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CONTENTS ***Pests & Diseases***

Invasive Plants

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2014/001 First report of *Geosmithia morbida* and its insect vector (*Pityophthorus juglandis)* causing thousand cankers disease in Italy

In the USA, the association of a recently described fungal species, *Geosmithia morbida,* and its vector, *Pityophthorus juglandis* (Coleoptera: Scolytidae - walnut twig beetle), is causing a severe and emerging disease of black walnut (*Juglans nigra*) and other *Juglans* species or hybrids. This disease is called thousand cankers disease and, until recently it had not been reported from any other parts of the world. At the end of November 2013, the NPPO of Italy informed the EPPO Secretariat of the first records of *G. morbida* and *P. juglandis* on its territory. Both pests were found in the municipality of Bressanvido (province of Vicenza, Veneto region) on a small number of *J. nigra* trees, and their identity was confirmed by laboratory analysis (morphology, molecular tests) on 2013-09-27. The infected trees (approximately 15 years old) were part of a plantation grown for wood production. Leaf yellowing and wilting, twig and branch dieback were observed, as well as numerous small bark cankers developing around galleries made by *P. juglandis*. This outbreak was discovered because the owner of the plantation had contacted Prof. Montecchio at the University of Padova where the identification was performed. In a paper to be published, Montecchio & Faccoli (2014) explain that the disease was also detected in Bressanvido on 80-year old *J. nigra* trees in a private garden. The origin of this outbreak is unknown. The most likely pathway is thought to be the introduction of the insect vector on wood (with bark) from the USA. The discovery of thousand cankers disease is considered by the NPPO as a serious threat to *J. nigra*, and possibly to *J. regia* which is susceptible to the disease, although apparently to a much lesser degree, in the USA. It is noted that during the last 90 years, numerous areas along the Po valley have been reforested with mixed tree species for wood production, in which *J. nigra* is often present in varying proportions. Systematic surveys will be conducted near the outbreak site to determine the extent of the infection. Random checks will also be carried out in *J. nigra* plantations across the Veneto region. Studies will be conducted on the potential pathways of entry of this new disease, in particular in sawmills where walnut wood is imported from the USA. Phytosanitary measures to eradicate the disease are being considered.
The pest status of both *Geosmithia morbida* and *Pityophthorus juglandis* in Italy is officially declared as[1]: **Outbreak found in one locality in Veneto region, monitoring surveys and eradication measures are being adopted.**

Source: Montecchio L, Faccoli M (2014) First record of thousand cankers disease *Geosmithia morbida* and walnut twig beetle *Pityophthorus juglandis* on *Juglans nigra* in Europe. *Plant Disease* **98**(in press).

NPPO of Italy (2013-11).

Additional key words: new record **Computer codes:** GEOHMO, PITOJU, IT

[1] Translated from the Italian: 'Focolaio rinvenuto in una località della Regione Veneto, attività di monitoraggio e misure di eradicazione in corso di adozione'.

2014/002 Addition of *Geosmithia morbida* and its insect vector (*Pityophthorus juglandis)* causing thousand cankers disease to the EPPO Alert List

Because of the recent detection of *Geosmithia morbida* and its insect vector (*Pityophthorus juglandis)* causing thousand cankers disease on *Juglans nigra* in Italy, the EPPO Secretariat decided to add this new disease to the EPPO Alert List.

Thousand cankers disease (*Geosmithia morbida* and *Pityophthorus juglandis*)

Why — In the USA, widespread branch dieback and mortality of *Juglans nigra* (black walnut) has been occurring since the mid-1990s. In 2008, this mortality was determined to be the result of a combination of feeding damage by *Pityophthorus juglandis* (Coleoptera: Scolytidae - walnut twig beetle), and subsequent canker development around beetle galleries caused by a newly described fungal symbiont of the beetle, *Geosmithia morbida*. As the number of cankers formed on branches and trunks is very high, the disease has been called thousand cankers. In the USA, this disease is now widespread in the Western states causing extensive tree mortality on *J. nigra* (and to a lesser extent on some other *Juglans* species), and has also established in several states in the Eastern part of the USA where *J. nigra* is a native species. At the end of 2013, thousand cankers disease was reported for the first time in Italy on a small number of *J. nigra* trees. Considering the risk that this disease may present for walnut trees (*Juglans* spp.) which are widely grown in the EPPO region, the Secretariat decided to add *G. morbida* and its vector, *P. juglandis,* to the EPPO Alert List.

Where — Until its recent introduction into Italy, thousand cankers disease was only recorded in the USA. *G. morbida* is a recently described fungal species and it is not known whether it is native to North America. The vector, *P. juglandis*, is considered to be native from Western USA, but its spread to Eastern USA probably started a few decades ago. The distribution below is given for the pathogen. The distribution of the insect vector, *P. juglandis*, is the same with the addition of Mexico (in this country, *P. juglandis* is reported to occur but not *G. morbida*).

EPPO region: Italy (Veneto region). In September 2013, both *G. morbida* and *P. juglandis* were detected on *J. nigra* trees of different ages (80-years old trees in a garden, and 15-years old trees in a nearby walnut plantation for timber production). Under eradication.

North America: Mexico (insect vector but not *G. morbida*), USA (Arizona, California, Colorado, Idaho, Nevada, New Mexico, North Carolina, Ohio, Oregon, Pennsylvania, Tennessee, Utah, Virginia, Washington).

On which plants — *Juglans nigra* (black walnut) is the most severely affected host plant in the USA. The disease has also been observed on *J. californica* (Southern California black walnut), *J. hindsii* (Northern California black walnut), *Juglans* hybrids (e.g. *J. hindsii x J. regia*), and occasionally on *J. cinerea* (butternut). On *J. major* (Arizona walnut), *G. morbida* causes small, superficial cankers but no extensive dieback. Finally, *J. regia* (English walnut) has exhibited symptoms only in rare cases. Susceptibility studies carried out in the USA have shown that all tested walnut species (*J. ailantifolia, J. californica, J. cinerea, J. hindsii, J. major, J. mandshurica, J. microcarpa, J. nigra, J. regia*) were susceptible but at different levels. In these experiments, *J. nigra* was the most susceptible species, and results obtained for other *Juglans* spp. corroborated many of the field observations made so far in the USA. In these experiments, inoculated *J. regia* developed cankers but susceptibility varied between experiments.

Historically, *P. juglandis* was mainly reported on *J. major* in Arizona and New Mexico where it was considered as a minor pest. Observations in Arizona and New Mexico suggested that *P. juglandis* restricts its damage primarily to shaded or weakened branches and twigs in the upper crown. However, the expansion of the beetle's range to *J. regia* planted in urban landscapes in the Western USA (i.e.

outside the native range of *J. regia*) appears to have taken place during the last 20 years. On *J. nigra*, the beetle activity seems to be more aggressive than on native Western American walnuts (e.g. *J. major*).

Damage

Affected trees initially exhibit yellowing and wilting of the foliage followed by progressive branch dieback and crown thinning. Close examination of the bark surface shows pin-hole sized entrance and exit holes of *P. juglandis* adults. Dark wet cankers are often found near these holes. When removing the bark of the cankered areas, several beetle feeding or reproductive galleries, as well as areas of necrotic phloem tissue can be observed. As the beetle and pathogen spread, new cankers form and coalesce, girdling branches. As the upper branches die, the crown of the tree also dies and the tree often re-sprout branches from the trunk. Cankers caused by *G. morbida* are small, but repeated feeding and egg laying by *P. juglandis* beetles on the same tree result in the production of a very high number of cankers (hence the name of the disease) which girdle and kill branches, and ultimately the whole tree. Trees can be killed within 3-4 years of the onset of symptoms.

