

CHECKLIST OF INSECT AND MITE SPECIES ATTACKING CONES AND SEEDS OF WORLD CONIFERS

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ABSTRACT

Listed alphabetically by order, family, genus, and species are 360 insect and mite species that attack flowers, cones, and seeds of world conifers. Synonyms, misspellings, invalid combinations, erroneous author names, and abbreviations of author names are listed exactly as published following the currently accepted species binomen. All species names listed are referenced to the cone and seed insect literature where that terminology appears.

Key Words: Cone and seed insects and mites, world checklist, Coleoptera, Diptera, Heteroptera, Homoptera, Hymenoptera, Lepidoptera, Thysanoptera, Acari.

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INTRODUCTION

Insects and mites that attack and destroy the cones and seeds of conifers throughout the world have received increased attention in recent years. This interest parallels the growing emphasis on production of large quantities of viable seed for use in tree regeneration programs. The emphasis on production and protection of large quantities of genetically improved seed in seed orchards also has heightened this interest.

In 1983, the Cone and Seed Insects Working Party (S2.07-01) of the International Union of Forestry Research Organisations (IUFRO) solicited workers throughout the world to develop a list of all insect and mite species that attack, damage, or kill the flowers, cones, or seeds of conifers. Simultaneously, the literature was reviewed and a master list of all species was produced. These lists were to form a basis for developing a publication on the world cone and seed insects and mites of conifers similar to those produced for North America [23] and France [48].

It became apparent that these lists were in need of considerable taxonomic editing in order to develop a master list that reflects the current state of taxonomic nomenclature. With the assistance of taxonomists from the Insect Identification and Beneficial Insect Introduction Institute of the USDA in Washington, D.C., the University of Minnesota, and North Carolina State University, a revised list reflecting the current taxonomy of the groups was developed and all species from the original lists were incorporated under this revised scheme. This included synonyms, invalid combinations, misspellings, erroneous authorships, and various abbreviations for authors' names. In some cases these author abbreviations created major problems in determining the species being referenced. To assist the nontaxonomist I include, exactly as they appear in print, all such abbreviations in the list below each species. With the exception of "L." for Linnaeus and "F." for

Fabricius, all author names are spelled out in the main entries. Species within the class Insecta are listed first, followed by species within the class Arachnida. Within each class the orders, families, and species names are listed alphabetically. The sources of inclusions in this checklist are in brackets [] by reference number; those not referenced are from personal correspondence.

No attempt was made to include all the world cone and seed insect references, but rather I tried to include the important monographs on the subject or other significant references that represent major listings or additions to insect and mite species attacking conifer cones and seeds.

CLASS INSECTA

COLEOPTERA

Anobiidae

- Ernobius abietinus* (Gyllenhal)
- E. abietinus* Gyll. [48,83]
- Ernobius abietis* (F.)
- E. abietis* F. [10,11,48,73]
- E. abietis* L. [74,77]
- E. abietis* Fabr. [83]
- Anobium abietes* Fb. [6]
- Ernobius alutaceus* (LeConte) [27]
- Ernobius anatolicus* Johnson
- E. anatolicus* Johns. [48]
- Ernobius angusticollis* (Ratzeburg)
- E. angusticollis* Ratzebg. [10,11]
- E. angusticollis* Ratz. [48]
- E. parvicollis* Muls. [48]
- E. tabidus* Kiesw. [48]
- E. tabidus* Kzw. [65,74]
- E. tabidus* Ksw. [72,73,77]
- Ernobius bicolor* White [82]
- Ernobius conicola* Fisher [23]
- E. cupressi* VanDyke [26]
- E. cupressi* Van Dyke [23]
- Ernobius cupressi* Chobaut
- E. cupressi* Chob. [48]
- Ernobius fructuum* Peyerimhoff
- E. fructuum* Peyer [48]
- Ernobius granulatus* LeConte [23]
- E. granulatus* Lec. [39]
- Ernobius kailidisi* Johnson [31]
- Ernobius longicornis* (Sturm)
- E. longicornis* Sturm. [48]
- E. densicornis* Muls. and Rey [48]
- Ernobius melanoventris* Ruckes [23]

Ernobius mollis (L.)*E. mollis* Linné [88]*E. mollis* L. [38,48]*E. mollis* LeConte [23]*E. mollis* F. [48]*Ernobius montanus* Fall [23,26]*Ernobius nigrans* Fall [23,54]*Ernobius oertzeni* Schilsky*E. oertzenii* Schils. [48]*Ernobius oxycedri* Reitter*E. oxycedri* Reitt. [48]*Ernobius pallitarsis* Fall [23,26]*Ernobius parens* (Mulsant and Rey)*E. parens* Muls. [48]*Ernobius pini* (Sturm)*E. pini* Sturm. [48,50]*Ernobius pini* var. *crassiusculus* Mulsant and Rey*E. pini* var. *crassiusculus* Muls. [11,48]*E. pini* Strm. var. *crassiusculus* Muls. [10]*Ernobius pinicola* Ruckes [23]*Ernobius punctulatus* (LeConte) [21,23]*E. punctulatus* Leconte [48,53]*E. punctulatus* (Lec.) [26]

Apionidae

Nanodiscus transversus (Aubé)*N. transversus* Aubé [48,51]

Buprestidae

Chrysobothris cupressicona Barr and Wescott [23]

Curculionidae

Anthonomus varians (Paykull)*A. varians* Payk. [76]*Conotrachelus neomexicanus* Fall [23]*Pissodes validirostris* Gyllenhal*P. validirostris* Gyll. [5,10,11,12,20,46,47,48,50,65,73,83,88]

Meloidae

Lytta polita Say [23]*Pomphopea polita* (Say) [39]

