

◆ Normes OEPP ◆

SECURITE DE LA LUTTE BIOLOGIQUE

LISTE D'AGENTS DE LUTTE BIOLOGIQUE LARGEMENT
UTILISES DANS LA REGION OEPP

PM 6/3 Français

VERSION 2019



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APPROBATION

Les Normes OEPP sont approuvées par le Conseil de l'OEPP. La date d'approbation figure dans chaque norme. Selon les termes de l'Article II de la CIPV, il s'agit de Normes régionales pour les membres de l'OEPP.

REVISION

Les Normes OEPP sont sujettes à des révisions et des amendements périodiques. La prochaine date de révision de cette série de Normes OEPP est décidée par le Groupe de travail pour l'étude de la réglementation phytosanitaire.

ENREGISTREMENT DES AMENDEMENTS

Des amendements sont préparés si nécessaires, numérotés et datés. Les dates de révision figurent (si nécessaire) dans chaque norme individuelle.

DISTRIBUTION

Les Normes OEPP sont distribuées par le Secrétariat de l'OEPP à tous les Etats membres de l'OEPP. Des copies sont disponibles, sous certaines conditions, auprès du Secrétariat de l'OEPP pour toute personne intéressée.

CHAMP D'APPLICATION

Les Normes OEPP sur la sécurité de la lutte biologique sont destinées aux ONPV ou aux organismes équivalents, en leur qualité d'autorités responsables de la surveillance et, le cas échéant, de la réglementation de l'importation et de l'utilisation des agents de lutte biologique.

VUE D'ENSEMBLE

Les ONPV de la région OEPP soutiennent en général l'utilisation de la lutte biologique en protection des végétaux, dans la mesure où, comme d'autres éléments de la lutte intégrée, elle réduit les risques pour la santé humaine et pour l'environnement. L'utilisation des auxiliaires peut, toutefois, comporter certains risques, en particulier pour l'environnement dans le cas des agents non-indigènes introduits à partir d'autres continents, et pour l'applicateur lorsque les agents prennent la forme de produits phytosanitaires formulés. Ce dernier cas est en général couvert par les Normes OEPP de la série PP, concernant les produits phytosanitaires. L'objectif des Normes OEPP sur la sécurité de la lutte biologique est de fournir aux ONPV des directives pour l'évaluation et la réduction des risques occasionnés par diverses étapes de l'introduction et de l'utilisation des agents de lutte biologique et, le cas échéant, de les comparer avec les avantages en termes d'efficacité. Les Normes OEPP préconisent que le cadre administratif pour l'introduction et l'utilisation des auxiliaires reste léger, afin d'éviter autant que possible dans la pratique tout conflit avec la politique générale de promotion de la lutte biologique.

Sécurité de la lutte biologique

LISTE D'AGENTS DE LUTTE BIOLOGIQUE LARGEMENT UTILISES DANS LA REGION OEPP

Champ d'application spécifique

Cette norme donne une liste d'agents de lutte biologique largement utilisés dans la région OEPP, afin de faciliter les décisions concernant l'importation et le lâcher d'agents de lutte biologiques dans les pays de l'OEPP.

Approbation et amendement spécifiques

Approbation initiale en 2001-09. Les révisions de la liste ne sont pas soumises à l'approbation du Conseil de l'OEPP, mais sont décidées par le Groupe d'experts sur la sécurité de la lutte biologique. Dernière révision en 2002-03.

Introduction

Les Normes OEPP PM 6/1 et PM 6/2 fournissent des directives aux autorités nationales de la région OEPP sur l'introduction et le lâcher d'agents exotiques de lutte biologique, afin d'identifier et d'éviter les risques pour les écosystèmes agricoles et naturels. Ces normes sont destinées à être utilisées en relation avec des introductions futures, et non pas rétrospectivement pour d'anciennes introductions. L'expérience et les connaissances accumulées sur l'utilisation des agents de lutte biologique introduits dans un certain nombre de pays de la région OEPP suffisent pour indiquer l'absence de risques significatifs, ou l'existence de mesures appropriées pour la gestion du risque, pour de nombreux agents.

Liste d'agents de lutte biologique

Cette liste spécifie donc les agents de lutte biologique indigènes, introduits et établis¹ qui sont reconnus par le Groupe d'experts OEPP sur la sécurité de la lutte biologique comme ayant été largement utilisés dans plusieurs pays OEPP. D'autres pays OEPP peuvent donc présumer, avec une certaine confiance, que ces agents peuvent être introduits et utilisés en sécurité. Ils peuvent, d'après leur jugement, se passer de, ou simplifier, les procédures de notification proposées dans les Normes OEPP PM 6/1 et PM 6/2.

Les agents sont ajoutés à la liste sur la base d'un jugement d'experts sur les informations disponibles.

Des critères larges sont appliqués, de manière flexible :

1. agent de lutte biologique classique utilisé avec succès ou
2. agent de lutte biologique qui est (ou a été) commercialisé et qui soit est indigène et largement réparti dans la région OEPP, soit est établi et largement réparti dans la région OEPP, soit a été utilisé pendant au moins 5 ans et dans au moins cinq pays OEPP (exceptionnellement moins, par ex. cultures cultivées dans quelques pays seulement).

Les microorganismes utilisés pour la lutte biologique ne sont pas pris en compte (car ils sont couverts par la Directive de l'UE 91/414 ou des réglementations équivalentes dans la plupart des pays OEPP).

L'absence d'un organisme donné sur la liste ne signifie pas qu'il n'est pas sûr, mais qu'il n'a pas encore été étudié, ou que des incertitudes nécessitent qu'il soit encore étudié, ou que son utilisation est trop récente pour pouvoir l'ajouter à la liste. La liste (établie en langue anglaise) est mise à jour chaque année. Elle est divisée en deux parties : agents de lutte biologique commercialisés (annexe I) et agents de lutte biologique introduit avec succès (annexe II).

¹ Par rapport à la NIMP no. 3, cela signifie les agents de lutte biologique originaires de la région OEPP (c'est-à-dire indigènes), ou les agents de lutte biologique lâchés dans un écosystème de la région OEPP où ils n'étaient pas présents (sans nécessairement s'établir) (c'est-à-dire introduits) ou les agents de lutte biologique persistants dans un avenir prévisible après leur introduction dans la région OEPP (c'est-à-dire établis).

[Annexes en anglais seulement]

APPENDIX I - Commercially used biological control agents

Further details are given for each agent on its name, common synonyms, taxonomic classification, the pests against which it is mostly targeted, its origin, the date of first use as a commercial agent. Countries where it is or has been used in the EPPO region are listed, on the basis of information provided by the industry and by some EPPO countries. This information was not available from all EPPO countries and may therefore be incomplete. Each agent has been used commercially at some time in the countries listed, but in some cases may no longer be commercially available or used there. Information is also given, when available, on natural distribution of the agent in the EPPO region, whether it is used in the field or under protected conditions. Additional remarks are appended when needed.

INSECTA

Coleoptera

Adalia bipunctata
Aleochara bilineata
Atheta coriaria
Chilocorus baileyi
Chilocorus bipustulatus
Chilocorus circumdatus
Chilocorus nigrita
Coccinella septempunctata
Cryptolaemus montrouzieri
Delphastus catalinae
Propylea quatuordecimpunctata
Rhyzobius lophanthae
Rodolia cardinalis
Scymnus rubromaculatus
Stethorus punctillum

Diptera

Aphidoletes aphidimyza
Episyrphus balteatus
Feltiella acarisuga
Sphaerophoria rueppellii

Hemiptera/Heteroptera

Anthocoris nemoralis
Anthocoris nemorum
Macrolophus pygmaeus
Orius albidipennis
Orius laevigatus
Orius majusculus
Picromerus bidens
Podisus maculiventris

Hymenoptera

Acerophagus maculipennis
Anagrus atomus
Anagrus fusciventris
Anagrus pseudococci
Aphelinus abdominalis
Aphidius colemani
Aphidius ervi
Aphidius matricariae
Aphytis diaspidis
Aphytis holoxanthus
Aphytis lingnanensis
Aphytis melinus
Aprostocetus hagenowii
Bracon hebetor
Coccophagus lycimnia

Coccophagus rusti
Coccophagus scutellaris
Compariella bifasciata
Cotesia marginiventris
Dacnusa sibirica
Diglyphus isaea
Encarsia citrina
Encarsia formosa
Encyrtus aurantii
Encyrtus infelix
Ephedrus cerasicola
Eretmocerus eremicus
Eretmocerus mundus
Gyranusoidea litura
Leptomastidea abnormis
Leptomastix dactylopii
Leptomastix epona
Metaphycus flavus
Metaphycus helvolus
Metaphycus lounsburyi
Metaphycus swirskii
Microterys nietneri
Opius pallipes
Praon volucre
Scutellista caerulea
Tetracnemoidea peregrina
Tetracnemoidea brevicornis
Thripobius javae
Trichogramma brassicae
Trichogramma cacoeciae
Trichogramma dendrolimi
Trichogramma evanescens
Trichogramma pintoi
Trichopria drosophilae

Neuroptera

Chrysoperla carnea

Thysanoptera

Franklinothrips megalops
Franklinothrips vespiformis
Karnyothrips melaleucus

ARACHNIDA

Acarina

Amblydromalus limonicus
Amblyseius andersoni
Amblyseius barkeri
Amblyseius degenerans
Amblyseius swirskii

Cheyletus eruditus
Euseius gallicus
Hypoaspis aculeifer
Macrocheles robustulus
Metaseiulus occidentalis
Neoseiulus californicus
Neoseiulus cucumeris
Phytoseiulus persimilis
Stratiolaelaps scimitus
Transeius montdorensis
Typhlodromus pyri