Adult beetles of *P. juglandis* are small (1.8-2 mm long), reddish-brown in colour. In California, *P. juglandis* has 2 to 3 generations per year. Adults emerge for an initial flight period in April/May followed by a longer second generation flight period from mid-July to mid-September. After flying, male beetles initiate brood galleries on branches often near leaf scars or lenticels. Males produce a pheromone and attract 2 to 3 females which then attract additional beetles to the tree. Females lay eggs in horizontal galleries (across the grain) that are constructed in the phloem and xylem. Small, white, C-shaped larvae hatch and create feeding mines that extend from the egg galleries (usually vertically, along the grain). These galleries are contained in the phloem and filled with dark brown to black boring dust. Larvae complete their development inside the galleries and pupate within a single pupal chamber. Adults emerge and either remain on the same tree or fly to other trees to mate and reproduce. It is thought that beetles inoculate *G. morbida* into the phloem during the construction of feeding or reproductive galleries. Dead tissue is limited to the phloem and cambium and the fungus does not penetrate woody tissues and does not infect the tree systemically.

Extensive tree mortality has been observed in the USA, mainly on *J. nigra* trees planted in urban environments, and is the result of the combined action of the two organisms. The insect or the fungus alone are not considered to be able to provoke tree mortality.

Transmission

Thousand cankers disease appears to be exclusively transmitted by *P. juglandis*. In the natural environment, although *G. morbida* produces large number of conidia that could be airborne, there is no direct evidence that infection occurs anywhere on trees except at *P. juglandis* feeding sites or inside/around galleries. In the literature, it is recorded that *P. juglandis* can fly over distances of 1 to 2 miles (1.6 to 3.2 km). Over longer distances, the disease can be spread by the movement of wood, including logs, sawn wood, firewood, wood chips and wood packaging material. Movement of infested plants for planting can also spread the disease. As *P. juglandis* is reported to be often found on branches with diameters as small as 1 cm, the movement of young nursery plants may be a pathway. Nuts are not considered as a potential pathway, as the fungus does not colonize trees in a systemic way and beetles do not feed on them.

Pathway

Wood and bark (including logs, firewood, sawn wood), wood chips, wood packaging material, plants for planting of *Juglans* spp. from the USA.

Possible risks

In the EPPO region, the most widely grown *Juglans* species is *J. regia* which has long been cultivated for nut production, amenity purposes and wood production. However, its susceptibility to thousand cankers disease remains to be further studied. The most susceptible species, *J. nigra* has been introduced during the 17th Century into the EPPO region, first for amenity purposes and later for the production of high quality wood. More data is needed on its distribution and economic importance. The introduction of both *P. juglandis* and *G. morbida* into

Italy clearly shows that introduction pathways of thousand cankers disease into the EPPO region exist. In addition, this disease probably has the potential to establish and spread if no measures are taken. In the USA, extensive mortality has been observed on *J. nigra* and phytosanitary measures have been taken to protect US states which are still free from the disease (e.g. restrictions on the movement of walnut wood and plants for planting). To prevent spread, infected trees are removed and material is immediately destroyed by grinding or burning. No control methods (chemical, cultural, resistant varieties) are currently available. The introduction of thousand cankers disease clearly represents a threat to the cultivation of *Juglans* species, and it is desirable that measures are taken to prevent any further spread.

Sources

Fisher JR, McCann DP, Taylor NJ (2013) *Geosmithia morbida*, thousand cankers disease of black walnut pathogen, was found for the first time in Southwestern Ohio. Plant Health Progress. https://www.plantmanagementnetwork.org/php/elements/sum2.aspx?id=10736

Grant GF, Windham MT, Haun WG, Wiggins GJ, Lambdin PL (2011) Initial assessment of thousand cankers disease on black walnut, *Juglans nigra*, in Eastern Tennessee. *Forests* **2**, 741-748.

INTERNET

University of California Agriculture & Natural Resources. Thousand cankers disease and the walnut twig beetle in California (dated May 2010). http://www.ipm.ucdavis.edu/EXOTIC/thousandcankers.html#

USDA - Forest Service Northeastern Area. Pest Alert. Thousand cankers disease (dated February 2013) http://www.thousandcankers.com/media/docs/USDA_TCD_Factsheet_2_2013.pdf

Kolařík M, Freeland E, Utley C, Tisserat N (2011) *Geosmithia morbida* sp. nov., a new phytopathogenic species living in symbiosis with the walnut twig beetle (*Pityophthorus juglandis*) on *Juglans* in USA. *Mycologia* **103**(2), 325-332.

Moltzan BD **(**2011) National response framework for thousand cankers disease (TCD) on walnut. United States Department of Agriculture. Forest Service, Animal Plant Health Inspection Service, National Association of State Foresters, and the National Plant Board, 17 pp. http://www.fs.fed.us/foresthealth/docs/TCD_National_Framework.pdf

Montecchio L, Faccoli M (2013) First record of thousand cankers disease *Geosmithia morbida* and walnut twig beetle *Pityophthorus juglandis* on *Juglans nigra* in Europe. *Plant Disease* **98**(in press).

Newton LP, Fowler G, Neeley AD, Schall RA, Takeuchi Y (2009) Pathway assessment: *Geosmithia* sp. and *Pityopthorus juglandis* Blackman movement from the western into the eastern United States. USDA-APHIS, 50 pp. http://tn.gov/agriculture/publications/regulatory/tc_pathwayanalysis.pdf

NPPO of Italy (2013-11).

Serdani M, Vlach JJ, Wallis KL, Zerillo M, McCleary T, Romero-Severson J, Tisserat NA (2013) First report of *Geosmithia morbida* and *Pityophthorus juglandis* causing thousand cankers disease in butternut. *Plant Health Progress* https://www.plantmanagementnetwork.org/php/elements/sum.aspx?id=10708&photo=6106

Seybold SJ, Coleman TW, Dallara PL, Dart NL, Graves AD, Pederson LA, Spichiger SE (2012) Recent collecting reveals new state records and geographic extremes in the distribution of the walnut twig beetle, *Pityophthorus juglandis* Blackman (Coleoptera: Scolytidae), in the United States. *Pan-Pacific Entomologist* **88**(2), 277-280.

Tisserat N, Cranshaw W, Putnam ML, Pscheidt, Leslie CA, Murray M, Hoffman J, Barkley Y, Alexander K, Seybold SJ (2011) Thousand cankers disease is widespread in black walnut in the Western United States Plant Health Progress. http://www.fs.fed.us/psw/publications/seybold/psw_2010_seybold008(tisserat).pdf

Utley C, Nguyen T, Roubtsova T, Coggeshall M, Ford TM, Grauke LJ, Graves AD, Leslie CA, McKenna J, Woeste K, Yaghmour MA, Cranshaw W, Seybold SJ, Bostock RM, Tisserat N (2013) Susceptibility of walnut and hickory species to *Geosmithia morbida*. *Plant Disease* **97**(5), 601-607.

EPPO RS 2014/002
Panel review date - Entry date 2014-01

2014/003 First report of *Erwinia amylovora* in Ukraine

In Ukraine, the first outbreaks of *Erwinia amylovora* (EPPO A2 List) were detected in 2007 in the Zakarpattia and Chernivtsi regions (total area of 45.9 ha). In 2011, fireblight was also observed in the Vinnytsa, Lviv and Rivne regions in an area of 61 ha.
The situation of *Erwinia amylovora* in Ukraine can be described as follows: **Present, under official control.**

Source: Fedorenko V, Pylypenko L (2012) Quarantine and invasive species in Ukraine. *Progress in Plant Protection* **52**(4), 1156-1164.