Nemonychidae

Neocimberis elongatus (LeConte)*Cimberis elongatus* (LeConte) [23]*Neocimberis pilosus* (LeConte)*Cimberis pilosus* (LeConte) [23]

Ptinidae

Ptinus fur (L.)*P. fur* L. [38,48]*P. fur* [37]

Scarabaeidae

Dichelonyx backi (Kirby)*D. backi* Kirby [23]*Phyllophaga micans* (Knoch) [15,16,23]

Scolytidae

Conophthorus apacheae Hopkins [23,86]*C. apacheae* Hopk. [26]*Conophthorus cembroides* Wood [23,86]*Conophthorus conicolens* Wood [23,86]*Conophthorus coniperda* (Schwarz) [15,16,23,84,86]*C. clunicus* Hopkins [23,86]*C. taedae* Hopkins [23,86]*Conophthorus echinatae* Wood [23,86]*Conophthorus edulis* Hopkins [23,86]*C. edulis* Hopk. [26]*Conophthorus mexicanus* Wood [23,86]*Conophthorus michoacanae* Wood [86]*Conophthorus michoacanae* Wood [85]*Conophthorus monophyllae* Hopkins [23,86]*C. monophyllae* Hopk. [26]*Conophthorus ponderosae* Hopkins [23,27,86]*C. ponderosae* Hopk. [26]*C. contortae* Hopkins [23,86]*C. contortae* Hopk. [26]*C. flexilis* Hopkins [23,86]*C. flexilis* Hopk. [26]*C. lambertianae* Hopkins [23,86]*C. lambertianae* Hopk. [26]*C. monticolae* Hopkins [21,23,86]*C. monticolae* Hopk. [26]*C. scopulorum* Hopkins [23,86]*C. scopulorum* Hopk. [26]*Conophthorus radiatae* Hopkins [23,86]*C. radiatae* Hopk. [26]*Conophthorus resinosae* Hopkins [23,86]*C. resinosae* Hopk. [43,84]*C. resinosa* Hopk. [44]*C. virginianae* Hopkins [23,86]*Conophthorus teocotum* Wood [85,86]*Pityophthorus aztecus* Bright [23]*Pityophthorus orarius* Bright [21,53]*Pityophthorus pubescens* (Marshall)*Pityophthorus pubescens* Marsh. [50]

Pityophthorus pulicarius (Zimmermann) [23]

P. pulicarius (Zimm.) [14,69]

P. pulicarius Zimm. [39]

P. pulicarius Zinn. [39]

Pityophthorus schwerdtfergeri (Schedl)

DIPTERA

Anthomyiidae

Lasiomma abietis (Huckett)¹ [23]

L. abietis Huckett [78]

L. abietis Huck. [48,60,73]

L. abietum Huck. [48]

Hylemya abietis Huckett [23]

H. (Lasiomma) abietis Huckett [23]

H. (Pegohylemyia) abietis Huckett [26]

Hylemiaia abietis Huck. [42]

Lasiomma anthracinum (Czerny) [18]

L. anthracina (Czerny) [23,78]

L. anthracina Czerny [48,72]

L. anthracina Czerny [73]

L. anthracinum Czerny [42]

L. anthracium (Gerny) [88]

Hylemya anthracina (Czerny) [23,54]

H. anthracina Czerny [21]

H. (Lasiomma) anthracina (Czerny) [23]

H. (Pegohylemyia) anthracina (Czerny) [26]

Pegohylemyia anthracina Czerny [42,65,74,83]

P. anthracina Czerny [77]

P. anthracini (Czerny) [7]

Pegohylemia anthracina Czerny [84]

Hylemyia anthracina Czerny [61]

Lasiomma baicalense Elberg [18,42,75,88]

L. baicalensis Elberg [48,49]

Lasiomma carbonarium (Ringdahl)

Hylemya (Lasiomma) carbonarium (Ringdahl) [23]

Lasiomma infrequens Ackland [18,42,75]

L. infrequens Ackl. [48,49]

L. infrequens Ackland [88]

Lasiomma jurtschenkoi Elberg [48,49,73]

L. jurtschenkovi Elberg [75]

Lasiomma laricicola (Karl)² [18,88]

L. laricicola Karl [42,48,49,65,73,75]

Hylemyia laricicola Karl [42,74,77,83]

¹ Records of *L. abietis* from Europe probably refer to a different species. Personal communication, F. C. Thompson, ARS Systematic Entomology Laboratory, USDA, Washington, DC.

² North American *Larix* feeding species now called *L. laricicola* (Karl) is a new species. Personal communication, F. C. Thompson, ARS Systematic Entomology Laboratory, USDA, Washington, DC.

- H. laricicola* (Karl) [30,57,59]
Hylemya laricicola (Karl) [28]
H. (Lasiomma) laricicola (Karl) [23]
Chortophila laricicola Karl [42,49,59,90]
Phorbia laricicola (Karl) [63]
Lasiomma luteoforceps Fan et Fang [18]
Lasiomma melania Ackland [42,71,72,73]
L. melania Ackl. [48,49]
L. melania Acland [75]
Lasiomma melania melaniola Fan [18,88]
Lasiomma oriens Suwa³
Lasiomma todocola Suwa³