NEMATODA

Heterorhabditis bacteriophora
Heterorhabditis megidis
Phasmarhabditis hermaphrodita
Steinernema carpocapsae
Steinernema feltiae
Steinernema glaseri
Steinernema kraussei

Insecta, Coleoptera

Adalia bipunctata

Family	Coccinellidae
Main target pests	Aphididae
Original distribution	Palearctic (?)
Distribution in EPPO	Widespread
Date of first use	?
EPPO countries where used	Belgium, Denmark, Germany, Italy, Netherlands, Portugal, Switzerland
Use	Indoors

Aleochara bilineata

Family	Staphylinidae
Main target pests	<i>Delia antiqua</i> , <i>Delia radicum</i> (= <i>Delia brassicae</i>)
Original distribution	Northern and Middle Europe, Canada and USA
Distribution in EPPO	Widespread
Date of first use	1997 (in Netherlands)
EPPO countries where used	Netherlands, some other European countries
Use	Outdoors

Atheta coriaria

Synonyms	<i>Atheta brachelytra</i> , <i>Dalotia coriaria</i> , <i>Homalota coriaria</i>
Family	Staphylinidae
Original distribution	Europe, Northern Asia, North America, Oceania, widespread in EPPO region
Main target pests	Thripidae (thrips), Sciariidae (fungus gnats), Ephydriidae (shore flies)
Date of first use	2002 (Biobest)
EPPO countries where used	Belgium, France, Germany, Netherlands, Poland, Spain, Switzerland, United Kingdom
Use	Indoors

Chilocorus baileyi

Family	Coccinellidae
Main target pests	Diaspididae
Original distribution	Australia
Distribution in EPPO	Not established
Date of first use	1985
EPPO countries where used	Belgium, France, Netherlands
Use	Indoors

Chilocorus bipustulatus

Family	Coccinellidae
Main target pests	Diaspididae, Coccidae (<i>Saissetia oleae</i>)
Original distribution	South Palaearctic
Distribution in EPPO	Widespread (South and Central)
Date of first use	1959
EPPO countries where used	Belgium, France, Greece, Israel, Italy, Netherlands, Turkey
Use	Outdoors/Indoors

Chilocorus circumdatus

Family	Coccinellidae
Main target pests	Diaspididae
Original distribution	S. E. Asia
Distribution in EPPO	Not established
Date of first use	1985
EPPO countries where used	Belgium, France, Netherlands
Use	Indoors

Chilocorus nigrita

Family	Coccinellidae
Main target pests	Diaspididae, Asterolecaniidae
Original distribution	S. Asia
Distribution in EPPO	Not established
Date of first use	1985
EPPO countries where used	Belgium, Denmark, France, Germany, Netherlands, UK
Use	Indoors

Coccinella septempunctata

Family	Coccinellidae
Main target pests	Aphididae
Original distribution	Palaearctic
Distribution in EPPO	Widespread
Date of first use	1980
EPPO countries where used	France, Germany, Portugal
Use	Outdoors

Cryptolaemus montrouzieri

Family	Coccinellidae
Main target pests	<i>Planococcus citri</i>
Original distribution	Australia
Distribution in EPPO	Mediterranean area
Date of first use	1985
EPPO countries where used	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Ireland, Italy, Jersey, Netherlands, Norway, Poland, Portugal, Russia, Slovakia, Spain, Sweden, Switzerland, Tunisia, UK
Use	Indoors/outdoors

Delphastus catalinae

Synonym	<i>Delphastus pusillae</i>
Family	Coccinellidae
Main target pests	Aleyrodidae (<i>Trialeurodes vaporariorum</i> , <i>Bemisia tabaci</i>)
Original distribution	Nearctic/Neotropic
Distribution in EPPO	Not established
Date of first use	1993
EPPO countries where used	Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Jordan, Netherlands, Poland, Russia, Spain, Tunisia, UK (restricted under license)
Use	Indoors

Propylea quatuordecimpunctata

Synonyms	<i>Propylaea 14-punctata</i> , <i>Calvia</i>
Family	Coccinellidae
Main target pests	great variety of aphids belonging to the superfamily of Aphidoidea
Original distribution	Native to the Palearctic region and widely distributed in Europe, established in the Nearctic region.
Distribution in EPPO	Albania, Austria, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Luxembourg, Macedonia, Malta, Moldova, Norway, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, the Netherlands, Turkey, Ukraine.
Date of first use	2018
EPPO countries where used	Belgium, Italy, Luxembourg, the Netherlands, Spain, UK and Benelux
Use	Indoors/outdoors

Rhyzobius lophanthae

Synonym	<i>Lindorus lophanthae</i>
Family	Coccinellidae
Main target pests	Diaspididae (<i>Pseudolacaspis pentagona</i>), <i>Quadraspidiotus perniciosus</i> , <i>Chrysomphalus dictyospermi</i> , <i>Parlatoria blanchardi</i>
Original distribution	Australia
Distribution in EPPO	Mediterranean, Russia
Date of first use	1980
EPPO countries where used	Belgium, Denmark, Germany, Greece, Israel, Italy, Netherlands, Portugal, Switzerland, Turkey
Use	Indoors

Rodolia cardinalis

Family	Coccinellidae
Main target pests	<i>Icerya purchasi</i>
Original distribution	Australia
Distribution in EPPO	Mediterranean, CIS
Date of first use	?1980s
EPPO countries where used	Belgium, Netherlands
Use	Indoors/outdoors

Scymnus rubromaculatus

Family	Coccinellidae
Main target pests	Aphididae
Original distribution	Central Europe
Distribution in EPPO	Finland, Estonia, Lithuania
Date of first use	1990
EPPO countries where used	Belgium, France, Netherlands, Portugal
Use	Indoors

Stethorus punctillum

Family	Coccinellidae
Main target pests	<i>Panonychus ulmi</i>
Original distribution	Palaeartic
Distribution in EPPO	Widespread
Date of first use	1995
EPPO countries where used	Belgium, France, Germany, Netherlands, Portugal, Spain, Sweden
Use	Indoors

Insecta, Diptera***Aphidoletes aphidimyza***

Family	Cecidomyiidae
Main target pests	Aphididae (<i>Aphis gossypii</i> , <i>Myzus persicae</i> , <i>Macrosiphum</i> sp., <i>Aulacorthum</i> sp.)
Original distribution	Central Europe, Palaeartic
Distribution in EPPO	Widespread
Date of first use	1985
EPPO countries where used	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Hungary, Ireland, Italy, Jersey, Jordan, Lithuania, Malta, Morocco, Netherlands, Norway, Poland, Portugal, Spain, Slovakia, Sweden, Switzerland, Tunisia, UK
Use	Indoors/outdoors

Episyrphus balteatus

Family	Syrphidae
Main target pests	Aphididae
Original distribution	Europe
Distribution in EPPO	Widespread
Date of first use	1995
EPPO countries where used	Belgium, Denmark, Germany, Italy, Netherlands, Portugal
Use	Indoors/outdoors

Feltiella acarisuga

Synonyms	<i>Feltiella tetranychii</i> , <i>Therodiplosis persicae</i>
Family	Cecidomyiidae
Main target pests	<i>Tetranychus urticae</i> , <i>T. cinnabarinus</i>
Original distribution	W. Europe/Mediterranean
Distribution in EPPO	Widespread
Date of first use	1995
EPPO countries where used	Belgium, Czechia, Denmark, Finland, France, Germany, Guernsey, Ireland, Italy, Lithuania, Netherlands, Norway, Poland, Spain, Sweden, Switzerland, UK
Use	Indoors

Sphaerophoria rueppellii

Synonyms	<i>Sphaerophoria flavicauda</i> , <i>Sphaerophoria nitidicollis</i>
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Family	Syrphidae
Main target pests	Mainly Aphididae but also whiteflies, thrips and spider mites
Original distribution	Widely distributed in Palaearctic and Afrotropical regions
Distribution in EPPO	Mediterranean region
Date of first use	2012
EPPO countries where used	Spain
Use	Indoors/outdoors

Insecta, Hemiptera/Heteroptera

Anthocoris nemoralis

Family	Anthocoridae
Main target pests	Psyllidae (orchards)
Original distribution	Palaearctic
Distribution in EPPO	Widespread
Date of first use	?
EPPO countries where used	Belgium, Denmark, Germany, Netherlands
Use	Outdoors

Anthocoris nemorum

Family	Anthocoridae
Main target pests	<i>Cacopsylla pyri</i> , thrips
Original distribution	Palaearctic
Distribution in EPPO	Widespread
Date of first use	1992
EPPO countries where used	Belgium, Denmark, France, Italy, Jersey, Netherlands, UK
Use	Outdoors

Macrolophus pygmaeus

Family	Miridae
Main target pests	Aleyrodidae
Original distribution	Palaearctic
Distribution in EPPO	Widespread
Date of first use	1990
EPPO countries where used	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Hungary, Ireland, Italy, Jordan, Lithuania, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Tunisia, Turkey, UK (restricted under license)
Use	Indoors

Additional remark	<ol style="list-style-type: none"> 1) <i>Macrolophus pygmaeus</i> was previously included on the positive list under the name <i>Macrolophus melanotoma</i> (synonym: <i>Macrolophus caliginosus</i>), this error was found and corrected in 2009; 2) <i>Macrolophus pygmaeus</i> has been reported as damaging on cherry tomato and on <i>Gerbera</i>. It is therefore not recommended for use on these crops. Caution is advised when using <i>M. pygmaeus</i> on any new crop, particularly ornamentals with a low threshold for cosmetic damage.
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Orius albidipennis

Family	Anthocoridae
Main target pests	Thrips
Original distribution	Mediterranean, palaearctic
Distribution in EPPO	Mediterranean
Date of first use	1991

EPPO countries where used Belgium, France, Israel, Italy, Netherlands, Spain
Use Indoors