Additional key words: new record **Computer codes:** ERWIAM, UA

2014/004 First report of *Erwinia amylovora* in Estonia

In Estonia, an outbreak of *Erwinia amylovora* (EPPO A2 List) was detected for the first time in May 2012 on a *Pyrus communis* tree located in a private garden, in the county of Viljandi. A survey subsequently detected the bacterium in 5 additional samples which had been collected from a nursery (2 samples), an orchard (1 sample), and private gardens (2 samples). Eradication measures were taken, all infected plants and potential host plants located in their vicinity were destroyed (i.e. approximately 37 000 plants in the nursery, all host trees of the 15 ha orchard). All outbreak sites from 2012 are being kept under close surveillance but no new outbreaks were detected in 2013.
The situation of *Erwinia amylovora* in Estonia can be described as follows: **Present, first found in 2012 in a small number of samples, under eradication.**

Source: Presentation made at the EPPO Council Colloquium on contingency planning (Bykovo, RU, 2013-09-19). http://archives.eppo.int/MEETINGS/2013_conferences/council_colloquium.htm

Estonian Agricultural Board. Plant Health Department. Press release of 2012-07-17 (in Estonian). http://www.pma.agri.ee/index.php?id=95&y=2012&nID=73

Additional key words: new record **Computer codes:** ERWIAM, EE

2014/005 Update on the situation of *Blueberry scorch virus* in the Netherlands

In the Netherlands, *Blueberry scorch virus* (*Carlavirus*, BlScV – EPPO A2 List) was first reported in November 2008 (see EPPO RS 2008/204). During a specific survey, BlScV was detected in 1 *Vaccinium corymbosum* plant which was subsequently destroyed. Since that time, annual surveys have been carried out and a PRA was completed in October 2012. At the beginning of 2013, BlScV was detected in 1 plant grown in another company. As the source of this infection could not be linked to a recent introduction, it was assumed that BlScV has been present in the Netherlands for some time, although at a low level. Based on the conclusions of the Dutch PRA, the NPPO decided that certification programmes were more appropriate than phytosanitary regulations to control this virus. A certification system for the production of healthy planting material of *V. corymbosum* has been set up by Naktuinbouw in the Netherlands. This certification system includes a zero tolerance for BlScV, as well as for a number of other viruses infecting *V. corymbosum*.

The pest status of *Blueberry scorch virus* in the Netherlands is officially declared as: **Present, few occurrences.**

Source: NPPO of the Netherlands (2013-11).

Pest Risk Analysis Blueberry scorch virus, October 2012.
http://www.nvwa.nl/onderwerpen/english/dossier/pest-risk-analysis/evaluation-of-pest-risks

Additional key words: detailed record **Computer codes:** FUSAFO, NL

2014/006 First report of Grapevine Pinot gris virus in Italy

Grapevine Pinot gris virus (*Trichovirus*, GPGV) is a new virus of grapevine which was originally identified in 1 plant (*Vitis vinifera* cv. 'Pinot gris') showing a syndrome characterized by chlorotic mottling and leaf deformations, in the Autonomous Province of Trento, in Italy. This plant was also infected by 3 other viruses (*Grapevine rupestris stem pitting-associated virus*, Grapevine rupestris vein feathering virus and Grapevine Syrah virus 1) and 2 viroids (*Hop stunt viroid* and *Grapevine yellow speckle viroid 1*). In the initial study, a limited field survey for the presence of GPGV in diseased and symptomless plants from three different cultivars did not allow the virus to be clearly associated with the observed symptoms. GPGV is phylogenetically closest to Grapevine berry inner necrosis virus, another *Trichovirus* which has been found in Japan and is transmitted by eriophyid mites. Studies are being carried out in Italy to better understand the epidemiology of GPGV.

The NPPO of Italy recently informed the EPPO Secretariat about the detection of GPGV in a commercial vineyard located in San Giorgio Piacentino (province of Piacenza), in the region of Emilia-Romagna. The grower had reported poor vegetation and strong production reduction in the affected vineyard. Disease symptoms were observed on 10-20 year-old grapevine plants (*Vitis vinifera* cvs. 'Pinot noir', 'Pinot gris', 'Chardonnay' and 'Sauvignon') but not on young plants. The disease was observed on approximately 8 ha of the vineyard (total vineyard surface is 13 ha) with 20% of the plants showing symptoms. In August 2013, the identity of the virus was confirmed by the virology laboratory of the University of Bologna, using RT-PCR. For the moment, no phytosanitary measures are taken but a PRA is in progress.
The pest status of Grapevine Pinot gris virus in Italy is officially declared as: **Present, identified in one grapevine orchard in Piacenza province.**

Note: Interestingly, GPGV has also been reported from the Republic of Korea. In September 2010, inner necrosis of berries and poor fruit set were found in grapevine cv. Tamnara (*Vitis vinifera x V. labrusca*) in Siheung (Gyeonggi province). Approximately 1.7% of the 300 vines were affected. The berry symptoms resembled those reported for Grapevine berry inner necrosis virus in Japan, although necrosis in shoots, shortened internodes and mosaic patterns on leaves were not observed. The identity of the virus was confirmed by molecular analysis (RT-PCR, sequencing).

Source: Cho IS, Jung SM, Cho JD, Choi GS, Lim HS (2013) First report of Grapevine pinot gris virus infecting grapevine in Korea. *New Disease Reports* **27**, 10.
http://dx.doi.org/10.5197/j.2044-0588.2013.027.010

Giampetruzzi A, Roumi V, Roberto R, Malossini U, Yoshikawa N, La Notte P, Terlizzi

F, Credi R, Saldarelli P (2012) A new grapevine virus discovered by deep sequencing of virus- and viroid-derived small RNAs in cv Pinot gris. *Virus Research* **163**, 262-268.

Martelli GP (2012) Grapevine virology highlights: 2010-2012. Proceedings of the 17th Congress of ICVG (Davis, US, 2012-10-07/14).

NPPO of Italy (2013-10).

Additional key words: new pest, new record **Computer codes:** GPGV00, IT, KR

2014/007 First report of *Meloidogyne ethiopica* in Turkey

In Turkey, during a routine survey for root-knot nematodes of tomato (*Solanum lycopersicum*) and cucumber crops (*Cucumis sativus*), severe stunting, leaf wilting and extensive root galling were detected in summer 2009. These symptoms were observed in 2 tomato greenhouses of the University of Ondokuz Mayıs (Samsun) and in several commercial cucumber greenhouses in Çarşamba district (Samsun province). Laboratory studies (morphology, esterase patterns, sequencing) of *Meloidogyne* female specimens collected from infested roots confirmed the presence of *Meloidogyne ethiopica* (EPPO Alert List). It is noted that *M. ethiopica* may pose a threat for Turkish vegetable production since it has a wide host range, and that further studies are needed to determine its distribution in Turkey. This is the first report of *M. ethiopica* in Turkey.
The situation of *Meloidogyne ethiopica* in Turkey can be described as follows: **Present, first found in 2009 on tomato and cucumber crops in the province of Samsun.**

Source: Aydınlı G, Mennan S, Devran Z, Širca S, Urek G (2013) First report of the root-knot nematode *Meloidogyne ethiopica* on tomato and cucumber in Turkey. *Plant Disease* **97**(9), p 1262.

Additional key words: new record **Computer codes:** MELGET, TR

2014/008 First report of *Meloidogyne fallax* in the USA

In recent years, root-knot nematodes (*Meloidogyne* spp.) have emerged as important pests on golf course greens in the Western USA. During a survey carried out from 2008 to 2011 in 238 golf courses in 7 states, the following 5 species were found: *Meloidogyne chitwoodi* (EPPO A2 List), *M. graminis, M. marylandi, M. minor* and *M. naasi.* At the end of 2011, samples were received from golf courses in King county (Washington state) and San Francisco county (California). The isolate from Washington was identified as *M. minor* however, the isolate from California was identified as *M. fallax* (EPPO A2 List), which represented the first record of this nematode species in the USA. The initial morphological identification was confirmed by molecular methods.
The situation of *Meloidogyne fallax* in the USA can be described as follows: **Present, first found in 2011 in soil samples from golf courses in California (San Francisco county).**

Source: Nischwitz C, Skantar A, Handoo ZA, Hult MN, Schmitt ME, McClure MA (2013) Occurrence of *Meloidogyne fallax* in North America, and molecular characterization of *M. fallax* and *M. minor* from U.S. golf course greens. *Plant Disease* **97**(11), 1424-1430.