Cecidomyiidae

- Asynapta hopkinsi* Felt [23,78]
A. hopkinsi (Felt) [43,44]
A. keeni (Foote) [17,23,27]
A. keeni Foote [39]
Rubsaamenia keeni Foote [23,26,78]
Ruebsaamenia keeni Foote [78]
Asynapta laricis Skrzypczynska [64]
A. laricis Skrzypcz. [59]
A. laricis Skrz. [48]
Asynapta strobilophila (Foote) [23]
Holoneurus strobilophilus Foote [26,78]
Camptomyia pinicola Mamaev
C. pinicolana Mam. [48,50]
Camptomyia pseudotsugae Hedlin and Johnson [21,23]
Cecidomyia bisetosa Gagné [16,23]
Cecidomyia pini DeGeer
C. pini Deg. [48]
C. pini (DeGeer) [63]
Contarinia oregonensis Foote [21,23,26,48,53,78]
Contarinia washingtonensis Johnson [21,23,53,78]
Dasineura abiesemia Foote [21,23,78]
Dasineura abiesemia Foote [26]
Dasineura canadensis Felt [21,23,54,78]
Dasineura canadensis Felt [26]
Dasineura laricis (F. Loew) [64]
Dasineura laricis [48]
Dasineura rachiphaga Trip [21,23,54,78]
Dasineura rachiphaga Tripp [26]
Janetiella siskiyou Felt [13,26,48,78]
Craneiobia lawsonianae DeMeijere [13]
Kaltenbachiola strobis (Winnertz) [64,83]
K. strobis (Winn.) [7,61]
K. strobis Winn. [46,48,65,72,73,77]

³ Personal communication, Verner Michelson, Zoologisk Museum, Kobenhavn, Denmark.

- Cecidomyia strobis* Winnertz [7]
Kaltenbachiella strobis (Winnertz) [6]
K. strobis (Winn.) [6]
Kalt. strobis (Winn.) [6]
Kaltenbrachiola strobis Winn. [74]
Kaltenbachiola strobis Winn. [77]
Kaltembakiola strobis Winn. [38]
Mayetiola carpophaga (Tripp) [21,23,54,78]
Phytophaga carpophaga Tripp [26]
Mayetiola thujae (Hedlin) [23,78]
Phytophaga thujae Hedlin [21,23]
Mycodiplosis pucciniae Kieffer [77]
Mycodiplosis thoracica (Fitch) [17,23]
Plemeliella abietina Seitner [64,73,74,77]
P. abietina Seitn. [6,7,48,61,72,83]
P. abietina Stein [48]
Resseliella ingrica (Mamaev)
Thomasiniana ingrica Mam. [74]
T. ingrica Mamajev [61,72,73]
Thomasinianna ingrica Mam. [48]
Resseliella piceae Seitner [38,64,73]
R. piceae [37]
R. piceae Seit. [60]
R. piceae Seitn. [62]
Reseliella piceae Seitn. [48]
Resseliella sibirica (Mamaev)
Thomasiniana sibirica Mamaev [75]
T. sibirica Mamajev [71,73]
Thomasinianna sibirica Mam. [48]
Camptomyia laricis Mam. [48]
C. laricis M. [73]
C. laricis Mar. [65]
Resseliella silvana (Felt) [17,23,43,44]
Mycodiplosis silvana Felt [78]
Resseliella skuhravyorum Skrzypczynska [64]
R. skuhravyorum Skrzyp. [75]
R. skuhravyorum Skrzypcz. [30,57,59,63]
Reseliella skuhravyorum Skrz. [48]
Sequoiomyia taxodii (Felt) [23]
Retinodiplosis taxodii Felt [23,78]
Taxodiomyia cupressi (Schweinitz) [23]⁴

Chloropidae

- Hapleginella conicola* (Greene) [23,27,78]
Oscinella conicola Greene [23]
O. conicola (Greene) [26,39]
Madiza conicola Greene [26]

⁴ This is a gall forming species that was incorrectly cited. Personal communication, R. J. Gagné, ARS Systematic Entomology Laboratory, USDA, Washington, DC.

Hapleginella laevifrons (Loew)⁵ [63]

H. laevifrons Lw. [20,48,50,75]

H. laevifrons Loew [10,11,30]

H. loevifrons Lw. [48]

Haploginella laevifrons Lw. [77]

Oscinus laevifrons Loew [78]

Lonchaeidae

Earomyia abietum McAlpine [21,23,26,32,78]

Earomyia aquilonia McAlpine [21,23,26,32,78]

Earomyia barbara McAlpine [21,23,26,32,53,78]

Earomyia bazini (Seguy) [30,57,59,63]

Earomyia brevistylata McAlpine [23,26,32,78]

Earomyia grusia Morge [60,73]

E. grusia [48]

E. gruzia Morge [38]

E. gruzia [37]

Loncheae fugax Beck [73]

Earomyia impossibile Morge [38,60,62]

E. impossibile [37]

E. impossibilis Morge [48,73]

Earomyia lonchaeoides Zetterstedt

E. lonchaeoides Zett. [76]

Earomyia longistylata McAlpine [23,26,32,78]

Earomyia schistopyga Collin [61,73,75]

E. schistopyga Coelin [71]

Earomyia viridana (Meigen)⁶ [60,63,78]

E. viridana (Meig.) [57]

Spermatolonchea viridana Meig. [48]

Lonchaea polita Say [23,78]

Trypetidae

Rhagoletis flavigenualis Hering [10,11,48]

HETEROPTERA

Acanthosomatidae

Cyphostethus tristriatus (F.)

C. tristriatus F. [48]

Coreidae

Gonocerus juniperi (Herrich-Schäffer)

G. juniperi H. Sch. [48]

Leptoglossus corculus (Say) [15,16,23,44]

L. corculus Say [48]

⁵ Two references indicate direct cone feeding [10,11] while remainder list it as a secondary insect found in dead or dying cones.

⁶ At least one reference lists this as an insect predator [48].

Leptoglossus occidentalis Heidemann [21,23,53,54]

L. occidentalis Heid. [48]

Palomena prasina (L.)