Orius laevigatus

Family Anthocoridae
Main target pests Thripidae (*Frankliniella occidentalis*, *Thrips tabaci*)
Original distribution Palaearctic (except north)
Distribution in EPPO Widespread (except north)
Date of first use 1991
EPPO countries where used Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Hungary, Ireland, Italy, Jersey, Jordan, Lithuania, Malta, Morocco, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Switzerland, Tunisia, UK
Use Indoors

Orius majusculus

Family Anthocoridae
Main target pests Thripidae (*Frankliniella occidentalis*, *Thrips tabaci*)
Original distribution Palaearctic
Distribution in EPPO Widespread
Date of first use 1991
EPPO countries where used Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Italy, Jersey, Lithuania, Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland, UK
Use Indoors

Picromerus bidens

Family Pentatomidae
Main target pests Lepidoptera
Original distribution Palaearctic (also established in Nearctic)
Distribution in EPPO Widespread
Date of first use 1990
EPPO countries where used CIS countries, Germany, Poland, Russia
Use Outdoors/indoors

Podisus maculiventris

Family Pentatomidae
Main target pests Lepidoptera, *Leptinotarsa decemlineata*
Original distribution North and South America
Distribution in EPPO Not established
Date of first use 1996
EPPO countries where used Belgium, Bulgaria, Denmark, Finland, France, Greece, Italy, Netherlands, Russia, Spain
Use Indoors/outdoors

Insecta, Hymenoptera

Acerophagus maculipennis

Synonym *Pseudaphycus maculipennis*²
Family Encyrtidae
Main target pests Pseudococcidae
Original distribution Palaearctic
Distribution in EPPO Widespread (south)

² The genus *Pseudaphycus* was synonymized with the genus *Acerophagus*: Trjapitzin VA (2008) A Review of Encyrtid Wasps (Hymenoptera, Chalcidoidea, Encyrtidae) of Macaronesia. *Entomological Review*, Vol. 88, No. 2, pp. 218–232.

Date of first use	1980
EPPO countries where used	Belgium, France, Germany, Netherlands, Spain
Use	Indoors
<i>Anagrus atomus</i>	
Family	Mymaridae
Main target pests	Cicadellidae
Original distribution	Palearctic
Distribution in EPPO	?
Date of first use	1994
EPPO countries where used	Belgium, France, Germany, Guernsey, Jersey, Netherlands, Spain, UK
Use	Indoors
<i>Anagrus fusciventris</i>	
Family	Encyrtidae
Main target pests	Pseudococcidae
Original distribution	Australia
Distribution in EPPO	Not present
Date of first use	1990
EPPO countries where used	Belgium, Denmark, France, Germany, Netherlands, Spain
Use	Indoors
<i>Anagrus pseudococci</i>	
Family	Encyrtidae
Main target pests	Pseudococcidae
Original distribution	Mediterranean
Distribution in EPPO	Mediterranean
Date of first use	1995
EPPO countries where used	France, Czechia, Greece, Italy, Netherlands, Portugal, Spain
Use	Indoors/outdoors
<i>Aphelinus abdominalis</i>	
Family	Aphelinidae
Main target pests	Aphididae (<i>Macrosiphum euphorbiae</i> , <i>Aulacorthum solani</i>)
Original distribution	Europe
Distribution in EPPO	Widespread
Date of first use	1992
EPPO countries where used	Austria, Belgium, Bulgaria, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Ireland, Italy, Jersey, Jordan, Netherlands, Poland, Spain, Sweden, Switzerland, Tunisia, UK
Use	Indoors
<i>Aphidius colemani</i>	
Family	Braconidae
Main target pests	Aphididae (<i>Aphis gossypii</i> , <i>Myzus persicae</i> , <i>M. nicotianae</i>)
Original distribution	North Africa, Middle East, India
Distribution in EPPO	Mediterranean area
Date of first use	1992
EPPO countries where used	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Hungary, Ireland, Italy, Jersey, Jordan, Lithuania, Malta, Morocco, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Tunisia, Turkey, UK
Use	Indoors
<i>Aphidius ervi</i>	
Family	Braconidae
Main target pests	<i>Aulacorthum solani</i> , <i>Macrosiphum euphorbiae</i>

Original distribution	Palearctic
Distribution in EPPO	Widespread
Date of first use	1995
EPPO countries where used	Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Hungary, Ireland, Italy, Jersey, Lithuania, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, UK
Use	Indoors/outdoors

Aphidius matricariae

Family	Braconidae
Main target pests	<i>Myzus persicae</i>
Original distribution	Holarctic
Distribution in EPPO	Widespread in temperate regions
Date of first use	1990
EPPO countries where used	Austria, Belgium, Germany, Guernsey, Jersey, Netherlands, Poland, Portugal, Slovakia, UK
Use	Indoors

Aphytis diaspidis

Family	Aphelinidae
Main target pests	Diaspididae, <i>Quadraspidiotus perniciosus</i> , <i>Pseudaulacaspis pentagona</i>
Original distribution	California
Distribution in EPPO	Mediterranean
Date of first use	?
EPPO countries where used	Netherlands
Use	Indoors

Aphytis holoxanthus

Family	Aphelinidae
Main target pests	Diaspididae
Original distribution	Asia
Distribution in EPPO	Mediterranean
Date of first use	1996
EPPO countries where used	Belgium, Czechia, France, Netherlands, Spain
Use	Indoors

Aphytis lingnanensis

Family	Aphelinidae
Main target pests	<i>Aonidiella aurantii</i> , <i>Chrysomphalus dictyospermi</i>
Original distribution	Probably eastern Asia (widely established elsewhere)
Distribution in EPPO	Mediterranean
Date of first use	?
EPPO countries where used	Greece, Italy, Spain
Use	Indoors/outdoors

Aphytis melinus

Family	Aphelinidae
Main target pests	<i>Aonidiella aurantii</i>
Original distribution	India/Pakistan
Distribution in EPPO	Mediterranean
Date of first use	1985
EPPO countries where used	Belgium, Czechia, Denmark, France, Greece, Italy, Portugal, Spain
Use	Outdoors/indoors

Aprostocetus hagenowii

Synonyms	<i>Tetrastichus hagenowii</i> , <i>Tetrastichodes hagenowii</i>
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Family	Eulophidae
Main target pests	Blattidae (<i>Periplaneta</i> spp.)
Original distribution	?
Distribution in EPPO	Romania
Date of first use	1993
EPPO countries where used	Belgium, France, Germany, Netherlands, Spain
Use	Indoors

Bracon hebetor

Synonyms	<i>Habrobracon hebetor</i>
Family	Braconidae
Main target pests	Lepidoptera (on stored products)
Original distribution	India, New England
Distribution in EPPO	Mediterranean area (mostly Eastern)
Date of first use	1980
EPPO countries where used	Many (including Germany, Portugal)
Use	Indoors

Coccophagus lycimnia

Family	Aphelinidae
Main target pests	Coccidae
Original distribution	Cosmopolitan
Distribution in EPPO	Mediterranean
Date of first use	1988
EPPO countries where used	Belgium, Denmark, France, Germany, Netherlands, Portugal, Spain, Sweden
Use	Indoors

Coccophagus rusti

Family	Aphelinidae
Main target pests	Coccidae
Original distribution	Cosmopolitan
Distribution in EPPO	Mediterranean
Date of first use	1988
EPPO countries where used	Belgium, France, Netherlands, Spain
Use	Indoors

Coccophagus scutellaris

Family	Aphelinidae
Main target pests	Coccidae
Original distribution	Cosmopolitan
Distribution in EPPO	Widespread
Date of first use	1986
EPPO countries where used	Belgium, France, Netherlands, Portugal, Spain
Use	Indoors

Comperiella bifasciata

Family	Encyrtidae
Main target pests	Diaspididae (<i>Chrysomphalus aonidum</i> , <i>Aonidiella aurantii</i>)
Original distribution	?California/South China
Distribution in EPPO	Mediterranean
Date of first use	1985
EPPO countries where used	Belgium, Greece, Netherlands
Use	Indoors/outdoors

Cotesia marginiventris

Synonyms	<i>Apanteles marginiventris</i>
Family	Braconidae
Main target pests	Lepidoptera (Noctuidae)
Original distribution	Americas
Distribution in EPPO	?
Date of first use	1993
EPPO countries where used	Belgium, France, Netherlands, Spain
Use	Indoors

Dacnusa sibirica

Family	Braconidae
Main target pests	Agromyzidae (<i>Liriomyza</i> spp.)
Original distribution	Palaearctic, Europe
Distribution in EPPO	Widespread, temperate regions
Date of first use	1981
EPPO countries where used	Austria, Belgium, Bulgaria, Czechia, Denmark, Finland, France, Germany, Guernsey, Italy, Jersey, Jordan, Malta, Morocco, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, UK
Use	Indoors/outdoors (celery, lettuce)

Diglyphus isaea

Family	Eulophidae
Main target pests	Agromyzidae (<i>Liriomyza</i> spp.)
Original distribution	Palearctic
Distribution in EPPO	Widespread
Date of first use	1984
EPPO countries where used	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Hungary, Italy, Jordan, Malta, Morocco, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Tunisia, Turkey, UK
Use	Indoors/outdoors

Encarsia citrina

Family	Aphelinidae
Main target pests	Diaspididae
Original distribution	Cosmopolitan
Distribution in EPPO	Mediterranean
Date of first use	1984
EPPO countries where used	Belgium, France, Germany, Netherlands, Spain
Use	Indoors

Encarsia formosa

Family	Aphelinidae
Main target pests	Aleyrodidae (<i>Trialeurodes vaporariorum</i> , <i>Bemisia tabaci</i>)
Original distribution	Southern nearctic
Distribution in EPPO	Widespread
Date of first use	1930
EPPO countries where used	Austria, Belgium, Bulgaria, Czechia, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Jordan, Lithuania, Malta, Morocco, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Tunisia, Turkey, UK
Use	Indoors