Additional key words: new record **Computer codes:** MELGFA, US

2014/009 First report of *Anthonomus eugenii* in Italy

In November 2013, the presence of *Anthonomus eugenii* (Coleoptera: Curculionidae – EPPO A1 List) was reported for the first time in Italy. During official inspections, the pest was found in the municipalities of Fondi and Monte San Biagio (province of Latina, Lazio region) on *Capsicum annuum* crops grown under glasshouse (0.3 ha) and in the field (0.5 ha). The NPPO noted that this area is isolated from other horticultural areas by mountains. In infested crops, young capsicum fruits had fallen prematurely to the ground and showed oviposition marks and exit holes. In some fruits, living larvae and secondary rots could also be observed. However, as the pest was detected at the end of the growing season no severe economic damage was reported by the growers. The identity of the pest was confirmed by the University of Napoli. Phytosanitary measures were taken to eradicate *A. eugenii* and included: the destruction of infested capsicum crops, specific surveys of host plants to delimit the extent of the infestation, and an information campaign to warn growers and other stakeholders about the possible presence of *A. eugenii*. Preliminary results of surveys conducted in the province of Frosinone, where capsicum are commonly grown, did not detect the pest. Research studies are being carried out to develop control strategies against *A. eugenii* and a PRA is under way.
The pest status of *Anthonomus eugenii* in Italy is officially declared as: **Transient, under eradication.**

Source: NPPO of Italy (2013-11).

Additional key words: new record **Computer codes:** ANTHEU, IT

2014/010 Update on the situation of *Anoplophora glabripennis* in Veneto region (IT)

In Italy, *Anoplophora glabripennis* (Coleoptera: Cerambycidae – EPPO A1 List) was found for the first time in Lombardia in June 2007 where it is subject to eradication measures (EPPO RS 2007/166). In 2009 and 2010, isolated outbreaks were discovered in the Veneto region where eradication measures were also applied. In the Veneto region, the pest was detected in the municipalities of Cornuda (1 infested *Acer ginnala* in a private garden - EPPO RS 2009/157) and Maser (several infested trees - EPPO RS 2010/201).
The NPPO of Italy recently informed the EPPO Secretariat of the results of the ongoing eradication programme which is being conducted in the Veneto region. From 2009-2013, all infested trees and trees presenting suspicious symptoms were felled and burnt. Surveys (visual inspections from the ground and using tree climbers) have been carried out in the demarcated area (7.2 ha) which includes parts of several municipalities, all located in the province of Treviso (Cornuda, Crocetta del Montello, Pederobba, Montebelluna, Caerano San Marco, Maser, Asolo and Altivole). During the period 2009-2013, 24 292 plants were inspected, 1 133 were found infested (or possibly infested) and 1 013 were destroyed. Infested tree species were as follows: *Acer* (37%), *Ulmus* (29%), *Betula* (18%), *Salix* (13%), *Aesculus* (2%), others (1% - *Prunus, Populus, Cercidiphyllum*). As a consequence of eradication measures, the number of infested trees has gradually been reduced from 2009 to 2013 in the demarcated area (i.e. from 576 infested trees for the period June 2009/May 2010 to 67 infested trees for the period June 2012/May 2013). The eradication programme will continue in Veneto region.

Source: NPPO of Italy (2013-11).

Additional key words: detailed record **Computer codes:** ANOLGL, IT

2014/011 First report of *Rhagoletis suavis* in Germany

The NPPO of Germany recently informed the EPPO Secretariat of the first record of *Rhagoletis suavis* (Diptera: Tephritidae – EU Annexes) on its territory. This is also the first record of this North American fruit fly in the EPPO region. On 2013-08-12, *R. suavis* was found on walnut (*Juglans* sp.) in a private garden in Kleinmachnow (Brandenburg). No symptoms were observed. The pest was caught in yellow sticky traps. The pest was identified morphologically and the identification was verified by molecular methods (sequencing). The origin of this introduction is unclear. It is recalled that in 2012, fruit flies belonging to the genus *Rhagoletis* had been found in Kleinmachnow and Werder/Havel in Brandenburg. They were identified morphologically and it was assumed that they were *Rhagoletis completa*, but the identification was not verified by molecular methods. After the finding of *R. suavis* in 2013, there is now some doubt as to whether the morphological identification made in 2012 was correct. The possible effective phytosanitary measures are currently being evaluated.
The pest status of *Rhagoletis suavis* in Germany is officially declared as: **Present, only in one area (in Brandenburg)**

Source: NPPO of Germany (2013-10).

Additional key words: new record **Computer codes:** RHAGSU, DE

2014/012 First report of *Aproceros leucopoda* in the Czech Republic

The NPPO of the Czech Republic recently informed the EPPO Secretariat of the first record of *Aproceros leucopoda* (Hymenoptera: Argidae – EPPO Alert List) on its territory. In August 2013, the pest was found during an official survey carried out by the NPPO in the district of Trutnov, Hradec Králové region. The pest was detected in a forest on 13 plants of *Ulmus minor* and *U. glabra*, on 2 nearby sites (separated by a distance of 830 m). Characteristic zigzag feeding tracks were observed on elm leaves, as well as larvae, cocoons and imagoes. The insect was identified on the basis of the larval and adult morphological characteristics by the NPPO diagnostic laboratory. The source of this infestation is not known but it is considered that this new record corresponds to natural spread from neighbouring countries. In September 2013, feeding damage on elm trees was also observed in other localities of the same region, in the districts of Jičín and Trutnov. No official measures were taken, but an information leaflet (in Czech - http://eagri.cz/public/web/file/255725/Listovka_Pilatenka_nahled.pdf) was published to inform the public about this invasive pest.
The pest status of *Aproceros leucopoda* in the Czech Republic is officially declared as: **Present, only in some areas.**

Source: NPPO of the Czech Republic (2013-11).

Additional key words: new record **Computer codes:** APRCLE, CZ

2014/013 First report of *Rhynchophorus ferrugineus* in Yemen

In May 2013, the presence of *Rhynchophorus ferrugineus* (Coleoptera: Curculionidae – EPPO A2 List) was recorded for the first time in Yemen. The pest was found in Wadi-Hadhramout on date palms (*Phoenix dactylifera*). All stages of the insect (larvae, pupae and adults) were observed in infested date palm trees. The origin of this introduction is unknown. A monitoring programme will be undertaken in the infested area and all other date palm-growing areas in Yemen.
The situation of *Rhynchophorus ferrugineus* in Yemen can be described as follows: **Present, first found in 2013.**

Source: Assggaf SM (2013) First record of the red palm weevil [*Rhynchophorus ferrugineus* Oliv. (Coleoptera: Curculionidae)] in Yemen. *Arab and Near East Plant Protection Newsletter* no. 60, 6-7.

