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2015/108 First report of *Dryocosmus kuriphilus* in the United Kingdom

The NPPO of the United Kingdom recently informed the EPPO Secretariat of the first record of *Dryocosmus kuriphilus* (Hymenoptera: Cynipidae – EPPO A2 List) on its territory. The pest was found in sweet chestnut (*Castanea sativa*) in Farningham woods, Kent. In this woodland, covering 79 ha and classed as 'ancien semi natural', *C. sativa* is the predominant species but oaks (*Quercus* spp.) and ash (*Fraxinus excelsior*) are also present. The occurrence of *D. kuriphilus* has been confirmed on a number of trees, across an area with diameter of about 400 m (as of 2015-06-16). The infestation was initially reported by an amateur entomologist to the NPPO. This led to an official inspection in 2015-06-07 during which galls were sampled, and the identity of the pest was confirmed morphologically on 2015-06-11. For the moment, the source of this outbreak is not known but investigations are ongoing to verify whether the pest might have entered the UK with imports of infested plants for planting. Official control measures have been put in place to prevent any further spread and eradicate *D. kuriphilus*. Intensive surveys within a radius of 10 km around the infested woodland will be carried out. A wider surveillance programme across the UK will also take place.
The pest status of *Dryocosmus kuriphilus* in the United Kingdom is officially declared as: **Present, under eradication.**

Source: NPPO of the United Kingdom (2015-06).

Additional key words: new record **Computer codes:** DRYCKU, GB

2015/109 Updated situation of *Thrips setosus* in the Netherlands

The presence of *Thrips setosus* (Thysanoptera: Thripidae – EPPO Alert List) was reported for the first time in the Netherlands in October 2014 (see EPPO RS 2014/181). This was also the first record of *T. setosus* in Europe. Following this initial record in 1 production site of *Hydrangea* plants, a specific survey was completed at 9 other growers of *Hydrangea*. As a result, *T. setosus* was detected in 4 municipalities (Aalsmeer, Uithoorn, Alphen ann den Rijn, Bodegraven-Reeuwijk), on the premises of 4 growers (including outdoor areas). The pest was found on *Hydrangea* plants and weeds such as *Lamium purpureum, Heracleum sphondylium* and *Urtica dioica*. A preliminary risk analysis has been completed and indicated that the pest can survive outdoor conditions in the Netherlands. Considering the large numbers of infested plants observed at the 4 production sites, it is presumed that *T. setosus* was introduced several years ago into the Netherlands, probably via imports of infested plants for planting from Japan. As earlier sales of affected plants to the final consumers have taken place and as some stages of the pest are soil borne, it is also assumed that *T. setosus* is established in the Netherlands. No further official phytosanitary measures are taken against *T. setosus* in the Netherlands.
The pest status of *Thrips setosus* in the Netherlands is officially declared as: **Present, in several parts of the area where host plants are grown.**

Source: NPPO of the Netherlands (2015-05).
NVWA website. Pest reports Insects: https://www.nvwa.nl/onderwerpen/kennis-en-advies-plantgezondheid/dossier/pest-reporting/pest-reports

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

2015/110 *Apriona germari* and *Apriona rugicollis* are two distinct species

In September 2013, three species of *Apriona* were added to the EPPO A1 List: *Apriona germari, A. japonica* and *A. cinerea*, but recent taxonomic changes have occurred with significant consequences on their geographical distributions. In the revision of the genus *Apriona* published by Jiroux in 2011, *A. rugicollis* is no longer considered as a synonym of *A. germari* but as a distinct species. *A. japonica*, which was previously considered to be a distinct species, has been synonymized with *A. rugicollis*. Finally, *A. cinerea* remains a separate species. When taking these taxonomic changes into account, a live specimen of *Apriona* intercepted by the French NPPO in a container from China in June 2014 was confirmed to be *A. rugicollis*. Considering the revised geographical distributions of both species and the fact that *A. rugicollis* is more widely distributed in China than *A. germari*, it is likely that most interceptions made by EPPO member countries on wood packaging material imported from China concerned *A. rugicollis* and not *A. germari*.