Encyrtus aurantii

Synonyms	<i>Encyrtus lecaniorum</i>
Family	Encyrtidae
Main target pests	Coccidae
Original distribution	Palearctic
Distribution in EPPO	Widespread (south)
Date of first use	1980
EPPO countries where used	Belgium, France, Germany, Netherlands, Spain
Use	Indoors

Encyrtus infelix

Synonyms	<i>Eucomys tananarivensis</i>
Family	Encyrtidae
Main target pests	Coccidae
Original distribution	Afrotropical region
Distribution in EPPO	Israel
Date of first use	1992
EPPO countries where used	Belgium, Denmark, France, Netherlands, Spain
Use	Indoors

Ephedrus cerasicola

Family	Braconidae
Main target pests	<i>Aphis frangulae</i> , <i>A. gossypii</i> , <i>Aulacorthum circumflexum</i> , <i>Aulacorthum</i>

solani, *Brachycaudus helichrysi*, *Capitophorus inulae*, *Cavariella aegopodii*, *Chaetosiphon fragaefolii*, *Cryptomyzus galeopsidis*, *Dysaphis apiifolia*, *Dysaphis sp.*, *Hyadaphis foeniculi*, *Hyperomyzus lactucae*, *Hyperomyzus sp.*, *Myzus ascalonicus*, *M. cerasi*, *M. ligustri*, *M. nicotinae*, *M. ornatus*, *M. persicae*, *Nasonovia ribisnigri*, *Nasonovia sp.*, *Ovatus crataegarius*, *Phorodon humili*, *Rhodobium porosum*

Original distribution	Naturally throughout Europe
Distribution in EPPO	Widespread
Date of first use	1999
EPPO countries where used	Belgium, Denmark, Finland, France, Germany, Netherlands, UK
Use	Indoors

Eretmocerus eremicus

Family	Aphelinidae
Main target pests	<i>Bemisia tabaci</i>
Original distribution	Southern nearctic
Distribution in EPPO	Mediterranean
Date of first use	1994
EPPO countries where used	Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Hungary, Italy, Lithuania, Malta, Morocco, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Switzerland, Tunisia, Turkey
Use	Indoors

Eretmocerus mundus

Family	Aphelinidae
Main target pests	<i>Bemisia tabaci</i>
Original distribution	South Europe
Distribution in EPPO	Mediterranean
Date of first use	1996
EPPO countries where used	Denmark, Germany, Italy, Netherlands, Portugal, Spain
Use	Indoors

Gyranusoidea litura

Family	Encyrtidae
Main target pests	<i>Pseudococcus longispinus</i>
Original distribution	Africa
Distribution in EPPO	France, Spain
Date of first use	1990
EPPO countries where used	Belgium, France, Netherlands
Use	Indoors

Leptomastidea abnormis

Synonym	<i>Leptomastix abnormis</i>
Family	Encyrtidae
Main target pests	Pseudococcidae
Original distribution	Palaeartic
Distribution in EPPO	Widespread
Date of first use	1984
EPPO countries where used	Austria, Belgium, Denmark, Germany, Guernsey, Israel, Italy, Jersey, Netherlands, Spain, Switzerland, Turkey, UK
Use	Indoors

Leptomastix dactylopii

Family	Encyrtidae
Main target pests	<i>Planococcus citri</i>
Original distribution	Neotropic

Distribution in EPPO	Mediterranean area
Date of first use	1992
EPPO countries where used	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Ireland, Italy, Jersey, Netherlands, Norway, Poland, Portugal, Spain, UK
Use	Indoors/outdoors

Leptomastix epona

Family	Encyrtidae
Main target pests	Pseudococcidae, especially <i>Pseudococcus viburni</i>
Original distribution	Palearctic
Distribution in EPPO	Widespread (south)
Date of first use	1992
EPPO countries where used	Belgium, Denmark, France, Germany, Guernsey, Jersey, Netherlands, Spain, UK
Use	Indoors

Metaphycus flavus

Family	Encyrtidae
Main target pests	Coccidae, <i>Saissetia oleae</i> , <i>Coccus hesperidum</i>
Original distribution	Nearctic
Established in EPPO	Yes
Distribution in EPPO	Mediterranean
Date of first use	1999
EPPO countries where used	Germany, Netherlands, Switzerland
Use	Indoors

Metaphycus helvolus

Family	Encyrtidae
Main target pests	Coccidae (<i>Saissetia oleae</i> <i>Coccus hesperidum</i>)
Original distribution	South Africa (also established in Nearctic)
Distribution in EPPO	Greece, Italy
Date of first use	1992
EPPO countries where used	Austria, Belgium, Denmark, France, Germany, Greece, Israel, Italy, Netherlands, Spain, Sweden, Switzerland
Use	Indoors/outdoors

Metaphycus lounsburyi

Synonyms	<i>M. bartletti</i> , <i>M. anneckei</i> and <i>M. hagenowii</i> , also established in some Mediterranean countries, have been misidentified as <i>M. lounsburyi</i>
Family	Encyrtidae
Main target pests	Coccidae (<i>Saissetia oleae</i>)
Original distribution	California, Australia, Hawaii, South Africa
Distribution in EPPO	Mediterranean
Date of first use	1997
EPPO countries where used	Denmark, France, Italy, Netherlands
Use	Indoors/outdoors

Metaphycus swirskii

Family	Encyrtidae
Main target pests	Coccidae
Original distribution	East Africa?
Distribution in EPPO	France, Greece (Crete), Israel, Italy (probably more widely in Mediterranean region)
Date of first use	1992
EPPO countries where used	Belgium, France, Netherlands, Spain

Use	Indoors
<i>Microterys nietneri</i>	
Synonyms	<i>Microterys flavus</i>
Family	Encyrtidae
Main target pests	Coccidae (<i>Saissetia oleae</i>)
Original distribution	California, Pakistan
Distribution in EPPO	Italy
Date of first use	1987
EPPO countries where used	Belgium, Denmark, France, Germany, Greece, Israel, Netherlands, Spain, former-Yugoslavia
Use	Indoors/outdoors
<i>Opius pallipes</i>	
Family	Braconidae
Main target pests	<i>Liriomyza bryoniae</i>
Original distribution	Palearctic (?)
Distribution in EPPO	Widespread
Date of first use	1980
EPPO countries where used	Belgium, Czechia, Denmark, France, Germany, Greece, Guernsey, Jersey, Lithuania, Netherlands, Poland, Spain, UK
Use	Indoors
<i>Praon volucre</i>	
Synonym	<i>Aphidius volucre</i>
Family	Braconidae
Main target pests	Aphididae
Original distribution	Palearctic
Distribution in EPPO	Widespread
Date of first use	?
EPPO countries where used	Belgium, Guernsey, Jersey, Netherlands, UK
Use	Indoors

Scutellista caerulea

Synonym	<i>Scutellista cyanea</i>
Family	Pteromalidae
Main target pests	Coccidae (<i>Saissetia oleae</i> , <i>S. coffeae</i> , <i>Ceroplastes rusci</i>)
Original distribution	Africa
Distribution in EPPO	Mediterranean, CIS
Date of first use	1990
EPPO countries where used	Belgium, Denmark, France, Netherlands, Switzerland
Use	Indoors

Tetracnemoidea peregrina

Synonyms	<i>Hungariella peregrina</i>
Family	Encyrtidae
Main target pests	Pseudococcidae
Original distribution	North America
Distribution in EPPO	Israel
Date of first use	1992
EPPO countries where used	Belgium, France, Israel, Netherlands, Spain
Use	Indoors/outdoors

Tetracnemoidea brevicornis

Synonyms	<i>Hungariella pretiosa</i>
Family	Encyrtidae
Main target pests	Pseudococcidae
Original distribution	?
Distribution in EPPO	Italy
Date of first use	1992
EPPO countries where used	Belgium, France, Netherlands, Spain
Use	Indoors

Thripobius javae

Synonyms	<i>Thripobius semiluteus</i>
Family	Eulophidae
Main target pests	Thysanoptera (<i>Heliothrips</i> spp.)
Original distribution	Tropical and subtropical areas of Africa, Asia and Australia
Distribution in EPPO	Israel
Date of first use	1995
EPPO countries where used	Belgium, Denmark, France, Germany, Netherlands
Use	Indoors

Trichogramma brassicae

Synonyms	<i>Trichogramma maidis</i>
Family	Trichogrammatidae
Main target pests	Lepidoptera (<i>Ostrinia nubilalis</i>)
Original distribution	Europe
Distribution in EPPO	Widespread
Date of first use	1980
EPPO countries where used	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Italy, Jersey, Jordan, Netherlands, Slovakia, Spain, Switzerland, UK
Use	Outdoors/Indoors

Trichogramma cacoeciae

Family	Trichogrammatidae
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Main target pests	Lepidoptera
Original distribution	Europe
Distribution in EPPO	Widespread
Date of first use	1980
EPPO countries where used	Denmark, France, Germany, Hungary
Use	Outdoors

Trichogramma dendrolimi

Family	Trichogrammatidae
Main target pests	Lepidoptera
Original distribution	Europe
Distribution in EPPO	Widespread
Date of first use	1985
EPPO countries where used	Germany, Slovakia
Use	Outdoors

Trichogramma evanescens

Family	Trichogrammatidae
Main target pests	Lepidoptera (including on stored products)
Original distribution	Europe
Distribution in EPPO	Widespread
Date of first use	1993
EPPO countries where used	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Italy, Jersey, Jordan, Netherlands, Portugal, Slovakia, Spain, Tunisia, UK
Use	Indoors/outdoors

