sweden, UK	Belarus, Bosnia-Herzegovina, North Macedonia, Moldova, Montenegro, Norway, Russia, Switzerland, Ukraine	Asia		Alonso-Zarazaga et al. (2017)
67.	*Pityogenes saalasi*	Finland, Poland, Sweden	Norway, Russia	Asia	FI NPPO: occurred in Finland before 1960. SE NPPO: established in Sweden with old records e.g. from 1944. Should be on the EU list.	Alonso-Zarazaga et al. (2017), de Jong et al. (2014), Hyvärinen et al. (2019), ArtDatabanken SLU (2019d), and Voolma et al. (2004)
68.	*Pityogenes trepanatus*	Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Italy, Latvia, Netherlands, Poland, Portugal, Romania, Slovenia, Spain, Sweden, UK	Belarus, Bosnia-Herzegovina, Montenegro, Norway, Russia, Switzerland, Ukraine		SI NPPO: The presence of the species was confirmed based on the entomological collection of the Biotechnical Faculty, Department of Forestry and Renewable Forest Resources	Alonso-Zarazaga et al. (2017), Vorst et al. (2008), Vorst (2010) and Heijerman and Noordijk (2016)
69.	*Pityokteines curvidens*	Austria, Belgium, Bulgaria, Croatia, Czech Republic, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Poland, Portugal, Romania, Slovenia, Spain	Belarus, Bosnia-Herzegovina, North Macedonia, Montenegro, Russia, Serbia, Switzerland, Ukraine	South America, Asia, Sub-Saharan Africa		Atkinson (2018)
70.	*Pityokteines spinidens*	Austria, Belgium Bulgaria, Croatia, Czech Republic, France, Germany, Greece, Italy, Netherlands, Poland, Romania, Slovakia, Slovenia, Spain	Bosnia-Herzegovina, Montenegro, Russia, Serbia, Switzerland	Asia	BE NPPO: the species is present in Belgium. SI NPPO: the species is present in Slovenia	Alonso-Zarazaga et al. (2017) and Heijerman and Noordijk (2017)

IID	Species	List of EU MS where species is present	List of non-EU European countries where pest is present	Presence outside EU (continents)	Comments/Uncertainties	Reference
71.	*Pityokteines vorontzowi*	Austria, Belgium, Bulgaria, Croatia, Czech Republic, France, Germany, Greece, Hungary, Italy, Poland, Romania, Slovakia, Slovenia, Spain	Bosnia-Herzegovina, North Macedonia, Montenegro, Russia, Switzerland, Ukraine	Asia		Alonso-Zarazaga et al. (2017) and Moucheron et al. (2018)
72.	*Pityophthorus balcanicus*	Bulgaria, Czech Republic, Romania, Slovakia, Slovenia	Albania, Bosnia-Herzegovina, North Macedonia, Montenegro, Serbia			Alonso-Zarazaga et al. (2017) and Titovšek (1983)
73.	*Pityophthorus buyssoni angeri*	France (Mainland and Corsica)			FR NPPO: endemic species in Corsica.	Alonso-Zarazaga et al. (2017) and de Jong et al. (2014)
74.	*Pityophthorus buyssoni buyssoni*	Bulgaria, France, Greece, Italy, Spain	Switzerland		FR NPPO: the species is widespread in France and Europe	Alonso-Zarazaga et al. (2017)
75.	*Pityophthorus carniolicus*	Austria, Croatia, Czech Republic, France, Germany, Hungary, Italy, Poland, Slovakia, Slovenia				Alonso-Zarazaga et al. (2017)
76.	*Pityophthorus cephalonicae*	Greece, Poland				Alonso-Zarazaga et al. (2017)
77.	*Pityophthorus exsculptus*	Austria, Bulgaria, Czech Republic, France, Germany, Hungary, Italy, Poland, Slovakia	Bosnia-Herzegovina, Switzerland			Alonso-Zarazaga et al. (2017)
78.	*Pityophthorus glabratus*	Austria, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Italy, Lithuania, Luxembourg, Netherlands, Poland, Slovakia, Spain, Sweden	Belarus, Montenegro, Norway, Russia, Serbia, Switzerland, Ukraine	Asia, North Africa		Alonso-Zarazaga et al. (2017) and Vorst (2010)
79.	*Pityophthorus henscheli*	Austria, Bulgaria, France, Germany, Greece, Italy, Romania	Bosnia, Montenegro, Switzerland, Ukraine			Alonso-Zarazaga et al. (2017)

IID	Species	List of EU MS where species is present	List of non-EU European countries where pest is present	Presence outside EU (continents)	Comments/Uncertainties	Reference
80.	*Pityophthorus lichtensteinii*	Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Slovakia, Slovenia, Spain, Sweden, UK	Bosnia-Herzegovina, North Macedonia, Montenegro, Norway, Russia, Switzerland, Ukraine	Asia		Alonso-Zarazaga et al. (2017)
81.	*Pityophthorus micrographus micrographus*	Austria, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Poland, Romania, Spain, Sweden, UK	Belarus, Montenegro, Norway, Russia, Serbia, Switzerland	Asia		Alonso-Zarazaga et al. (2017)
82.	*Pityophthorus morosovi*	Austria, Czech Republic, Finland, Latvia, Poland, Sweden	Russia	Asia		Alonso-Zarazaga et al. (2017)
83.	*Pityophthorus pinsapo*	Spain				Alonso-Zarazaga et al. (2017)
84.	*Pityophthorus pityographus pityographus*	Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, France, Germany, Greece, Hungary, Italy, Poland, Romania, Slovakia, Slovenia, Spain, Sweden	Bosnia-Herzegovina, North Macedonia, Montenegro, Switzerland, Ukraine			Alonso-Zarazaga et al. (2017) and Ericson (2010)
85.	*Pityophthorus pubescens*	Austria, Belgium, Croatia, Cyprus, Czech Republic, Denmark, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Poland, Slovakia, Slovenia, Spain, Sweden, UK	Norway, Switzerland	Asia, North Africa		Alonso-Zarazaga et al. (2017)
86.	*Pityophthorus traegardhi*	Austria, Estonia, Finland, Poland, Sweden	Norway, Russia	Asia		Alonso-Zarazaga et al. (2017)