P. prasina L. [65]

Lygaeidae

Eremocoris ferus (Say) [79]

Eremocoris borealis (Dallas) [79]

Gastrodes abietum Bergroth [48]

G. abietum Bergr. [48]

G. abietis Bergr. [48,77]

G. abietis Linn. [4]

G. abietis Deg. [65]

G. abietis L. [83]

Gastrodes grossipes DeGeer [48,77]

G. grossipes deGeer [48]

G. ferrugineus L. [48,83]

G. ferrugineus Linn. [4]

Orsillus depressus Dallas

O. depressus Dl. [48]

Orsillus maculatus (Fieber)

C. maculatus Fb. [48]

Miridae

Platylygus luridus (Reuter) [43,45]

P. tinctus Uhler [44]

Pentatomidae

Chlorochroa juniperina (L.)

Pitedia juniperina L. [48]

P. (Chlorochroa) juniperina L. [25]

Chlorochroa pinicola (Mulsant and Rey)

Pitedia pinicolana Muls. and Rey. [48]

P. pinicola Mls. [65]

Dolycoris baccarum (L.)

Dolycorus baccarum L. [65]

Halyomorpha mista Uhler [29]

Plautia stali Scott [29,88]

P. stali [28]

Scutellaridae

Poecilocoris lewisi (Distant) [28]

P. lewisi Distant [88]

Tetyra bipunctata (Herrich-Schäffer) [23,44]

T. bipunctata (H.-S.) [15,16]

T. bipunctata H.S. [48]

T. bipunctata (Herrich-Schaeffer) [43]

HOMOPTERA

Phylloxeridae

Adelges cooleyi (Gillette) [23,53,54]

Adelges lariciatus (Patch) [23]

Adelges laricis Vallot [23]

A. strobilobius (Kaltenbach) [23]

Adelges piceae (Ratzeburg) [23]

HYMENOPTERA

Diprionidae

Augomonoctenus libocedrii Rohwer [23,26]

Augomonoctenus smithi (Xiao and Wu) [87]

Neodiprion pratti pratti (Dyar) [15,16,23]

Eurytomidae

Eurytoma bouceki Skrzypczynska

E. bouceki Skrz. [48]

E. bouceki Skrzyp. [75]

E. bouceki Skrzypcz. [30,57,63]

Eurytoma conica Provancher [23]

Eurytoma juniperina Marcovitch [23]

E. juniperiana Marcovitch [21]

E. juniperina Marc. [26]

Eurytoma laricis Yano [28,48,72,75]

E. laricis Jano [73]

Euritoma laricis Yano [65]

Torymidae

Megastigmus albifrons Walker [23,26,27,70]

M. grandiosus Yoshimoto [23]

Megastigmus amicorum Bouček [51]

Megastigmus atedius Walker [9,23,54,70]

M. atedius Walk. [48]

M. piceae Rohwer [9,21,23,26,54]

M. zwoelferi Schefer-Immel [70]

M. zwoelferi Scheffer-Immel [9,73]

M. atedius (Walker) [15,16]

Megastigmus atedius atedius Walker

Megastigmus atedius montana Milliron

M. piceae var. *montana* Milliron [26]

Megastigmus bipunctatus (Swederus)

M. bipunctatus Swed. [48,51,73]

M. bipunctatus (Swed.) [25]

M. kuntzei Kapuściński [25,40]

M. kuntzei Kap. [24,25,48]

Megastigmus borriesi Crosby [28]

M. borriesi [48]

- Megastigmus caperatus* Milliron
Megastigmus certus Nikolskaya
 M. certus Nikolskaja [40]
 M. certus Nik. [48]
 M. cerfus Nic. [73]
Megastigmus chamaecyparidis Kamijo
Megastigmus cryptomeriae Yano [25]
 M. cryptomeriae [28]
Megastigmus ezomatsuanus Hussey and Kamijo [28]
Megastigmus fidus Nikolskaya
 M. fidus Nik. [48]
 M. fidus Nic. [73]
Megastigmus firmae Kamijo
Megastigmus gravis Nikolskaya
 M. gravis Nik. [48]
Megastigmus hoffmeyer Walley
Megastigmus inamur Yano [28]
Megastigmus juniperi Nikolskaya
 M. juniperi Nik. [25,48]
 M. juniperi Nic. [73]
 M. juniperi Nikolskaja [40]
Megastigmus laricis Marcovitch [23]
Megastigmus lasiocarpae Crosby [21,23,26]
 M. lasiocarpae [48]
Megastigmus milleri Milliron [23,26]
 M. milleri [48]
Megastigmus pictus (Förster) [9,30]
 M. pictus Hoffm. [48,73]
 M. pictus (Först.) [56,57,59,63]
 M. pictus (Först.) [63]
 M. pictus Först. [48]
 M. seitneri Hoffmeyer [9]
 M. seitneri Hoffm. [30,56]
 M. seitneri Hoffm. [57,65,71,72,75]
 M. seitneri Ratz. [75]
 M. seitneri Hoffm. [74]
 M. seitneri Hoffm. [83]
Megastigmus pictus (Först.) [63]
Torymus pictus Förster [9]
Megastigmus pinus Parfitt [9,21,23,26,48,70]
 M. pinus Parf. [48]
 M. pinus [24]
Megastigmus pinus crosbyi Hoffmeyer
Megastigmus pinus marginatus Hoffmeyer
Megastigmus pinus pinus Parfitt
Megastigmus rafni Hoffmeyer [21,23,26]
 M. rafni [48]