Trichogramma pintoi

Synonyms	<i>Trichogramma euproctidis</i>
Family	Trichogrammatidae
Original distribution	Palearctic, Near East, Nearctic, Neotropical region; Oriental region, widespread in EPPO region
Main target pests	Mainly Lepidoptera species: <i>Ostrinia nubilalis</i> , <i>Helicoverpa armigera</i> , <i>Cydia nigricana</i> , <i>Cydia pomonella</i> , <i>Cydia funebrana</i> , <i>Plutella xylostella</i> , <i>Mamestra brassicae</i> , <i>Lacanobia oleracea</i>
Date of first use	2002 (Hungary)
EPPO countries where used	Belarus, Czech Republic, Hungary, Moldova, Poland, Russia, Slovakia, Ukraine, Uzbekistan
Use	Outdoors/Indoors

Trichopria drosophilae

Family	Diapriidae
Original distribution	Worldwide, mainly in tropical/Mediterranean/warmer temperate climatic areas. Indigenous in the EPPO region
Distribution in EPPO	France, Germany, Greece, Israel, Italy, Morocco, the Netherlands, Spain.
Main target pests	Pupal parasitoid of <i>Drosophila suzukii</i> , relatively specific parasitoid compared to other parasitoids of Diptera.
Date of first use	2015 (Italy)
EPPO countries where used	Italy (by 2015), Spain (2017) and Switzerland (2017)
Use	Outdoors/Indoors

Insecta, Neuroptera

Chrysoperla carnea

Synonyms	<i>Chrysopa carnea</i>
Family	Chrysopidae
Main target pests	Aphididae etc.
Original distribution	Cosmopolitan
Distribution in EPPO	Widespread
Date of first use	1987
EPPO countries where used	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Ireland, Italy, Netherlands, Portugal, Spain, Sweden, Switzerland, UK
Use	Indoors/outdoors

Insecta, Thysanoptera

Franklinothrips megalops

Synonym	<i>Franklinothrips myrmicaeformis</i>
Family	Aeolothripidae
Main target pests	Thysanoptera
Original distribution	Africa, Israel, India
Distribution in EPPO	Israel, Tunisia
Date of first use	1992
EPPO countries where used	Belgium, France, Netherlands, Spain
Use	Indoors

Franklinothrips vespiformis

Family	Aeolothripidae
Main target pests	Thysanoptera
Original distribution	Asia
Distribution in EPPO	Israel, Portugal
Date of first use	1990
EPPO countries where used	Belgium, Denmark, France, Germany, Israel, Netherlands, Portugal, Sweden, Switzerland
Use	Indoors

Karnyothrips melaleucus

Family	Phlaeothripidae
Main target pests	Coccidae, Diaspididae (<i>Howardia biclavis</i>)
Original distribution	Pantropical
Distribution in EPPO	Portugal (Madeira)
Date of first use	1994
EPPO countries where used	Belgium, Denmark, France, Netherlands, Spain
Use	Indoors

Arachnida, Acarina

Amblydromalus limonicus

Synonyms	<i>Amblyseius limonicus</i> , <i>Typhlodromus (Amblyseius) limonicus</i> , <i>Amblyseius (Typhlodromalus) limonicus</i> , <i>Typhlodromus limonicus</i> , <i>Amblyseius (Amblyseius) limonicus</i> , <i>Typhlodromalus limonicus</i> , <i>Typhlodromalus lailae</i>
Family	Phytoseiidae
Main target pests	Thrips and whiteflies (mainly <i>Bemisia tabaci</i>)
Original distribution	North, Central and South America, Hawaii, New Zealand and Australia

Distribution in EPPO	Established in north-east Spain
Date of first use	2010
EPPO countries where used	Austria, Belgium, Denmark, England, Finland, France, Germany, Ireland, the Netherlands, Poland, Russia, Sweden and Ukraine
Use	Indoors / Outdoors
<i>Amblyseius andersoni</i>	
Synonyms	<i>Typhlodromus andersoni</i>
Family	Phytoseiidae
Main target pests	<i>Tetranychus urticae</i> , <i>T. cinnabarinus</i> , <i>Panonychus ulmi</i> , <i>Aculops lycopersicae</i> , <i>Polyphagotarsonemus latus</i> , <i>Phytonemus pallidus</i>
Original distribution	Palearctic and Nearctic
Distribution in EPPO	Widespread
Date of first use	2006 (by Syngenta)
EPPO countries where used	France, Guernsey, Italy, Netherlands, Poland, Spain, UK
Use	Indoors / Outdoors
<i>Amblyseius barkeri</i>	
Synonyms	<i>Amblyseius mckenziei</i> , <i>Neoseiulus barkeri</i>
Family	Phytoseiidae
Main target pests	Thysanoptera (<i>Thrips tabaci</i> , <i>Frankliniella occidentalis</i>), Tarsonemidae
Original distribution	Europe
Distribution in EPPO	Widespread
Date of first use	1981
EPPO countries where used	Austria, Belgium, Denmark, France, Germany, Italy, Netherlands, Slovakia, Switzerland
Use	Indoors
<i>Amblyseius degenerans</i>	
Synonym	<i>Iphiseius degenerans</i>
Family	Phytoseiidae
Main target pests	Thysanoptera
Original distribution	Africa/Mediterranean
Distribution in EPPO	Mediterranean
Date of first use	1993
EPPO countries where used	Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Jersey, Netherlands, Norway, Poland, Spain, Switzerland, Tunisia, Turkey, UK
Use	Indoors

Amblyseius swirskii

Synonym	<i>Typhlodromips swirskii</i>
Family	Phytoseiidae
Original distribution	East of Mediterranean region, naturally occurs in Israel, Italy, Cyprus, Greece and Egypt, found there in various crops like apples, apricot, citrus, vegetables and cotton
Main target pests	<i>Bemisia tabaci</i> , <i>Trialeurodes vaporariorum</i> , <i>Frankliniella occidentalis</i>
Date of first use	2005 (Austria, Belgium, Finland, France, Germany, Greece, Hungary, Italy, Morocco, Netherlands, Poland and Turkey)
EPPO countries where used	Austria, Belarus, Belgium, Denmark, Finland, France, Germany, Greece, Guernsey, Hungary, Italy, Jersey, Morocco, the Netherlands, Norway, Poland, Spain, Turkey, UK
Use	Indoors/outdoors

Cheyletus eruditus

Family	Cheyletidae
Main target pests	Storage mites, spider (foliage) mites
Original distribution	Indigenous
Distribution in EPPO	Belgium, Netherlands
Date of first use	1985
EPPO countries where used	Belgium, Czechia, France, Germany, Netherlands
Use	Indoors
Additional remarks	Cases of allergic reactions to farmers have been reported

Euseius gallicus

Family	Phytoseiidae
Main target pests	Whitefly (Aleyrodidae) and thrips (Thysanoptera)
Original distribution	Europe, Maritime and Mediterranean zones
Distribution in EPPO	Belgium, France, the Netherlands, Tunisia and Turkey
Date of first use	The Netherlands, 2010
EPPO countries where used	Belgium, France, Germany, the Netherlands, Poland and Ukraine
Use	Indoors

Hypoaspis aculeifer

Synonyms	<i>Geolaelaps aculeifer</i>
Family	Laelapidae
Main target pests	Sciaridae, <i>Rhizoglyphus echinopus</i>
Original distribution	Europe
Distribution in EPPO	Widespread
Date of first use	1995
EPPO countries where used	Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Spain, Switzerland, UK
Use	Indoors

Macrocheles robustulus

Synonyms	<i>Holostaspis subbadius</i> , <i>Macrocheles coprophila</i>
Family	Macrochelidae
Main target pests	Soil dwelling pests like thrips (pupae) and sciarids (larvae)
Original distribution	Cosmopolitan
Distribution in EPPO	Austria, Bulgaria, Czech Republic, Georgia, Germany, Greece, Hungary, Italy, Poland, Russia, Slovakia, Sweden and the UK
Date of first use	2010

EPPO countries where used	Austria, Belgium, Denmark, Finland, France, Germany, Italy, the Netherlands, Poland, Russia, Spain, Sweden, the UK and Ukraine
Use	Indoors

Metaseiulus occidentalis

Synonyms	<i>Galendromus occidentalis</i> , <i>Typhlodromus occidentalis</i>
Family	Phytoseiidae
Main target pests	Tetranychidae
Original distribution	Nearctic
Distribution in EPPO	?
Date of first use	1991
EPPO countries where used	Denmark, France, Greece, Guernsey, Jersey, Netherlands, Poland, Spain, UK
Use	Indoors/outdoors

***Neoseiulus californicus* (non-diapausing strain*)**

Synonyms	<i>Amblyseius californicus</i> , <i>Typhlodromus californicus</i> , <i>Amblyseius mungeri</i> , <i>Typhlodromus mungeri</i> , <i>Amblyseius chilensis</i> , <i>Typhlodromus marinus</i>
Family	Phytoseiidae
Main target pests	Tetranychidae
Original distribution	Southern N. America/California, Mediterranean
Distribution in EPPO	?
Date of first use	1985
EPPO countries where used	Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Ireland, Italy, Jersey, Malta, Netherlands, Poland, Portugal, Spain, Switzerland, Tunisia, UK (restricted under license)
Use	Indoors/outdoors

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Neoseiulus cucumeris

Synonym	<i>Amblyseius cucumeris</i>
Family	Phytoseiidae
Main target pests	Thysanoptera (<i>T. tabaci</i> , <i>F. occidentalis</i>)
Original distribution	Cosmopolitan
Distribution in EPPO	Widespread (not present in Sweden, Finland, Norway)
Date of first use	1985
EPPO countries where used	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Hungary, Ireland, Italy, Jersey, Jordan, Lithuania, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Tunisia, Turkey, UK
Use	Indoors/outdoors