- ***Apriona germari***

Because morphological variations were observed among specimens collected from the different parts of the geographical range of *A. germari*, it was found more appropriate to consider the former species, *A. parvigranula,* as a subspecies of *A. germari* (to be called *A. germari* ssp. *parvigranula*). The geographical distribution of *A. germari* is given as follows:
Asia: Bangladesh, Bhutan, Cambodia (*A. germari* ssp. *parvigranula*), China (*A. germari* ssp. *parvigranula* - Hainan and Yunnan), India, Laos (*A. germari* ssp. *parvigranula*), Myanmar (*A. germari* ssp. *parvigranula*), Nepal, Thailand (*A. germari* ssp. *parvigranula* - Northern part), Vietnam (*A. germari* ssp. *parvigranula*).

- ***Apriona rugicollis***

A. rugicollis is considered to be a distinct species and is synonymized with *A. japonica, A. gressitti* and *A. plicicollis*. The creation of two subspecies: *A. rugicollis* ssp. *nobuoi* (= *A. japonica* ssp. *nobuoi* - present in Okinawa, Japan) and *A. rugicollis* ssp. *yayeyamai* (= *A. yayeyama* - present in Ishigakishima island, Ryukyu archipelago, Japan) is also proposed.
The geographical distribution of *A. rugicollis* is given as follows:
Asia: China (Anhui, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Qinghai, Shandong, Sichuan, Xizhang, Zhejiang), Japan, Korea (Democratic People's Republic of), Korea (Republic of), Taiwan.

- ***Apriona cinerea***

A. cinerea (=*A. newcombei*) remains a distinct species with the following geographical distribution:
Asia: India (Uttar Pradesh), Pakistan.

Source: Jiroux E (2011) Révision du genre *Apriona* Chevrolat 1852 (Coleoptera, Cerambycidae, Lamiinae, Batocerini). *Les cahiers Magellanes* (NS) **5**, 1-103.

Correspondance with Anses Plant Health Laboratory, Montferrier-sur-Lez, France (2014-07).

Additional key words: taxonomy **Computer codes:** APRICI, APRIGE, APRIJA

2015/111 Surveys on *Hop stunt viroid* on hops in Slovenia and detection of an unexpected pathogen: *Citrus bark cracking viroid*

In 2007, symptoms resembling those of *Hop stunt viroid* (*Pospiviroidae*, HSVd) were observed for the first time in Slovenia in hop (*Humulus lupulus*) gardens in the Savinja valley and Koroška region. Molecular tests (RT-PCR, sequencing, hybridization) confirmed the presence of HSVd in symptomatic plants in 2011 (see EPPO RS 2012/055). Affected hop plants showed shortened internodes of the main and lateral branches resulting in a general plant stunting, leaf yellowing and downward curling, and a reduced cone production.

Since 2011, official measures have been adopted in Slovenia to prevent any further spread of the disease. Systematic surveys have been carried out on a yearly basis and included visual inspections of hop gardens, sampling, laboratory analysis and expert support to growers. Despite the identification of HSVd in symptomatic plants, the disease observed in Slovenia on hop presented some unusual characteristics. The incubation period of HSVd which is observed in Japan before the expression of symptoms ranges from 3 to 5 years, whereas in Slovenia, severe symptoms already appear during the first year of contamination. In addition, RT-PCR detection of HSVd was found to be unreliable (except when using cones) which was considered unusual for a systemic pathogen causing such severe symptoms. Further investigations using next generation sequencing analysis (NGS) revealed the presence of another viroid, *Citrus bark cracking viroid* (*Pospiviroidae*, CBCVd), in symptomatic hop plants. Until this finding, CBCVd had only been described as a minor pathogen of citrus plants. Infection tests using a biolistic inoculation technique proved the high aggressiveness and infectivity of CBCVd on hop. On the basis of the latter and on the results of NGS and RT-PCR testing of samples from all infected hop gardens, CBCVd was recognized as the causal agent of this new viroid disease of hop, called 'severe hop stunt disease'.

Results of the systematic surveys revealed the presence of HSVd in 1 sample out of a total of 59 samples in 2012. In 2013 and 2014, HSVd was not detected in any sample. In contrast, the analysis of all samples taken from symptomatic plants (regardless of the sampling year) revealed the presence of CBCVd. Although it became clear that HSVd was not the causal agent of the disease observed on hop in Slovenia, its presence in symptomatic plants remains to be explained. Systematic surveys showed that the majority of CBCVd outbreaks occurred near the initial outbreak site in Šempeter (Savinja valley) which is located in the main hop-growing region in Slovenia. CBCVd infections were also detected in 2 hop gardens in Koroška region near Slovenj Gradec, and in Polskava near Slovenska Bistrica. Although HSVd is not the causal agent of the 'severe hop stunt disease', the Slovenian NPPO considered that its presence on hop and its potential pathogenicity still required phytosanitary measures. Therefore, strict official measures are currently implemented to prevent any further spread and to eradicate both HSVd and CBCVd.