- Megastigmus schimitschekei* Novitzky [10]
M. schimitschekei Nozitzky [11]
M. schimitschekii Novitz. [48]
Megastigmus somaliensis Hussey [24,25]
Megastigmus specularis Walley [9,23,48,70]
M. groenblomi Kangas [9,48]
M. specularis [48]
Megastigmus spermotrophus Wachtl [21,23,24,26,38,48,53,70]
M. spermotrophus Ratz. [73]
Megastigmus spermotrophus nigrodorsatus Milliron
M. spermotrophus var. *nigrodorsatus* Milliron [26]
Megastigmus spermotrophus spermotrophus Wachtl
Megastigmus strobilobius Ratzeburg [9,60,70]
M. strobilobius Ratz. [38,48,61,73,74,83]
M. strobilobius Seitn. [61]
M. abietis Seitner [9,73]
M. abietis Seitn. [72,83]
Megastigmus suspectus Borries [9,38,48,56,60]
M. suspectus [37]
M. piceae Seitn. [48,83]
M. piceae Seitner [9]
M. bornmulleriana Hussey [9,10,11,48]
M. suspectus Borr. [48,62]
Megastigmus suspectus Borries [83]
Megastigmus suspectus pinsapinis Hoffmeyer
M. suspectus var. *pinsapinis* Hoff. [48]
M. suspectus Borries var. *pinsapinis* Hoff. [48]
M. suspectus var. *pinsapinis* Hoffm. [48]
Megastigmus suspectus suspectus Borries
Megastigmus thuyopsis Yano [25]
Megastigmus tsugae Crosby [23,26]
Megastigmus tsugae heterophyllae Milliron
M. tsugae var. *heterophyllae* Milliron [21,26]
Megastigmus tsugae tsugae Crosby
Megastigmus tsugaphilus Kamijo
Megastigmus validus Nikolskaya
M. validus Nik. [48]
M. validus Nic. [73]
Megastigmus variegatus Strand
Megastigmus wachtli Seitner [11]
M. wachtli Seitn. [25]
M. waachtli Seitner [48]
M. Wachtli Seitner [10]

Xyelidae

- Xyela alberta* (Curran) [23,66]
Xyela apligena (Strobl) [23,66]
X. brunneiceps Rohwer [23,66]
X. middlekauffi Burdick [23,66]

- Xyela bakeri* Konow [14,15,16,23,66]
Xyela californica Rohwer [23,66]
Xyela cheloma Burdick [23,66]
Xyela concava Burdick [23,66]
Xyela curva Benson [66]
Xyela deserti Burdick [23,66]
Xyela dodgei Greenbaum [15,16,23,66]
Xyela exilicornis Maa [66]
Xyela graeca Stein [66]
Xyela helvetica (Benson) [66]
Xyela julii (Brebisson) [66]
X. julii Breb. [76]
Xyela kamtshatica Gussakovskij [66]
Xyela linsleyi Burdick [23,66]
Xyela longula Dalman [66]
Xyela lugdunensis (Berland) [66]
Xyela lunata Burdick [23,66]
Xyela menelaus Benson [66]
Xyela minor Norton [14,15,16,23,66]
Xyela obscura (Strobl) [15,16,23,66]
X. pini Rohwer [14,23,66]
Xyela piliserra Thomson [66]
Xyela priceae Burdick [23,66]
Xyela radiatae Burdick [23,66]
Xyela serrata Burdick [23,66]
Xyela sinicola Maa [66]
Xyela styrax Burdick [23,66]
Xyela ussuriensis Rasnitsyn [66]

LEPIDOPTERA

Argyresthiidae

- Argyresthia anthocephala* Meyrick
A. anthocephala [28]
Argyresthia chrysidella (Peyerimhoff)
Blastotere (= *Argyresthia*) *chrysidella* Peyer. [48]
B. chrysidella Peyer [48,51]
Argyresthia libocedrella Busck [23,26]
Argyresthia pseudotsuga Freeman [53]
Blastotere praecocella Zeller
B. (= *Argyresthia*) *praecocella* Zell. [48]
B. praecocella Zell. [48,51]
Argyresthia praecocella Zell. [10,25]
A. praecocella Z. [25]
Argyresthie praecocella Zell. [11]

Blastobasidae

- Holcocera augusti* Heinrich [23,26]
Holcocera lepidophaga Clarke [14,23]

- Holcocerina immaculella* (McDunnough)
Holcocera immaculella McDunnough [23]
H. immaculella McDermott [53]

Cochylidae

- Henricus fuscodorsanus* (Kearfott)
H. fuscodorsana (Kearfott) [23]
H. fuscodorsana (Kearf.) [26]
Henricus macrocarpanus (Walsingham)
H. macrocarpana (Walsingham) [23]
H. macrocarpana (Wlsh.) [26]
Henricus melanoleucus (Clarke)
Irazona melanoleuca Dyar

Cosmopterigidae

- Periploca atrata* Hodges [23]

Gelechiidae

- Aristotelia latipennella* (Rebel)
Acanthophila latipennella Rbl. [76]
A. latepiella Rebl. [73]
A. letepellia Ratz. [48]
A. piceana Balz. [48]
A. piceana Salz. [74]
A. piceana Sulcz. [73]
Acanthophila piceana [77]
Battaristis vittella (Busck)
Duvita vittella Busck [23]
Brachyacma oxycedrella (Millière)
B. oxycedrella Mill. [48,51]
Chionodes periculella (Busck) [23,26]
Chionodes sabinianus Powell
C. sabinianae Powell [23]
Exoteleia dodecella (L.)
E. dodecella Linnaeus [88]
E. (= Heringia) dodecella L. [76]
Exoteleia burkei Keifer [23]
Exoteleia nepheos Freeman [23]

Geometridae

- Eupithecia abietaria* Goeze [48,72,73]
E. abietaria Goetze [77]
E. abietaria Goeze [74,77]
E. abietaria [6]
E. pini Ratz. [48]
E. pini (Retz.) [6,83]
E. strobilata [6]
E. togata [6]
E. bilunulata [6]