Phytoseiulus persimilis

Synonyms	<i>Phytoseiulus riegeli</i> , <i>Phytoseiulus tardi</i>
Family	Phytoseiidae
Main target pests	Tetranychidae (<i>Tetranychus urticae</i>)

Original distribution	Mediterranean
Distribution in EPPO	Southern Europe
Date of first use	1968
EPPO countries where used	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Hungary, Ireland, Italy, Jersey, Jordan, Lithuania, Malta, Morocco, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Tunisia, Turkey, UK
Use	Indoors/outdoors

Stratiolaelaps scimitus

Synonyms	<i>Hypoaspis scimitus</i>
Taxonomic remark	The species has been previously used under the erroneous name <i>Stratiolaelaps miles</i> (= <i>Hypoaspis miles</i> = <i>Geolaelaps miles</i>)*
Family	Laelapidae
Main target pests	Sciaridae, <i>Rhizoglyphus echinopus</i>
Original distribution	Palearctic
Distribution in EPPO	Widespread
Date of first use	1994
EPPO countries where used	Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Jersey, Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland, UK
Use	Indoors

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Transeius montdorensis

Synonym	<i>Amblyseius montdorensis</i> , <i>Typhlodromips montdorensis</i>
Family	Phytoseiidae
Original distribution	Pacific Islands and western areas of the Australian mainland
Main target pests	Aleyrodidae (Trialeurodes spp. and Bemisia spp.), thrips (<i>Frankinella occidentalis</i> and <i>Thrips tabaci</i>) and Eriophyidae (<i>Aculops lycopersici</i>), although to be used principally against <i>Frankiniella occidentalis</i>
Date of first use	2004
EPPO countries where used	Belgium, Denmark, Finland, France, Germany, Greece, the Netherlands, Poland, Romania, Spain and UK
Use	Indoors/outdoors

Typhlodromus pyri

Family	Phytoseiidae
Main target pests	<i>Panonychus ulmi</i> , <i>Tetranychus urticae</i> , <i>Eriophyes vitis</i> , <i>Epitrimerus vitis</i>
Original distribution	Europe/Neartic
Distribution in EPPO	Widespread
Date of first use	1985
EPPO countries where used	Austria, Belgium, Czechia, Denmark, France, Germany, Hungary, Portugal, Slovakia
Use	Outdoors

Nematoda

Heterorhabditis bacteriophora

Synonyms	<i>Heterorhabditis heliothidis</i>
Family	Heterorhabditidae
Main target pests	Vine weevils (<i>Otiorhynchus</i> spp.)
Original distribution	South and central Europe/N. America
Distribution in EPPO	South and central Europe
Date of first use	1984
EPPO countries where used	Austria, Belgium, France, Germany, Italy, Netherlands, Slovenia, Switzerland
Use	Outdoors/?indoors

Heterorhabditis megidis

Family	Heterorhabditidae
Main target pests	Vine weevils (<i>Otiorhynchus</i> spp.)
Original distribution	Europe
Distribution in EPPO	Widespread
Date of first use	1984
EPPO countries where used	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Ireland, Italy, Jersey, Netherlands, Norway, Poland, Slovakia, Spain, Sweden, Switzerland, Tunisia, UK
Use	Indoors/outdoors

Phasmarhabditis hermaphrodita

Family	Phasmarhabditidae
Main target pests	Slugs
Original distribution	Central Europe
Distribution in EPPO	Widespread (except in Northern countries)
Date of first use	1984
EPPO countries where used	Belgium, Denmark, France, Germany, Guernsey, Italy, Jersey, Netherlands, UK
Use	Indoors/outdoors

Steinernema carpocapsae

Synonyms	<i>Neoplectana carpocapsae</i> , <i>N. feltiae</i>
Family	Steinernematidae
Main target pests	Vine weevils (<i>Otiorhynchus</i> spp.), Sciaridae, soil-borne insects
Original distribution	Europe (Holarctic)
Distribution in EPPO	Widespread
Date of first use	1984
EPPO countries where used	Belgium, Denmark, France, Germany, Guernsey, Italy, Jersey, Netherlands, Portugal, Slovenia, Sweden, UK
Use	Indoors/outdoors

Steinernema feltiae

Synonyms	<i>Neoplectana feltiae</i> , <i>N. bibionis</i> , <i>Steinernema bibionis</i> , <i>N. leucaniae</i>
Family	Steinernematidae
Main target pests	Melolonthidae, Sciaridae etc.
Original distribution	Europe (Holarctic)
Distribution in EPPO	Widespread
Date of first use	1984
EPPO countries where used	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Ireland, Italy, Jersey, Netherlands, Norway, Poland, Slovakia, Slovenia, Spain, Sweden, Switzerland, UK

Use	Indoors/outdoors
<i>Steinernema glaseri</i>	
Synonyms	<i>Neoplectana glaseri</i>
Family	Steinernematidae
Main target pests	Soil insects, especially Coleoptera including Chrysomelidae, Curculionidae, Elateridae, Scarabaeidae, some Lepidoptera, Orthoptera etc.
Original distribution	Argentina, Brazil, China, Czech Republic, Palestine, Portugal, Republic of Korea, Slovak Republic, Spain, Switzerland, the USA
Distribution in EPPO	Czech Republic, Portugal, Slovak Republic, Spain, Switzerland
Date of first use	2004
EPPO countries where used	Netherlands, Belgium
Use	Indoors/outdoors
<i>Steinernema kraussei</i>	
Family	Steinernematidae
Main target pests	<i>Otiorhynchus sulcatus</i>
Original distribution	Throughout Europe and North America
Distribution in EPPO	Widespread
Date of first use	2001 (in Ireland)
EPPO countries where used	Ireland, Norway, most of other European countries
Use	Indoors/outdoors

Appendix II: Successfully introduced classical biological control agents

Further details are given for each agent on its name, common synonyms, taxonomic classification, the pest(s) against which it has been used, date of first use, whether the agent was introduced as single or multiple introductions, and the origin of the collected material. Countries where the agent has been introduced for classical biological control in the EPPO region are listed. The presence of an agent on the list means that it has been used successfully in at least one of the countries mentioned. The result of the introduction is given, when available, as follows: [C] complete, [S] substantial, [P] partial, [E] established but not contributing to control or status unknown, [F] failed to become established; [N] no information on the outcome; [T] established but believed to have died out. Asterisks (*) indicate cases where more than one organism contributed to the result. Information on countries and result of introduction are given on the basis of information provided by the BIOCAT database of CABI (data from 1997 and 2000) and by some EPPO countries. Countries are, as far as possible, listed in the chronological order of introduction of the agent for classical biological control. The list of countries indicates to a certain degree the area in which each organism is present and established in the EPPO region, to the extent that each successful introduction can be presumed to have involved establishment. However, organisms may already be indigenous in some parts of the EPPO region, or have spread from countries where they were introduced, or indeed have disappeared from countries where they were once established, so the true distribution is uncertain in many cases. In some cases, a general statement can be made about present distribution in the EPPO region and this has been added in italics at the end of the list of countries.

INSECTA

Coleoptera

Adalia bipunctata

Cryptolaemus montrouzieri

Rhizophagus grandis

Rhyzobius forestieri

Rodolia cardinalis

Scymnus impexus

Scymnus reunioni

Serangium parcesetosum

Diptera

Cryptochetum iceryae

Hymenoptera

Ageniaspis citricola

Allotropa burrelli

Allotropa convexifrons

Amitus spiniferus

Anagyrus agraensis

Anagyrus fusciventris

Anaphes nitens

Aphelinus mali

Aphytis holoxanthus

Aphytis lepidosaphes

Aphytis lingnanensis

Aphytis melinus

Aphytis proclia

Clausenia purpurea

Comperiella bifasciata

Encarsia berlesei

Encarsia herndoni

Encarsia lahorensis

Encarsia perniciosi

Eretmocerus debachi

Metaphycus anneckeii

Metaphycus flavus

Metaphycus helvolus

Metaphycus lounsburyi

Metaphycus swirskii

Neodryinus typhlocybae

Neodusmetia sangwani

Ooencyrtus kuvanae

Pseudaphycus malinus

Psyllaephagus pilosus

Psytalia concolor

Pteroptrix orientalis

Pteroptrix smithi

Insecta, Coleoptera

Adalia bipunctata

Family	Coccinellidae
Target pest	<i>Toxoptera aurantii</i>
Date of first use	?
EPPO countries where introduced	Portugal (Azores) [S*] (<i>Widespread in the EPPO region</i>)
Multiple/single introductions	Single
Origin of collected material	Portugal

Cryptolaemus montrouzieri

Family	Coccinellidae
Target pest	Pseudococcidae
Date of first use	1929
EPPO countries where introduced	Portugal [S] (<i>Mediterranean distribution</i>)
Multiple/single introductions	Single
Origin of collected material	Australia
Target pest	<i>Planococcus citri</i>
Date of first use	1908-
EPPO countries where introduced	Italy [E; Sardegna P; Sicilia E], Israel [P], Portugal, Greece [F], Cyprus [T], France [P], Spain [P], former USSR (Georgia) [F?] (<i>Mediterranean distribution</i>)
Multiple/single introductions	Single, multiple
Origin of collected material	Australia

Rhizophagus grandis

Family	Rhizophagidae
Target pest	<i>Dendroctonus micans</i>
Date of first use	1963-
EPPO countries where introduced	former USSR (Georgia) [S], UK [E], France [E] (<i>Probably widespread in Central & Eastern Europe</i>)
Multiple/single introductions	Single, multiple
Origin of collected material	Belgium

Rhyzobius forestieri

Family	Coccinellidae
Target pest	<i>Saissetia oleae</i>
Date of first use	1980
EPPO countries where introduced	Italy [S], France [S], Greece [E], Cyprus [N], Israel [E]
Multiple/single introductions	Single
Origin of collected material	Australia