Additional key words: new record **Computer codes:** RHYCFE, YE

2014/014 First report of *Pistosia dactyliferae* in Southern France

In 2004, *Pistosia dactyliferae* (Coleoptera: Chrysomelidae) was identified for the first time in France in the municipality of Saint-Jean-Cap-Ferrat (Alpes-Maritimes department) on different palm trees (*Phoenix canariensis, Chamaerops humilis* and *Washingtonia* sp.). *P. dactylifera* is a palm borer which is thought to originate from India and whose biology is largely unknown. In the infested site, chemical control measures were applied, and in 2006, *P. dactylifera* was considered to be eradicated. However, in 2012 during the official surveillance programme for *Rhynchophorus ferrugineus*, *P. dactyliferae* was found again. The pest was observed in a botanical garden and several sites (total outbreak area of approximately 17 ha), all located in the municipality of Saint-Jean-Cap-Ferrat. The pest was observed on several species of palm trees: mainly *Phoenix, Washingtonia, Chamaerops, Trachycarpus* spp., and to a lesser extent on *Calamus, Metroxylon, Rhapidophylum* and *Sabal* spp. The origin of this introduction is unknown but it is suspected that the import of infested ornamental palms is the most likely pathway. Larvae of *P. dactyliferae* develop inside palm stipes and can eventually destroy the apical bud. Attacked palm trees show brown petioles, desiccated palms (with small leaf perforations on *Phoenix*), feeding damage on palm rachis and presence of sawdust. Larvae are often observed at the bases of the palms, and adults can be found at the palm bases or inside folded palms. Adults are small (5.5-6 mm long) brownish-red chrysomelids. Studies are being carried out in Southern France on the biology of this pest and on possible control methods, including the use of the entomopathogenic fungus, *Beauveria bassiana*.

According to the literature, the following tentative distribution list for *P. dactylifera* could be gathered:
EPPO region: France (Saint-Jean-Cap-Ferrat). In their paper, Besse *et al*. (2012) mention that *P. dactyliferae* was found in 2006 in a nursery in Pistoia (Toscana region, Italy) but this could not confirmed by any other publication.
Asia: China (Yunnan), India (Bihar, Tamil Nadu), Taiwan, Thailand.

Source: Besse S, Panchaud K, Gahlin S (2013) Palmiers, encore un nouveau ravageur. *Phytoma* no. 661, 14-17.

Drescher J, Martinez M (2005) Le coléoptère *Pistosia dactyliferae* menace les palmiers du sud de la France. *PHM - Revue Horticole* no. 468, 34–35 (abst.).

Panchaud K, Dusoulier F (2013) Observations de terrain et premiers éléments de biologie chez *Pistosia dactyliferae* (Maulik, 1919). Annales de la 3ème Conférence AFPP sur l'entretien des espaces verts, jardins, gazons, forêts, zones aquatiques et autres zones non agricoles (Toulouse, FR, 2013-10-15/17). http://draaf.aquitaine.agriculture.gouv.fr/IMG/pdf/Annales_3e_Conf_ZNA_cle8ab3c9.pdf

Staines CL (2012) Catalogue of the hispines of the world (Coleoptera: Chrysomelidae: Cassidinae). Tribe Gonophorini. http://entomology.si.edu/coleoptera/hispines/PDFs_2012updates/Gonophorini-2012revision.pdf

Additional key words: new record **Computer codes:** PISTDA, FR

2014/015 New data on quarantine pests and pests of the EPPO Alert List

By searching through the literature, the EPPO Secretariat has extracted the following new data concerning quarantine pests and pests included on the EPPO Alert List. The situation of the pest concerned is indicated in bold, using the terms of ISPM no. 8.

- **New records**

Bois noir, the grapevine yellows associated with '*Candidatus* Phytoplasma solani', has been recorded for the first time in Jordan. The pathogen was detected during a survey carried out in August and October 2012 in vineyards showing typical symptoms of grapevine yellows (leaf discoloration and curling, berry shrivelling and irregular maturation of wood). '*Ca*. P. solani' was also detected in bindweed (*Convolvulus arvensis*) growing in infected vineyards. Further studies will be carried out to investigate the role of *Hyalesthes obsoletus* in the disease transmission in Jordan (Salem *et al*., 2013). **Present, first found in 2012.**

In Pakistan, *Iris yellow spot virus* (*Tospovirus*, IYSV – formerly EPPO Alert List) was detected for the first time during a survey conducted in onion crops (*Allium cepa*) from March to May 2012. This survey had been initiated because suspect symptoms had been observed on bulb and seed onions grown in farmers' fields in Faisalabad, Nankana, Sheikhupura and Sialkot districts of Punjab (Iftikhar *et al*., 2013). **Present, first found in 2012 in onion crops in Punjab.**

In Ukraine, *Tuta absoluta* (Lepidoptera: Gelechiidae – EPPO A2 List) has recently been found in the Autonomous Republic of Crimea (1 ha) and the Odessa region (8 ha) (Fedorenko & Pylypenko, 2012). **Present, under official control.**

The Asian soybean rust, *Phakopsora pachyrhizi* (formerly EPPO Alert List) was found for the first time in Puerto Rico in February 2011 (Estévez de Jensen *et al*., 2013). **Present, no details.**

In February 2013, single and double flowered impatiens (*Impatiens walleriana*) affected by downy mildew were observed in nurseries and in the wild in central Taiwan. Laboratory analysis confirmed the presence of *Plasmopara obducens* (formerly EPPO Alert List) (Shen *et al*., 2013). **Present, first found in 2013 in central Taiwan.**

In Japan, *Plasmopara obducens* (formerly EPPO Alert List) was detected for the first time in June 2010 on *Impatiens walleriana* plants in a glasshouse located in the Yamagata prefecture. In March 2012, it was also detected in a plastic tunnel nursery in Shimane prefecture (Satou *et al.*, 2013). **Present, first detected in 2010 in Yamagata prefecture and again in 2012 in Simane prefecture.**

- **Detailed records**

Cydalima perspectalis (Lepidoptera: Crambidae – formerly EPPO Alert List) was detected in October 2013 in the city and the national park of Sotchi (Krasnodar), Southern Russia. It is suspected that the pest was introduced with infested boxwood plants (*Buxus* spp.) imported for the landscaping of the Olympic village. Previously, *C. perspectalis* was only known to occur in the Russian Far East (Federal Forestry Agency, 2014).

In China, *Monilinia fructicola* (EPPO A2 List) has been detected in fruit samples collected from peach orchards (*Prunus persica*) in the provinces of Gansu, Hubei and Yunnan (Yin *et al.*, 2013).

In Brazil, *Tomato chlorosis virus* (*Crinivirus*, ToCV – EPPO A2 List) was first found in 2006 near Sumaré, São Paulo State. Soon after, the virus was also found in the main tomato-producing regions of Brazil (states of Bahia, Espírito Santo, Goías, Minas Gerais, Rio de Janeiro, and Distrito Federal). Recent genetic studies indicated that ToCV outbreaks in Brazil result from a single and recent introduction, most probably via infected vegetative material originating from Mediterranean countries (Barbosa *et al.*, 2013).

In the USA, *Meloidogyne enterolobii* (EPPO A2 List) was detected in cotton (*Gossypium hirsutum*) and soybean (*Glycine max*) crops in North Carolina (Ye *et al.*, 2013).

- **Eradication**

In the USA, isolated outbreaks of *Potato spindle tuber viroid* (*Pospiviroid*, PSTVd – EPPO A2 List) had occasionally been found in the past. As of December 2013, PSTVd has been eradicated in all potato-producing states. The isolated outbreaks recently detected in glasshouse tomatoes (California and North Carolina – see EPPO RS 2011/154 and 2013/087) have also been eradicated (pers. comm. with Christina Devorshak, USDA-APHIS, 2013-12).
The pest status of *Potato spindle tuber viroid* in the USA is officially declared as: **Eradicated.**

- **New host plants**

In California (US), *Cinnamomum camphora* (Lauraceae - camphor tree) has been shown to be a host plant of *Phytophthora ramorum* (EPPO A2 List). The pathogen was detected in samples which had been collected from urban trees located in Mill Valley (Marin county) and nursery trees (Sacramento county). Diseased trees showed branch dieback and decline, shoot blight, as well as patchy and irregular cankers on branches. Nursery plants showed reddish leaves with small necrotic spots surrounded by green halos (Rooney-Latham *et al.*, 2013).