- Eupithecia abietaria deprunneata* Staudinger
E. abietaria var. *deprunneata* St. [73]
E. abietaria var. *debrumeata* St. [60]
E. strobilata deprunneata Staudinger [28]
Eupithecia abietaria gigantea Staudinger [88]
Eupithecia albicapitata Packard [23,26]
Eupithecia bilunulata (Zetterstedt)
E. bilunulata (Zett.) [6,83]
E. bilunulata Zett. [48]
E. strobilata Hb. [48,72,73,74,77]
Eupithecia columbrata McDunnough [23,26]
Eupithecia gigantea Staudinger [28]
E. gigantea St. [60,73]
Eupithecia mutata Pearsall [23]
Eupithecia rufescens Butler
E. rufescens [28]
Eupithecia spermaphaga (Dyar) [23,26]
Nepytia semichusaria (Walker) [15,16,23,43]
N. semichusaria (Wlk.) [14]
Sabulodes niveostriata (Cockerell)
Phengommataea niveostriata (Cockerell) [27]

Pyralidae

- Assara cedrella* (Hampson)
Cateremna cedrella Hamp. [1]
Assara conicolella (Constant)
Cateremna conicolella Const. [48]
C. conicolella Constant [48]
Assara terebrella (Zincken)
A. terebrella Znek. [65]
A. terebrella Zinck [48,61]
Cateremna terebrella Zinck [48]
Hyphantidium terebrella Zinck [48]
H. terebrellum Zinck. [60,72,73]
H. terebrellum Zink. [74,77]
Cryptoblabes angustipennella Ragonot
C. laricana Mutsuura [28]
C. laricana Mat. [88]
Dichocrocis punctiferalis (Guenée)
D. punctiferalis [28]
D. punctiferalis Guenée [81,88]
Dicocrocis punctiferalis [28]
Dioryctria abietella (Denis and Schiffermüller) [27,34,35]
D. abietella Denis & Schiffermüller [28]
D. abietella [28,37]
D. abietella Denis and Schiff [60]
D. abietella (Den. et Schiff.) [30,57,58,59,62,63]
D. abietella (D. and S.) [5,14,26,39,84]
D. abietella D. and S. [52]

- D. abietella* Den. and Schiff. [36,38,61]
D. abietella (Schiff.) [1,3,7,12]
D. abietella Schiff. [6,9,20,65,71,72,73,74,75,77,83,88]
D. abietella F. [41,48,89]
D. abietalla Schiff. [11]
D. ebietella Schiff. [11]
D. abietivorella [88]
Dioryctria abietivorella (Grote) [21,23,34,53,54,55]
D. abietivorella Grote [89]
D. reniculella Grt. [52]
D. abietella (D. and S.) [23]
D. abietinella Grote [48]
Pinipestis reniculella Grote [34]
Dioryctria albobittella (Hulst) [23,26]
D. albobittella Hulst [89]
Dioryctria amatella (Hulst) [14,15,16,23,39,55]
D. amatella Hulst [89]
Dioryctria auranticella (Grote) [21,23,26,27,33,52]
Dioryctria caesirufella Blanchard and Knudson [8]
Dioryctria clarioralis (Walker) [15,16,23,39,55]
D. clarioralis Walk. [80]
D. clarioralis (Wlk.) [14]
Dioryctria disclusa Heinrich [16,23,25,33,39,43,44,55,84]
D. disclusa (Heinrich) [15]
Dioryctria ebeli Mutuura and Munroe [16,23,35]
D. abietella D. and S. [15]
D. abietella (D. and S.) [16,23,39]
D. abietivorella (Grote) [15,16,23]
D. new species (abietella group) [15]
Dioryctria erythropasa (Dyar) [23,26]
Dioryctria horneana (Dyar) [23]
D. horneana Dyar [80]
Dioryctria majorella Dyar [23]
Dioryctria mendacella Staudinger [81]
D. mendacella (Stgr.) [12]
D. mendacella Stgr. [10,11,48,88,89]
Dioryctria merkei Mutuura and Munroe [16,23,35]
D. zimmermani (Grote) [15,16,35,39]
D. new species (zimmermani group) [15]
Dioryctria mutatella Fuchs [5,12,36,38,46,47,48,50,73]
D. mutatella Fchs. [89]
D. mutatella [37]
Dioryctria peltieri Joannis
D. peltieri Joannis [48]
Dioryctria pinicolella Amsel
Dioryctria pineae Staudinger
D. pineae Stgr. [10,11,48,89]

- Doryctria pryeri* Ragonot [33,88]
Salebria laruata Heinrich [28,33]
Phycita pryeri Leech [88]
Dioryctria pseudotsugella Munroe [23,34]
Dioryctria pygmaeella Ragonot [8,23]
Dioryctria reniculelloides Mutuura and Munroe [23,34,54]
D. reniculelloides [21]
D. reniculella Grote [23]
D. reniculella (Grote) [26,34,84]
D. reniculella Grt. [52]
Pinipestis reniculella Grote [34]
Dioryctria resinosella Mutuura
Dioryctria rossi Munroe [23,33]
D. rossi [21]
Dioryctria rubella Hampson⁷
Dioryctria schuetzeella Fuchs [5,34,81]
D. schutzeella (Fuchs) [12]
D. schutzeella Fuchs [36,48,74,77]
D. schutzella Fuchs [73]
D. schutzeella Fuchs [83]
Dioryctria simplicella Heinemann
D. simplicella Heinem. [36]
Dioryctria sylvestrella (Ratzeburg)⁸
D. sylvestrella Rtz. [89]
D. sylvestrella (Ratz.) [5,12]
D. splendidella (H.S.) [12]
D. splendidella Herrich-Schaeffer [81]
D. splendidella Herrich-Schäffer [28,88]
D. splendidella H.S. [5,36]
Dioryctria sysstratiotes Dyar [23]
Dioryctria taedae Schaber and Wood [15,23,55]
Dioryctria yatesi Mutuura and Munroe [16,23,35]
D. taedae Schaber and Wood [23,35]
Herculia phoezalis Dyar
Moodna biviella L. [76]
Vitula lugubrella (Ragonot)
V. sp. near lugubrella (Ragonot) [23]
Vitula pinei Heinrich [23,27]

Tortricidae

- Archips oporana* (L.)
A. picean L. [28]
A. piceana L. [75]
Cacoecia piceana L. [76,77]
Argyrotaenia urbana (Busck)
A. urbana Busck [23]

⁷ Personal communication, Ping-Yuan Wang, Institute of Zoology, Academia Sinica, Beijing, People's Republic of China.