Rodolia cardinalis

Family	Coccinellidae
Target pest	<i>Icerya purchasi</i>
Date of first use	1897-
EPPO countries where introduced	Portugal [C], former USSR (Georgia) [C], Italy [S], former Yugoslavia [N], Israel [C*], France [C], Spain [C], Switzerland [F], Greece [S], Malta [C], Cyprus [S] (<i>Mediterranean distribution, CIS</i>)
Multiple/single introductions	Single, multiple
Origin of collected material	Australia

Scymnus impexus

Family	Coccinellidae
Target pests	<i>Adelges</i> spp.
Date of first use	1968

EPPO countries where introduced	Sweden [S], UK [N] (<i>native in Europe</i>)
Multiple/single introductions	Single
Origin of collected material	Germany
<i>Scymnus reunioni</i>	
Synonym	<i>Nephus reunioni</i>
Family	Coccinellidae
Target pest	<i>Planococcus citri</i>
Date of first use	1967
EPPO countries where introduced	Israel [N], Italy (Sardegna) [P], former USSR (Georgia) [F?]
Multiple/single introductions	Single
Origin of collected material	India
<i>Serangium parcesetosum</i>	
Family	Coccinellidae
Target pest	<i>Dialeurodes citri</i>
Date of first use	1973
EPPO countries where introduced	former USSR [Georgia, C*; Azerbaijan, C*; Uzbekistan, F], France (Corse) [E], Israel, Turkey [S?]
Multiple/single introductions	Single
Origin of collected material	India, former USSR

Insecta, Diptera

Cryptochetum iceryae

Family	Cryptochetidae
Target pest	<i>Icerya purchasi</i>
Date of first use	1987
EPPO countries where introduced	Israel [S]
Multiple/single introductions	Single
Origin of collected material	Australia

Insecta, Hymenoptera

Ageniaspis citricola

Family	Encyrtidae
Target pest	<i>Phyllocnistis citrella</i>
Date of first use	1994-
EPPO countries where introduced	Israel, Morocco, Algeria, Tunisia, France, Greece, Cyprus, Spain [C], Italy (Sicilia); established only on Canary Islands where provides complete control of the target pest
Multiple/single introductions	Single, multiple
Origin of collected material	Thailand, Florida (USA)

Allotropa burrelli

Family	Platygasteridae
Target pest	<i>Pseudococcus comstocki</i>
Date of first use	1945
EPPO countries where introduced	former USSR [P*]
Multiple/single introductions	Single
Origin of collected material	Japan

Allotropa convexifrons

Family	Platygasteridae
Target pest	<i>Pseudococcus comstocki</i>
Date of first use	1945
EPPO countries where introduced	former USSR [P*]
Multiple/single introductions	Single
Origin of collected material	Korea

Amitus spiniferus

Family	Platygasteridae
Target pest	<i>Aleurothrixus floccosus</i>
Date of first use	1971-
EPPO countries where introduced	France [C*], Italy [S*]
Multiple/single introductions	Single
Origin of collected material	Central America

Anagyrus agragensis

Family	Encyrtidae
Target pest	<i>Nipaecoccus viridis</i>
Date of first use	1984-
EPPO countries where introduced	Jordan [S?], Israel [S?]
Multiple/single introductions	Single
Origin of collected material	Guam

Anagyrus fusciventris

Family	Encyrtidae
Target pests	Pseudococcidae (<i>Pseudococcus longispinus</i>)
Date of first use	1972
EPPO countries where introduced	Israel [S]
Multiple/single introductions	Single
Origin of collected material	Australia

Anaphes nitens

Family	Mymaridae
Target pest	<i>Gonipterus scutellatus</i>
Date of first use	1978
EPPO countries where introduced	Italy [C], France [P], Spain [S]
Multiple/single introductions	Single
Origin of collected material	Australia

Aphelinus mali

Family	Aphelinidae
Target pest	<i>Eriosoma lanigerum</i>
Date of first use	1920-
EPPO countries where introduced	France [P], Hungary [S], Israel [P], Italy [S], Switzerland [S], former USSR (Azerbaijan) [C], Portugal [N], Belgium [C], Germany [P], UK [P], Slovenia, Malta, Netherlands [P], Spain [P], Poland [P], Sweden [P], Cyprus [C], Denmark [P] (<i>Widespread in the EPPO region</i>)
Multiple/single introductions	Single
Origin of collected material	USA

Aphytis holoxanthus

Family	Aphelinidae
Target pest	<i>Chrysomphalus aonidum</i>
Date of first use	1956
EPPO countries where introduced	Israel [C*] (<i>Mediterranean distribution</i>)

Multiple/single introductions	Single
Origin of collected material	Hong Kong
<i>Aphytis lepidosaphes</i>	
Family	Aphelinidae
Target pest	<i>Cornuaspis beckii</i>
Date of first use	1956-
EPPO countries where introduced	Israel [C], Cyprus [N], France [N], Greece [S], Spain [S], Italy (Sicilia) [P]
Multiple/single introductions	Single
Origin of collected material	China
<i>Aphytis lingnanensis</i>	
Family	Aphelinidae
Target pest	<i>Aonidiella aurantii</i>
Date of first use	1960-
EPPO countries where introduced	Cyprus [P], Israel [E], Italy (Sicilia), Morocco [E], Spain [P] (<i>Mediterranean distribution</i>)
Multiple/single introductions	Single
Origin of collected material	China
<i>Aphytis melinus</i>	
Family	Aphelinidae
Target pest	<i>Chrysomphalus dictyospermi</i>
Date of first use	1962-
EPPO countries where introduced	Greece [S; Kriti, C], Italy [C], Morocco [C], France (Corse) [P], Spain [P] (<i>commercially available for inundative releases since 2008</i>), former USSR (Georgia) [E?] (<i>Mediterranean distribution</i>)
Multiple/single introductions	?
Origin of collected material	India/Pakistan
Target pest	<i>Aonidiella aurantii</i>
Date of first use	1961-
EPPO countries where introduced	Cyprus [P], Israel [P], Italy (Sicilia) [P], Morocco [E] (<i>Mediterranean distribution</i>)
Multiple/single introductions	Single, multiple
Origin of collected material	India/Pakistan
Target pest	<i>Aspidiotus nerii</i>
Date of first use	?
EPPO countries where introduced	Greece (Kriti) [P] (<i>Mediterranean distribution</i>)
Multiple/single introductions	Single
Origin of collected material	India/Pakistan
<i>Aphytis proclia</i>	
Family	Aphelinidae
Target pest	<i>Pseudaulacaspis pentagona</i>
Date of first use	1924
EPPO countries where introduced	Italy [S] (<i>Widespread in the EPPO region</i>)
Multiple/single introductions	Single
Origin of collected material	East Asia
<i>Clausenia purpurea</i>	
Family	Encyrtidae
Target pest	<i>Pseudococcus citriculus</i>
Date of first use	1940
EPPO countries where introduced	Israel [C]

Multiple/single introductions	Single
Origin of collected material	Japan
<i>Comperiella bifasciata</i>	
Family	Encyrtidae
Target pest	<i>Aonidiella aurantii</i>
Date of first use	1924-
EPPO countries where introduced	Israel [P*], Italy, France [N], Spain [P] (<i>Mediterranean distribution</i>)
Multiple/single introductions	Single
Origin of collected material	South China
<i>Encarsia berlesei</i>	
Family	Aphelinidae
Target pest	<i>Pseudaulacaspis pentagona</i>
Date of first use	1906-
EPPO countries where introduced	Italy [C], Bulgaria [C], Switzerland [C], Spain [C], Austria [C], former USSR [C], France [P], Hungary, Slovenia
Multiple/single introductions	Single
Origin of collected material	Japan, East Asia
<i>Encarsia herndoni</i>	
Synonym	<i>Encarsia elongata</i>
Family	Aphelinidae
Target pest	<i>Lepidosaphes gloverii</i>
Date of first use	1979
EPPO countries where introduced	Spain [S]
Multiple/single introductions	Single
Origin of collected material	East Asia
<i>Encarsia lahorensis</i>	
Family	Aphelinidae
Target pest	<i>Dialeurodes citri</i>
Date of first use	1973-
EPPO countries where introduced	Italy [S; Sardegna, P; Sicilia, C], former USSR (Georgia) [C*], France [E], Turkey, Greece [S, E], Israel [C*]
Multiple/single introductions	Single, multiple
Origin of collected material	India, Pakistan
<i>Encarsia perniciosi</i>	
Family	Aphelinidae
Target pest	<i>Quadraspidiotus perniciosus</i>
Date of first use	1932-
EPPO countries where introduced	Italy [P], former USSR [E], Germany [P], France [P], Bulgaria [C], former Czechoslovakia [E, N], Switzerland [P], former Yugoslavia [N], Austria [E], Greece [E], Spain [P] (<i>Widespread in the EPPO region</i>)
Multiple/single introductions	Single, multiple
Origin of collected material	China, Korea
<i>Eretmocerus debachi</i>	
Family	Aphelinidae
Target pest	<i>Parabemisia myricae</i>
Date of first use	1982-
EPPO countries where introduced	Israel [C], Turkey [C], Italy [S] (<i>Mediterranean distribution?</i>)
Multiple/single introductions	Single
Origin of collected material	Japan, North America

Metaphycus anneckeii

Family	Encyrtidae
Target pest	Saissetia oleae
Date of first use	?
EPPO countries where introduced	Greece [C], Israel [E], France [E], Italy [F]
Multiple/single introductions	Single
Origin of collected material	South Africa

Metaphycus flavus

Family	Encyrtidae
Target pest	Coccus hesperidum
Date of first use	1959
EPPO countries where introduced	Italy [P], former USSR (Ukraine) [C] (<i>Mediterranean distribution</i>)
Multiple/single introductions	Single
Origin of collected material	Morocco