IID	Species	List of EU MS where species is present	List of non-EU European countries where pest is present	Presence outside EU (continents)	Comments/Uncertainties	Reference
87.	*Polygraphus grandiclava*	Austria, Belgium, Bulgaria, Croatia, Czech Republic, France, Germany, Hungary, Italy, Netherlands, Poland, Romania, Slovakia, Slovenia	Bosnia-Herzegovina, Moldova, Montenegro, Russia, Serbia, Switzerland, Ukraine			Alonso-Zarazaga et al. (2017), Heijerman and Noordijk (2019), Vorst et al. (2008) and Vorst (2010)
88.	*Polygraphus poligraphus*	Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, UK	Belarus, Bosnia-Herzegovina, Moldova, Montenegro, Norway, Russia, Switzerland, Ukraine	Asia, Sub-Saharan Africa		Alonso-Zarazaga et al. (2017), Vorst (2010), Titovšek (1988) and Martikainen et al. (1999)
89.	*Polygraphus punctifrons*	Czech Republic, Estonia, Finland, Latvia, Poland, Slovakia, Sweden	Norway, Russia, Ukraine	Asia		Alonso-Zarazaga et al. (2017)
90.	*Polygraphus subopacus*	Austria, Bulgaria, Czech Republic, Estonia, Finland, France, Germany, Hungary, Latvia, Poland, Slovakia, Sweden	Montenegro, Norway, Russia, Switzerland	Asia		Alonso-Zarazaga et al. (2017)
91.	*Tomicus destruens*	Croatia, Cyprus, France, Greece, Italy, Portugal, Slovenia, Spain	Russia, Ukraine	Asia, North Africa		Alonso-Zarazaga et al. (2017)
92.	*Tomicus minor*	Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, UK	Belarus, Bosnia-Herzegovina, North Macedonia, Montenegro, Norway, Russia, Switzerland, Ukraine	Asia		Alonso-Zarazaga et al. (2017)

IID	Species	List of EU MS where species is present	List of non-EU European countries where pest is present	Presence outside EU (continents)	Comments/Uncertainties	Reference
93.	*Tomicus piniperda*	Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, UK	Belarus, Bosnia-Herzegovina, North Macedonia, Montenegro, Norway, Russia, Switzerland, Ukraine	North America, Asia, North Africa		Atkinson (2018)
94.	*Trypodendron laeve*	Austria, Czech Republic, Estonia, Finland, Germany, Latvia, Poland, Romania, Slovakia, Sweden	Norway, Russia, Switzerland	Asia		Alonso-Zarazaga et al. (2017)
95.	*Trypodendron lineatum*	Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, UK	Belarus, Bosnia-Herzegovina, North Macedonia, Montenegro, Norway, Russia, Switzerland	North America, Asia, North Africa		Atkinson (2018)
96.	*Xyleborinus saxesenii*	Austria, Belgium, Bulgaria, Croatia, Denmark, Czech Republic, France, Germany, Greece, Hungary, Italy, Netherlands, Poland, Slovenia, Spain, Sweden, UK	Albania, Russia, Ukraine	North America, South America, Asia, North Africa, Sub-Saharan Africa, Oceania		Atkinson (2018), Heijerman and Noordijk (2016, 2017, 2018, 2019), Vorst et al. (2008), Vorst (2010) and Wood and Bright (1992)
97.	*Xyleborus eurygraphus*	Austria, Croatia, Czech Republic, France, Germany, Greece, Hungary, Italy, Luxembourg, Netherlands, Poland, Portugal, Slovakia, Spain	Bosnia-Herzegovina, North Macedonia, Moldova, Montenegro, Russia, Serbia, Switzerland, Ukraine	Asia, North Africa	NL NPPO: the presence of *X. eurygraphus* in the NL is questionable. All historical findings are associated with wood imports and it is, thus, questionable whether a viable population has established (Heijerman, 2010).	Alonso-Zarazaga et al. (2017)

IID	Species	List of EU MS where species is present	List of non-EU European countries where pest is present	Presence outside EU (continents)	Comments/Uncertainties	Reference
98.	*Xylechinus pilosus*	Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, UK	Montenegro, Norway, Russia, Ukraine	Asia		Alonso-Zarazaga et al. (2017)
99.	*Xylosandrus germanus*	Austria, Belgium, Croatia, Czech Republic, Denmark, France, Germany, Hungary, Italy, Netherlands, Poland, Romania, Slovenia, Spain, UK	Russia, Switzerland, Ukraine	North America, Asia	Introduced into Europe	Atkinson (2018), Jurc et al. (2010) and Björklund and Boberg (2017)

Annex A – Full list non-EU Scolytinae

The annex contains detailed information on occurrence and the hosts of different non-EU Scolytinae species.

Annex B – Short list non EU Scolytinae

The annex contains detailed information of those non-EU Scolytinae species for which information on their biology and impact was available.