⁸ Listed as damaging second-year cones, shoots, and trunk of pine in Japan [28]; other citations [5,12,36] indicate pine shoot and trunk attacks only.

- Barbara colfaxiana* (Kearfott) [21,23,26,53]
B. colfaxiana Kearfott [48]
B. colfaxiana colfaxiana (Kearf.) [26]
Cydia pseudotsugana Kearf. [26]
Barbara colfaxiana coloradensis (Heinrich) [26]
Barbara colfaxiana taxifoliella (Busck) [26]
Barbara fulgens V. I. Kuznetsov
B. fulgens Vl. Kuzn. [73]
Barbara herrichiana Obratzsov [38,58,60]
B. herrichiana [37,48]
B. herrichiana Obr. [48,58,62]
B. margarotana Obr. [48]
B. margarotana H.S. [46,47]
Evetria margarotana H.S. [11,58]
Retinia margarotana Wocke [58]
Barbara mappana Freeman [23,26]
Barbara osmana Obratzsov
B. osmana Obr. [10,11,48]
Barbara ulteriorana (Heinrich) [26]
Barbara sp.⁹ [21,23,26]
B. colfaxiana siskiyouana (Kearfott) [23]
B. colfaxiana siskiyouana (Kft.) [21,22]
B. colfaxiana siskiyouana (Kearf.) [26]
Choristoneura diversana (Hübner) [88]
C. diversana Hb. [48,65,73,75]
Choristoneura fumiferana (Clemens) [23,43]
Choristoneura lambertiana (Busck) [23]
Choristoneura lambertiana lambertiana (Busck) [23]
Choristoneura lambertiana subretiniana Obratzsov [23]
Choristoneura murinana (Hübner)
C. murinana Hb. [73]
Choristoneura occidentalis Freeman [21,23,53]
Choristoneura pinus Freeman [23]
Choristoneura pinus maritima Freeman [23]
Choristoneura pinus pinus Freeman [23,43,44]
Cydia anaranjada (Miller)
Laspeyresia anaranjada Miller [14,15,16,23,39]
Cydia araucariae (Pastrana)
C. (Laspeyresia) araucariae Pastrana
Cydia bracteata (Fernald)
Laspeyresia bracteata (Fernald) [23]
L. bracteata (Fern.) [26]
L. pallidibasalis Hein. [26]
Cydia colorana Kearfott
Laspeyresia colorana (Kearfott) [23]

⁹ Formerly known as *Barbara colfaxiana siskiyouana* (Kearfott); however, this is an unfortunate misapplication of the specific name of *siskiyouana* that pertains to another moth, *Eucosma siskiyouana* (Kearfott). This true fir cone attacking *Barbara* species differs enough from *Barbara colfaxiana* (Kearfott) to merit a specific name.

- Cydia conicolana* (Heylaerts)
C. conicolana Heyl. [46,48,50]
Laspeyresia conicolana Heyl. [10,11,48]
Enarmonia conicolana Heyl. [47,48]
- Cydia cryptomeriae* (Issiki)
Grapholitha cryptomeriae [28]
- Cydia cupressana* Kearfott
Laspeyresia cupressana (Kearfott) [23]
L. cupressana (Kearf.) [26]
- Cydia ethelinda* (Meyrick)
C. ethelinda Meyr. [3]
- Cydia illutana* (Herrich-Shäffer)
Laspeyresia illutana H.-S. [71,72,73,74,75,77,83]
L. illutana H.S. [48]
- Cydia illutana dahuricolana* (V. I. Kuznetsov)
Laspeyresia illutana var *dahuricolana* Vl. Kuzn. [73]
L. illutana dahuricolana Kuzn. [75]
L. illutana Vl. Kurz. [65]
- Cydia ingens* (Heinrich)
Laspeyresia ingens Heinrich [14,15,16,23,39]
- Cydia injectiva* (Heinrich)
Hedulia injectiva Heinrich [23,26]
Laspeyresia injectiva (Heinrich) [23]
- Cydia kamijoi* (Oku)
- Cydia miscitata* (Heinrich)
Laspeyresia miscitata Heinrich [23,26]
L. miscitata [21]
- Cydia nigra* (Miller)
Laspeyresia nigra Miller [23]
- Cydia piperana* Kearfott
Laspeyresia piperana (Kearfott) [21,23,27]
L. piperana (Kearf.) [26]
- Cydia strobilella* (L.)
C. (Laspeyresia) youngana (Kearfott) [54]
Laspeyresia strobilella L. [10,11,28,61,65,72,73,74,77]
L. strobilella (L.) [6,7]
L. strobilella Ratz. [83]
L. youngana (Kearfott) [21,23,27]
L. youngana (Kearf.) [26]
L. youngana (Kft.) [84]
Lasp. strobilella (L.) [6]
Pseudotomoides strobilellus L. [38]
P. strobilella L. [48]
P. strobilellus (Linnaeus) [88]
- Cydia toreuta* (Grote)
Laspeyresia toreuta (Grote) [15,16,23,27,43,44,70]
L. toreuta Grote [14,39]
- Endopiza piceana* (Freeman)
Polychrosis piceana Freeman [23,26]