Metaphycus helvolus

Family	Encyrtidae
Target pest	Saissetia oleae
Date of first use	1960-
EPPO countries where introduced	Israel [E], France (Corse) [P*], Greece [C; Kriti, S], Italy [P], Spain [S], Cyprus [E], former USSR [F]
Multiple/single introductions	Single
Origin of collected material	South Africa

Metaphycus lounsburyi

Family	Encyrtidae
Target pest(s)	Saissetia oleae
Date of first use	1973-
EPPO countries where introduced	France [P], Israel [C], Greece (Kriti) [P], Italy [E], Cyprus [S] (<i>Mediterranean distribution</i>)
Multiple/single introductions	Single
Origin of collected material	South Africa

Metaphycus swirskii

Family	Encyrtidae
Target pest	Saissetia oleae
Date of first use	1973
EPPO countries where introduced	Israel [E], France [E], Greece (Kriti) [P], Italy [P]
Multiple/single introductions	Single
Origin of collected material	Kenya

Neodryinus typhlocybae

Family	Dryinidae
Target pest	Metcalfa pruinosa
Date of first use	1989-
EPPO countries where introduced	Italy, France, Slovenia, Switzerland
Multiple/single introductions	Single
Origin of collected material	USA

Neodusmetia sangwani

Family	Encyrtidae
Target pest	Antonina graminis
Date of first use	1971
EPPO countries where introduced	Israel [S]
Multiple/single introductions	Single

Origin of collected material	South India
<i>Ooencyrtus kuvanae</i>	
Family	Encyrtidae
Target pest	Lymantria dispar
Date of first use	1922
EPPO countries where introduced	former Czechoslovakia [E], Spain [P], Morocco [E], Algeria [E], Portugal [E], former USSR (Kazakhstan, Moldova, Russia, Ukraine, Uzbekistan) [P]
Multiple/single introductions	Single
Origin of collected material	Japan

Pseudaphycus malinus

Family	Encyrtidae
Target pest	Pseudococcus comstocki
Date of first use	1945
EPPO countries where introduced	former USSR [C]
Multiple/single introductions	Single
Origin of collected material	Korea

Psyllaephagus pilosus

Family	Encyrtidae
Target pest	Ctenarytaina eucalypti
Date of first use	1994
EPPO countries where introduced	Ireland [S], France [S]
Multiple/single introductions	Single
Origin of collected material	Australia

Psytalia concolor

Synonym	Opius concolor
Family	Braconidae
Target pest	Bactrocera oleae
Date of first use	1914-
EPPO countries where introduced	Italy [S], Greece [P], France [P], Spain [P], Portugal, former Yugoslavia [N]
Multiple/single introductions	Single
Origin of collected material	Libya, Tunisia

Pteroptrix orientalis

Synonym	Archenomus orientalis
Family	Aphelinidae
Target pest	Pseudaulacaspis pentagona
Date of first use	1909
EPPO countries where introduced	Italy [S]
Multiple/single introductions	Single
Origin of collected material	Japan

Pteroptrix smithi

Family	Aphelinidae
Target pest	Chrysomphalus aonidum
Date of first use	1956
EPPO countries where introduced	Israel [C*]
Multiple/single introductions	Single
Origin of collected material	Hong Kong

Result of introduction when available: [C] complete, [S] substantial, [P] partial, [E] established but not contributing to control or status unknown, [F] failed to become established; [N] no information on the outcome; [T] established but believed to have died out. Asterisks (*) indicate cases where more than one organism contributed to the result.

Appendix III: List of biological control agents formerly recommended by EPPO

Species which appear on this list were listed in Appendix I or II but have been removed. These species are not necessarily unsafe. Rather, they no longer fulfil all of the criteria to remain on the list. The reasons for removal from Appendix I or II are provided. Evidence for removal relating to non-target or other adverse effects in one or more countries in the EPPO region are referenced.

Formerly recommended as commercially used biological control agents

Insecta
Hymenoptera
- *Cales noacki*
- *Lysiphlebus testaceipes*

Formerly recommended as successfully introduced classical biological control agents

Insecta
Coleoptera
- *Harmonia axyridis*
Hymenoptera
- *Cales noacki*
- *Lysiphlebus testaceipes*

Insecta: Hymenoptera

Cales noacki

Family	Aphelinidae
Main target pest	<i>Aleurothrixus floccosus</i>
Date of first use	1970
EPPO countries where introduced	Spain [S], France [C], Italy [S], Morocco [C], Portugal [E], Tunisia [C], Malta, Greece (<i>Mediterranean distribution</i>)
Multiple/single introductions	Single, multiple
Origin of collected material	Chile
Date of removal from the list	2009-03-25/26, Joint EPPO/IOBC Meeting on Biological Control Agents, Engelberg (CH)
Summary of reasons	Commercial releases may lead to establishment in non-target habitats in certain areas. Outdoor releases have shown a wide host range that extends beyond the order Hemiptera and in some areas out competes indigenous natural enemies.

Lysiphlebus testaceipes

Family	Braconidae
Main target pest	Aphididae (<i>Aphis gossypii</i>)
Original distribution	Nearctic, USA
Distribution in EPPO	Mediterranean countries (and possibly others)
Date of first use	1990
EPPO countries where used	Denmark, Germany (DE), Italy, Spain
Use	Indoors
Date of removal from the list	2008-03-26/28, Joint EPPO/IOBC Meeting on Biological Control Agents Wageningen (NL)
Summary of reasons	The species has a wide host range and shown non-target effects. In some areas it has spread into non-target habitats, where it has attacked non-target host species and replaced native primary parasitoid species (see references). Lumbierres B., Starý P., Pons X., 2007. Seasonal parasitism of cereal aphids in a Mediterranean arable crop system. <i>Journal of Pest Science</i> , 80: 125-130. Pons X., Lumbierres B., Starý P., 2004. Expansión de <i>Lysiphlebus testaceipes</i> (Cresson) (Hym., Braconidae, Aphidiinae) en el Noreste de

la Península Ibérica. Boletín de Sanidad Vegetal. Plagas, 30: 547-552.

Stary P., Lumbierres B., Pons, X., 2004. Opportunistic changes in the host range of *Lysiphlebus testaceipes* (Cr.), an exotic aphid parasitoid expanding in the Iberian Peninsula. Journal of Pest Science, 77: 139-144.

Insecta: Coleoptera

Harmonia axyridis

Family	Coccinellidae
Main target pest	<i>Toxoptera aurantii</i>
Date of first use	1964
EPPO countries where introduced	Portugal (Azores) [S*], Greece, former USSR [N], Ukraine, Tunisia, Italy
Multiple/single introductions	Single
Origin of collected material	East Asia
Date of removal from the list	2009-03-25/26, Joint EPPO/IOBC Meeting on Biological Control Agents, Engelberg (CH)
Summary of reasons	The species has a wide host range across many taxonomic groups with a strong capacity for natural spread. The species has become established in large areas of the EPPO region and is known to attack non-target prey, including some beneficial species. Based on releases elsewhere, replacement of native coccinellid species in the EPPO region could be expected.

Insecta: Hymenoptera

Cales noacki

Family	Aphelinidae
Main target pest	<i>Aleurothrixus floccosus</i>
Date of first use	1970
EPPO countries where introduced	Spain [S], France [C], Italy [S], Morocco [C], Portugal [E], Tunisia [C], Malta, Greece (<i>Mediterranean distribution</i>)
Multiple/single introductions	Single, multiple
Origin of collected material	Chile
Date of removal from the list	2009-03-25/26, Joint EPPO/IOBC Meeting on Biological Control Agents, Engelberg (CH)
Summary of reasons	Commercial releases may lead to establishment in non-target habitats in certain areas. Outdoor releases have shown a wide host range that extends beyond the order Hemiptera and in some areas out competes indigenous natural enemies.

Lysiphlebus testaceipes

Family	Braconidae
Target pest	<i>Aphis citricola</i>
Date of first use	1973
EPPO countries where introduced	former Czechoslovakia, France (Corse) [P], Morocco [N] (<i>Mediterranean countries and possibly others</i>)
Multiple/single introductions	Single, multiple
Origin of collected material	USA
Target pest	<i>Toxoptera aurantii</i>
Date of first use	1973
EPPO countries where introduced	France [S, P], Spain [P], Italy [E], Morocco [N] (<i>Mediterranean</i>)

	<i>countries and possibly others)</i>
Multiple/single introductions	Single, multiple
Origin of collected material	USA
Date of removal from the list	2008-03-26/28, Joint EPPO/IOBC Meeting on Biological Control Agents Wageningen (NL)
Summary of reasons	<p>The species has a wide host range and shown non-target effects. In some areas it has spread into non-target habitats, where it has attacked non-target host species and replaced native primary parasitoid species (see references).</p> <p>Lumbierres B., Starý P., Pons X., 2007. Seasonal parasitism of cereal aphids in a Mediterranean arable crop system. <i>Journal of Pest Science</i>, 80: 125-130.</p> <p>Pons X., Lumbierres B., Starý P., 2004. Expansión de <i>Lysiphlebus testaceipes</i> (Cresson) (Hym., Braconidae, Aphidiinae) en el Noreste de la Península Ibérica. <i>Boletín de Sanidad Vegetal. Plagas</i>, 30: 547-552.</p> <p>Starý P., Lumbierres B., Pons, X., 2004. Opportunistic changes in the host range of <i>Lysiphlebus testaceipes</i> (Cr.), an exotic aphid parasitoid expanding in the Iberian Peninsula. <i>Journal of Pest Science</i>, 77: 139-144.</p>

Result of introduction when available: [C] complete, [S] substantial, [P] partial, [E] established but not contributing to control or status unknown, [F] failed to become established; [N] no information on the outcome; [T] established but believed to have died out. Asterisks (*) indicate cases where more than one organism contributed to the result.