In Brazil, downy mildew caused by *Plasmopara halstedii* (EU Annexes) has been detected since winter 2009, on *Gerbera jamesonii* grown in an experimental glasshouse of the University of Viçosa (state of Minas Gerais). This is the first documented report of *P. halstedii* on *Gerbera jamesonii* (Duarte *et al*., 2013).

- **Diagnostics**

A new diagnostic method using the loop-mediated amplification (LAMP) has been developed to detect *Clavibacter michiganensis* subsp*. michiganensis* (EPPO A2 List). The authors considered that this method has the potential to provide an easy, one-step test for a rapid identification of this bacterium (Yasuhara-Bell *et al.*, 2013).

A new protocol for a rapid DNA isolation from *Bactericera cockerelli* (psyllid vector of potato zebra chip disease - EPPO A1 List) has been developed in the USA. This protocol can be used directly with DNA-based methods (conventional and loop-mediated PCRs) for the detection of '*Candidatus* Liberibacter solanacearum', the causal agent of potato zebra chip disease. It is expected that this protocol can also be used for the detection of other *Liberibacter* species in their psyllid vectors, in particular for '*Ca*. L. asiaticus' in *Diaphorina citri* (Lévy *et al*., 2013).

Source:

Barbosa JC, Rezende JAM, Filho AB (2013) Low genetic diversity suggests a single introduction and recent spread of *Tomato chlorosis virus* in Brazil. *Journal of Phytopathology* **161**(11-12), 884-886.

Duarte LL, Choi YJ, Barreto RW (2013) First report of downy mildew caused by *Plasmopara halstedii* on *Gerbera jamesonii* in Brazil. *Plant Disease* **97**(10), p 1382.

Estévez de Jensen C, Harmon CL, Vitoreli A (2013) First record of Asian soybean rust caused by *Phakopsora pachyrhizi* in Puerto Rico. *Plant Disease* **97**(10), p 1378.

Fedorenko V, Pylypenko L (2012) Quarantine and invasive species in Ukraine. *Progress in Plant Protection* **52**(4), 1156-1164.

Federal Forestry Agency. Centre of Forest Health of Krasnodar region. [Boxwood moth, *Cydalima perspectalis* (Walker, 1859) introduced into the relict forests of the Krasnodar region]. http://czl23.ru/news.php?extend.102 (in Russian).

Iftikhar R, Bag S, Ashfaq M, Pappu HR (2013) First report of *Iris yellow spot virus* infecting onion in Pakistan. *Plant Disease* **97**(11), p 1517.

Lévy L, Hancock J, Ravindran A, Gross D, Tamborindeguy C, Pierson E (2013) Methods for rapid and effective PCR-based detection of '*Candidatus* Liberibacter solanacerum' from the insect vector *Bactericera cockerelli*: streamlining the DNA extraction/purification process. *Journal of Economic Entomology* **106**(3), 1440-1445.

Personal communication with Christina Devorshak (USDA-APHIS, 2013-12).

Rooney-Latham S, Honeycutt E, Ochoa J, Grünwald NJ, Blomquist CL (2013) First report of camphor tree (*Cinnamomum camphora*) as a host of *Phytophthora ramorum*. *Plant Disease* **97**(10), 1377-1378.

Salem NM, Quaglino F, Abdeen A, Casati P, Bulgari D, Alma A, Bianco PA (2013) First report of '*Candidatus* Phytoplasma solani' strains associated with grapevine bois noir in Jordan. *Plant Disease* **97**(11), p 1505.

Satou M, Sugawara K, Nagashima S, Tsukamoto T, Matsushita Y (2013) Downy mildew of busy lizzie caused by *Plasmopara obducens* in Japan. *Journal of General Plant Pathology* **79**(3), 205-208.

Shen YM, Huang JH, Liu HL (2013) First report of downy mildew caused by *Plasmopara obducens* on impatiens in Taiwan. *Plant Disease* **97**(11), 1512-1513.

Yasuhara-Bell J, Kubota R, Jenkins DM, Alvarez AM (2013) Loop-mediated amplification of the *Clavibacter michiganensis* subsp. *michiganensis mic*A gene is highly specific. *Phytopathology* **103**(12), 1220-1226.

Ye WM, Koenning SR, Zhuo K, Liao JL (2013) First report of *Meloidogyne enterolobii* on cotton and soybean in North Carolina, United States. *Plant Disease* **97**(9), p 1262.

Yin LF, Chen SN, Yuan NN, Zhai Lx, Li GQ, Luo CX (2013) First report of peach brown rot caused by *Monilinia fructicola* in Central and Western China. *Plant Disease* **97**(9), 1255-1256.

Additional key words: absence, detailed record, diagnostics, eradication, host plant, new record

Computer codes: CORBMI, DPHNPE, GNORAB, IYSV00, LIBEPS, MELGMY, MONIFC, PARZCO, PHAKPA, PHYPSO, PHYTRA, PLASHA, PLASOB, PSTVD0, TOCV00, BR, CN, JO, JP, PK, PR, RU, TW, UA, US

2014/016 *Arctotheca calendula* in the EPPO region: addition to the EPPO Alert List

Why

Arctotheca calendula (Asteraceae) is an annual or perennial plant native to South Africa. One of its common names is 'Cape Weed'. The species has been introduced in the USA and in Australia where it is listed as invasive, as well as in Japan, and New Zealand. The species is present in seven countries in the EPPO region and due to its invasive behaviour and potential economic impact, the EPPO Panel on Invasive Alien Plants suggested its inclusion in the EPPO Alert list.

Geographical distribution

EPPO region: France (including Corsica), Israel, Italy (including Sardinia and Sicily), Morocco, Portugal (including Azores), Spain (including Canarias), Tunisia.
North America: USA (California).
South America: Argentina, Chile.
Africa (native): Lesotho, South Africa.
Asia: Japan.
Oceania: Australia (Northern Territory, New South Wales, Queensland, South Australia, Tasmania, Victoria and Western Australia), New Zealand.

Note: in Sardinia*, A. calendula* is recorded in a campsite in the Lipari Islands. In France, the species is recorded in campsites in the Landes and in the Pyrénées Atlantiques departments as well as in Corsica. In Belgium, the species has been observed as casual and was introduced as seeds in wool. The species is also reported as casual in the Czech Republic, Kriti (Greece), Sweden and the United Kingdom.

Morphology

A. calendula is a rosette-forming annual or perennial that can grow up to 80 cm wide and 30 cm high. It has purple or yellow daisy-like composite flowers that can reach 6 cm in diameter, its petal-like ray florets are yellow above and grey-green below. The plant is characterized by its deeply lobed basal leaves that are white and downy underneath and are 5-25 cm long, 2-6 cm wide, on a stalk up to 6 cm long. The upper surface of leaves can be hairless to hairy. If any upper leaves are present, they are generally amplexicaul. The area where seeds attach to the head (receptacle) is pitted. Seeds are covered in pale brown wool and topped by 6–8 short scales.

Biology and ecology

The biology of *A. calendula* is poorly understood. Plants develop into rosettes, then flower in late spring and early summer. The plant is pollinated primarily by butterflies. A sterile, vegetatively reproducing yellow-flowered type also exists. This is considered by some experts to be a separate species, and it is noted to spread via creeping stolons. The sexually reproducing *A. calendula* can spread rapidly by seeds (up to 4300 seeds are produced per plant), typically colonizing open or disturbed sites with exposed soil.
Plants tolerate drought but are damaged by frosts a few degrees below freezing and are killed by colder temperatures. The plant is reported to prefer sunny areas and sandy, well-drained soil. Dormancy allows seeds to escape the effects of control measures and provides a mechanism for prolonged seed survival in soil.