- Epinotia hopkinsana* (Kearfott) [23]
E. hopkinsana (Kearf.) [26]
Epinotia hopkinsana cupressi Heinrich [23,26]
Epinotia nigricana (Herrich-Shäffer)
E. nigricana H.S. [38,48]
E. nigricana [37]
Eucosma bobana Kearfott [19,23]
E. bobana Kearf. [26]
Eucosma cocana Kearfott [15,16,23]
Eucosma monitorana Heinrich [23,43,84]
E. monitorana Kearf. [44]
Eucosma ponderosa Powell [23]
Eucosma pylonitis Meyrick
E. pylonitis Meyr. [1,2]
Eucosma rescissoriana Heinrich [23,26]
E. rescissoriana Heinrich [21]
Eucosma siskiyouana (Kearfott) [23]
Eucosma tocullionana Heinrich [15,16,23]
Exapate duratella Heyden
E. duratella Heyd. [48]
Gravitarmata margarotana (Heinemann) [88]
G. retiferana Wocke [28]
G. margarotana (H.S.) [12]
G. margarotana H.S. [48,50]
G. margarotana H.-S. [73]
Evetria (*Gravitarmata*) *retiferana* Weck. [11]
E. (Gravitarmata) retiferana Wck. [10]
E. retiferana Wck. [20]
E. margarotana HS. [10,11]
E. mararotana [88]
E. retiferana Wocke [48]
Retinia retiferana [88]
Lobesia aeolopa Meyrick [28]
Lobesia reliquana Hübner
L. reliquana HB. [71,72,73]
Pammene juniperana (Millière)
P. juniperana Mill. [48,51]
P. thuriferana Cleu [48]
Pammene oxycedrana (Millière)
P. oxycedrana Mill. [48,51]
Pammene pontica Obraztsov [10]
P. pontica Obr. [11,48]
Pseudococcyx tessulatana (Staudinger)
P. tessulatana Stgr. [48]
P. tessulanata Stgr. [48]
Evetria tessulatana Stgr. [10,11]

- Ptycholoma lecheanum* (L.)
P. lecheana (Linnaeus) [88]
Cacoecia lecheana L. [48,73,74,77]
C. lecheana [88]
- Retinia cristata* (Walsingham)
Petrova cristata (Walsingham) [88]
Evetria cristata Walsingham [28]
- Retinia edemoidana* (Dyar)
Petrova sp. poss. *edemoidana* (Dyar) [23]
- Retinia perangustana* Snellen
Petrova perangustana Snellen [30,48,57,58,59]
P. perangustana Snell. [48,63,73,75,88]
P. perangustana Shell. [75]
Semasia perangustana Snell. [83]
Laspeyresia zonovae Flor. [73]
- Retinia immanitana* (V. I. Kuznetsov)
Petrova immanitana Vl. Kuzn. [73]
- Retinia pini* (V. I. Kuznetsov)
Petrova pini Vl. Kuzn. [73]
- Rhyacionia buoliana* (Denis and Schiffermüller)
R. buoliana Schiff. [48,50]
R. buoliana (Schiffermüller) [23]
R. buoliniana Schiff. [46,47]
Rhyacionia buoliana Den. et Schiff. [76]
- Rhyacionia duplana* (Hübner) [88]
- Rhyacionia frustrana* (Comstock) [15,16,23]
- Rhyacionia pinicolana* Doubleday
R. pinicolana (Doubleday) [88]
R. pinicolana Dbld. [47,48,50]
- Satronia tantilla* Heinrich [14,23]
- Spilonota laricana* Heinemann
S. laricana Heineman [28]
S. laricana Hein. [48,71,72,75]
S. laricana Z. [73]
S. laricana (Heinemann) [88]
Spilonota laricana Hein. [48]
- Zeiraphera canadensis* Mutuura and Freeman
Z. ratzeburgiana Saxen [48]
Z. ratzeburgiana Sax. [73,74,76,77]
Semasia ratzeburgiana Rtz. [72]
- Zeiraphera diniana* Guenée [48]
Z. diniana Guen. [48]
Zeiraphera diniana Gn. [75]
- Zeiraphera improbana* (Walker)
Z. diniana (Guenée) [27]
Z. diniana Guenée [88]
- Zeiraphera rufimitrana* (Herrich-Schäffer) [88]
Z. rufimitrana H.S. [38,48,73]
Z. rufimitrana [37]

THYSANOPTERA

Phlaeothripidae

- Gnophothrips fuscus* (Morgan) [15,16,23]
G. piniphilus Cwfd. [14]
Leptothrips pini (Watson) [23]
Cryptothrips pini (Watson) [23]

Thripidae

- Chilothrips pini* Hood [23]
Frankliniella bispinosa (Morgan) [23]
Frankliniella occidentalis (Pergande) [23]
Frankliniella tritici (Fitch) [14,23]
Oxythrips ajugae Uzel [65,76]
Oxythrips bicolor (Reuter)
O. brevistylis Tryb. [76]
Oxythrips pallidiventrtris Hood [23]
O. pallidiventrtris Hd. [14]
Thrips pini (Uzel)
Taeniothrips pini Uzel. [76]

CLASS ARACHNIDA

ACARI

Eriophyidae

- Eriophyes* (? = *Trisetacus*) *pini floricolus* Trotter [68]
Eriophyes (? = *Trisetacus*) *ramosus* Hodgkiss [68]
E. ramosus Hodgkiss [24,67,68]
Phytoptus (? = *Trisetacus*) *quadrissetus* Thomas [68]
Trisetacus quadrissetus (Thomas) [67,68]
T. quadrissetus Thomas [21]
T. quadrissetus Thom. [48,51]
Trisetacus abietivagrans Kadono [68]
Trisetacus batonrougei Smith [67,68]
Trisetacus chamaecypari Smith [68]
Trisetacus kirghisorum Schevchenko [67,68]
Trisetacus macrocarpae Smith [68]
Trisetacus neoquadrissetus (Smith) [67,68]

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