In which habitats

A. calendula is usually found infesting disturbed, agricultural land, urban, roadsides, stream banks, heavily grazed pastures, sand dunes and coastal areas, but has also been found in Sardinia as a weed of natural grasslands and cultivated forage crops since 1998.

According to the CORINE land cover classification, the following habitats are suitable for the plant: arable land; pastures; natural grassland; deserts (sparsely vegetated areas); banks of continental water; riverbanks / canalsides (dry river beds); road and rail networks and associated land; other artificial surfaces (wastelands); green urban areas, including parks, gardens, sport and leisure facilities.

Pathways

The plant is known to be used as groundcover and may also be used as an ornamental or medicinal plant. In Australia, the plant was introduced from South Africa, probably as a contaminant of packing material, stock fodder and sheep fleeces. *A. calendula* was introduced into Europe in the middle of the 19th century. In Europe, it is thought to have been accidentally imported as a contaminant of Leguminosae of non-European origin, in particular from Australia. Likely pathways of entry also include contaminated seed and grain. The plant is currently spreading around the Mediterranean area as a contaminant of seed, of machinery, of soil, and via movement of livestock and humans, in particular of campers. In addition, *A. calendula* is naturally spread by wind and water.

Impacts

A. calendula is a weed of cereals, oil seed rape and legumes in Australia; it has been estimated to cost 9.7 million AUD per annuum in yield losses in annual winter crops including wheat, oats, barley, oil seed rape, and pulses, not counting pre and post emergent control costs. The species also dominates pastures in Australia and reduces the value of stock by lowering their weight.

The plant also has impacts on animal health. Seeds of the plant may be embedded in light wool which when ingested by animal can be fatal. Grazing is thought to taint milk, and where *A. calendula* is the dominant feed, nitrate poisoning of stock is possible. *A. calendula* accumulates cadmium (which occurs as a contaminant in phosphate fertilizers), which has an adverse effect on animal production and pasture production.

Ecological impacts of *A. calendula* have been reported. In California, it is reported to be an aggressive competitor for water and space and to seriously threaten native plant communities by crowding out grasses, herbs and small shrubs, in particular in coastal grasslands and riparian zones. In such habitats, the plant has been observed to form impenetrable monospecific stands. On the other hand, in Western Australia, the plant seems to be a relatively poor competitor with native species, but if established, it can have a moderate impact on native plant communities.

Impacts on humans have been reported, as *A. calendula* can cause hay fever and dermatitis.

Control

As *A. calendula* has been considered to be an agricultural weed for some time in Australia, agricultural methods have been developed to manage it in cultivated fields, such as using crops tolerant to herbicides (essentially triazine, imidazolinone and glyphosate), traditional weed-control techniques (inversion plowing, delayed sowing, fallow and pre-sowing cultivation) and selective herbicides (clopyralid, MCPA or 2,4-D depending on the pasture type). In Australia, *A. calendula* is reported to be resistant to diquat and paraquat. Manual removal may be appropriate for small infestations. Application of a polyethylene film has proven to exhaust stored food reserves of the plant and to kill 99% of covered plants when applied for a minimum period of one and a half years. Mechanical methods can also be used, e.g. removal of the soil surface with a tractor, but needs to be followed by surveillance and manual removal of all regrowth.

Source: Akeroyd JR (1989) *Arctotheca calendula* (L.) Levyns. In: Greuter W, Raus Th (eds.), Med-Checklist Notulae, 15. *Willdenowia* **19**, 27-48.

CABI Invasive Species Compendium, *Arctotheca calendula.* http://www.cabi.org/isc/?compid=5&dsid=6729&loadmodule=datasheet&page=481&site=144

California Invasive Plant Council – *Arctotheca calendula.* http://www.cal-ipc.org/ip/management/ipcw/pages/detailreport.cfm@usernumber=7&surveynumber=182.php

Crisafulli A, Cannavo S, Maiorca G, Musarella CM, Signorino G, Spampinato G (2010) Aggiornamenti floristici per la Calabria. *Informatore Botanico Italiano* **42**(2), 437-448.

DAISIE, *Arctotheca calendula.* http://www.europe-aliens.org/speciesFactsheet.do?speciesId=22002#

Flora of Israel Online, *Arctotheca calendula* (L.) Levins. http://flora.huji.ac.il/browse.asp?action=specie&specie=ARCCAL

Florabase, the Western Australian Flora. *Arctotheca calendula.* http://florabase.dpaw.wa.gov.au/browse/profile/7838

Harvey WH & Sonder OW (1894) Flora Capensis 3. Reeve L & Co. Eds

Jeanmonod D & Schlüssel A (2010) Notes et contributions à la flore de Corse, XXIII. *Candollea* **65**, 267-290.

Karlsson T (1998) Förteckning över svenska kärlväxter. Svensk botanisk tidskrift utgifven af svenska botaniska föreningen Stockholm 91(5), 241-560.

Le Floc'h E, Boulos F & Vela E (2010) Catalogue synonymique commenté de la flore de Tunisie. République Tunisienne. Ministère de l'Environnement et du Développement Durable. Banque nationale de Gènes. 504 pp.

Lehtonen P (2009) Weed Risk Assessment for *Arctotheca calendula* (L.) Levyns. Capeweed. United States Department of Agriculture. 21 pp. http://www.aphis.usda.gov/plant_health/plant_pest_info/weeds/downloads/wra/ArctothecacalendulaWRA.pdf

Madon O (1994) Un taxon introduit nouveau pour l'Italie: *Arctotheca calendula*. *Flora Mediterranea* **4**, 201-202.

Medina M (2006) *Arcotheca calendula* (L.) Levyns; Asteraceae (Compositae); especie invasora de suelos arenosos en la Región de la Aaucanía (IX), Chile Chloris Chilensis: Año 9 Nº 1. URL: http://www.chlorischile.cl

National Institute for Environmental Studies, Japan, List of alien species in Japan. http://www.nies.go.jp/biodiversity/invasive/resources/listen_asteraceae.html

Oberprieler Ch & Vogt R (1994) Chromosome numbers of North African phanerogams. II. *Willdenowia* **23**, 211-238.

Pyšec P, Sádlo J & Mandák B (2002) Catalogue of alien plants of the Czech Republic. *Preslia* **74**, 97-186.

Sanz Elorza M, Dana Sánchez DD & Sobrino Vesperinas E (2004) Atlas de las plantas alóctonas en España. Ministerio de Medio Ambiante. 378 pp.

Silva L, Pinto N, Press B, Rumsey F, Carine M, Henderson S & Sjögren E (Undated) List of vascular plants (Pteridophyta and Spermaphyta), 131-155. http://www.azores.gov.pt/NR/rdonlyres/3E255F0D-6AFD-4EF8-974D-CF920B5F933E/126780/42_Pteridophyta_Spermatophyta1.pdf

Siverio A, Sobrino E, Rodríguez H & Arévalo JR (2011) Weeds of golf courses on the island of Tenerife. (Malas hierbas de los campos de golf de la isla de Tenerife.) In: Plantas invasoras resistencias a herbicidas y detección de malas hierbas. XIII Congreso de la Sociedad Española de Malherbología, La Laguna, Spain, 22-24 November 2011 [ed. by Arévalo J, Fernández R, López S, Recasens F & Sobrino J E.]. Madrid, Spain: Sociedad Española de Malherbología (Spanish Weed Science Society), 83-86.

Sulas L (2000) La calendula del Sud Africa. *Sardegna agricoltura* **4**, 6-8.

United States Department of Agriculture, Natural Resources Conservation Service, *Arctotheca calendula* (L.) Levyns. http://plants.usda.gov/core/profile?symbol=arca45

Verloove F (2005) Catalogue of neophytes in Belgium (1800-2005). Meise, National Botanic Garden of Belgium. 89 p.

Virtual Herbarium of Australia, *Arctotheca calendula.*

http://avh.ala.org.au/occurrences/search?taxa=arctotheca+calendula#tab_mapView

Webb CJ, Sykes WR & Garnock-Jones PJ (1988) Flora of New Zealand. Vol. IV. Naturalised Pteridophytes, Gymnosperms, Dicotyledons.Christchurch, New Zealand, Botany Division, D.S.I.R.

Additional key words: invasive alien plants, alert list **Computer codes:** AROCA

2014/017 Transportation of non-indigenous species via soil on international aircraft passengers' footwear

The potential for transported soil to harbour and spread non-indigenous species is widely recognized and many National Plant Protection Organizations restrict or prohibit such movement. A study was undertaken on organisms present in soil that had been removed from footwear being carried in the baggage of international aircraft passengers arriving in New Zealand. This study highlighted the high incidence and diversity of viable bacteria, fungi, nematodes and seeds, as well as several live arthropods occurring in this soil. Among the genera detected, it is noted that species belonging to these genera are regulated in New Zealand. The organisms detected included bacteria (found in 100% of samples), fungi (98%), seeds (57%), nematodes (65%) and other mesofauna (38%).

Concerning seeds, a total of 446 seeds was recovered from 155 samples (this is considered to underestimate the total number as some were missed during searches). Seeds occurred in 57% of samples, and on average 1 g of soil contained 2.5±0.37 seeds. Overall, 69% of the seeds were found to be viable, 9 plant types dominated, in particular grass and tree seed.

The type, number of seeds found and the genera were as follows:

- Climber (1 seed): *Clematis*;
- Creeper (2 seeds): *Vitis*;
- Grass (160 seeds): *Agrostis, Andropogon, Dactylactenium, Deschampsia, Digitaria, Eragrostis, Festuca, Glyceria, Hordeum, Lachnagrostis, Lolium, Paspalum, Poa, Setaria, Sporobolus, Triticum, Vulpia* (Poaceae);
- Herb (46 seeds): *Amaranthus* (Amaranthaceae), *Arctotheca* (Asteraceae), *Asperugo* (Boraginaceae), *Capsicum* (Solanaceae), *Cleome* (Cleomaceae), *Fragaria* (Rosaceae), *Galium* (Rubiaceae), *Ipomoea* (Convolvulaceae), *Medicago* (Fabaceae), *Polygonum* (Polygonaceae), *Rumex* (Polygonaceae), *Trifolium* (Fabaceae), *Tropaeolum* (Tropaeolaceae);
- Sedge (2 seeds): *Scirpus* (Cyperaceae);
- Shrub (4 seeds): *Rubus* (Rosaceae);
- Tree/shrub (4 seeds): *Alnus* (Betulaceae), *Sambucus* (Adoxaceae);
- Tree (137 seeds): *Betula* (Betulaceae), *Platanus* (Platanaceae).

Sampling period and type of footwear had a significant impact on seed counts. Seed counts in both January and October were significantly higher than those in March-April. Furthermore, among footwear types, golf shoes had the highest seed counts.

Source: McNeill M, Phillips C, Young S, Shah F, Aalders L, Bell N, Gerard E & Littlejohn R (2011) Transportation of nonindigenous species via soil on international aircraft passengers' footwear. *Biological invasion* **13**, 2799-2815.

Additional key words: invasive alien plants **Computer codes:** 1AGSG, 1ALUG, 1AMAG, 1ANOG, 1AROG, 1ASGG, 1BETG, 1CLEG, 1CLVG, 1CPSG, 1DECG, 1DIGG, 1ERAG, 1FESG, 1FRAG, 1GALG, 1GLYG, 1HORG, 1IPOG, 1KLEG, 1LOLG, 1MEDG, 1PASG, 1PLTG, 1POAG, 1POLG, 1RUBG, 1RUMG, 1SAMG, 1SCPG, 1SETG, 1SPZG, 1TOPG, 1TRFG, 1TRZX, 1VITG, 1VLPG, NZ

2014/018 European Code of conduct for botanic gardens on invasive alien species

A European Code of conduct for botanic gardens on invasive alien species has been published by the Bern Convention. This Code of conduct is addressed to the staff of botanic gardens. The Code highlights the special role of botanic gardens in introducing thousands of plant species from around the world. Examples of invasive species known to have been introduced through European botanic gardens include *Elodea canadensis* (Hydrocharitaceae), *Senecio squalidus* (Asteraceae), *Heracleum mantegazzianum* (Apiaceae, EPPO List of Invasive Alien Plants) and *Oxalis pes-caprae* (Oxalidaceae).
The Code provides the following recommendations in the following sections:

1. Awareness

1.1 Ensure that all botanic garden personnel are made aware of the issues and problems posed by invasive alien organisms and are involved in formulating and implementing the policies adopted by the garden;
1.2 Be aware of which species are known to be invasive in Europe and especially in your country or region and of the risk they pose;
1.3 Ensure that the botanic garden complies with existing legislation and regulations regarding invasive alien species at a national, European and international level and that all relevant staff are made aware of them.

2. Share information

2.1 Share information with other botanic gardens and other organizations concerned with the impacts or control of invasive alien species.

3. Preventing new invasions

3.1 Undertake an audit of the existing collections in the botanic garden for invasion risk;
3.2 Try to ensure that no invasive or potentially invasive plants are unintentionally introduced into the collections;
3.3 Take great care when disposing of plant waste material from any part of the garden and do so responsibly;
3.4 Take great care in disposing of unwanted stocks of plants;
3.5 Consider adopting the International Plant Exchange Network (IPEN) Code of conduct;
3.6 If the botanic garden produces a seed list (Index Seminum), ensure that it does not freely offer seed or propagules of invasive or potentially invasive plants;
3.7 Be vigilant and ensure that staff report any signs of invasiveness shown by plants in the public collections and in the nursery areas;
3.8 Do not offer for sale known or potentially invasive species in garden shops or nurseries;
3.9 Adopt good labeling practices.

4. Control measures

4.1 Actual or suspected signs of invasive behavior should be carefully monitored;
4.2 Invasive plants or other organisms should be controlled or removed as soon as detected and confirmed.

5. Outreach

5.1 Engage with the public on the dangers of invasive alien plants and their economic consequences;
5.2 Suggest alternative species to invasive plants;
5.3 Alert those involved in revegetation schemes, including local authorities and landscape architects of the risks of IAS being included in commercial seed mixtures and provide advice on what materials to use.

6. Forward planning

6.1 Consider developing research activities on invasive species and becoming involved in collaborative research projects at national and regional levels;

6.2 Prepare for the impacts on botanic gardens in a period of global change.

Source: Heywood V with Sharrock S (2013) European Code of Conduct for Botanic Gardens on Invasive Alien Species. Council of Europe, Strasbourg, Botanic Gardens Conservation International, Richmond.

Additional key words: invasive alien plants, Code of conduct **Computer codes:** ELDCA, HERMZ, OXAPC, SENRP

2014/019 Outcomes of the 7th Annual Workshop of the International Pest Risk Mapping Workgroup, Raleigh (USA), 2013-10-14/17

The International Pest Risk Mapping Workgroup (IPRMW) is a group of scientists focused on improving the pest risk modelling and mapping processes through the application of rigorous, innovative research. The IPRMW includes government and university scientists from Europe, North America, Australia, New Zealand, and elsewhere.

The IPRMW met for its 7th annual meeting in Raleigh (USA) on 2013-10-14/17 and all presentations are available on the IPRMW website http://www.pestrisk.org/.

Source: EPPO Secretariat (2014-01).

Additional key words: invasive alien plants, mapping