The pest status of *Hop stunt viroid* in Slovenia is officially declared as: **Present, under eradication.**

The pest status of *Citrus bark cracking viroid* in Slovenia is officially declared as: **Present: only in some areas where hop is grown and under eradication.**

Source: NPPO of Slovenia (2015-06).

INTERNET
Phytosanitary Administration of the Republic of Slovenia.
Archive on HSVd.

http://www.arhiv.fu.gov.si/en/services_and_measures/regulated_organisms/hop_stunt_viroid/index.html
Hop stunt viroid – HSVD and Citrus bark cracking viroid – CBCVd (in Slovenian)
http://www.uvhvvr.gov.si/si/delovna_podrocja/zdravje_rastlin/karantenski_skodljivi_organizmi/posebno_nadzorovani_organizmi/viroidna_zakrnelost_hmelja/

Additional key words: new record, detailed record, new host plant

Computer codes: CBCVD0, HSVD00, SI

2015/112 *Citrus bark cracking viroid* is causing 'severe hop stunt disease' in Slovenia: addition to the EPPO Alert List

Because the presence of *Citrus bark cracking viroid* has recently been discovered in Slovenia and shown to be causing a severe disease on hop (*Humulus lupulus*), a new host for this viroid, the NPPO of Slovenia suggested the addition of CBCVd to the EPPO Alert List and kindly drafted the text below. The NPPO also provided very useful pictures of CBCVd symptoms on hop which can be viewed in EPPO Global Database.

Citrus bark cracking viroid: causing a severe disease on a new host, hop (*Humulus lupulus*)
Why: an unknown and severe disease was observed in 2007 in hop gardens in Slovenia. The disease spread extremely rapidly and caused severe stunting and death of affected plants. Screening studies on all known pathogens of hop, revealed the presence of *Hop stunt viroid* (*Pospiviroidae*, HSVd - hop stunt disease). However, the new disease observed in Slovenia presented some unusual characteristics for HSVd, such as shorter incubation period, higher aggressiveness, and unreliabily of RT-PCR detection (limited to hop cone tissues). Further analysis of symptomatic plants using next generation sequencing (NGS) analysis revealed the presence of *Citrus bark cracking viroid* (*Pospiviroidae*, CBCVd). Until this finding, CBCVd had been described only as a minor pathogen of citrus plants. Research studies confirmed that CBCVd was the causal agent of this new viroid disease of hop, which was called 'severe hop stunt disease'. Hop is a new and highly susceptible host for CBCVd. Because CBCVd on hop is causing a new and emerging disease in the EPPO region, the NPPO of Slovenia suggested its addition to the EPPO Alert List.

Where: CBCVd (formerly named Citrus viroid IV) was first identified in 1988 during citrus exocortis disease studies, in samples originating from California (US). Three years later, the first CBCVd nucleotide sequence was established from dwarfed grapefruit in Israel. Before outbreaks on hop in Slovenia, CBCVd was described as a minor pathogen of citrus species with limited occurrence, even in countries with citrus fruit production. CBCVd outbreaks on hop are currently present only in Slovenia, where strict eradication measures have been established.
EPPO region: Greece, Italy, Israel, Tunisia (all on *Citrus* spp.) and Slovenia (severe outbreaks on *Humulus lupulus*; under eradication).
Africa: South Africa, Sudan and Tunisia (on *Citrus* spp.).
Asia: China, Israel, Iran and Japan (on *Citrus* spp.).
North America: USA (California, Texas) (on *Citrus* spp.).

On which plants: the main hosts are citrus (*Citrus* spp., *Poncirus trifoliata*) and, since its discovery in Slovenia, also hop (*Humulus lupulus*). Artificial inoculations showed that some citrus-related plants from the Rutaceae family (*Fortunella margarita*; *F. crassifolia; F. obovata*, *Microcitrus warburgiana; M. australis x M. australasica*, *Pleiosperum sp.* and *Severinia buxifolia*) and other viroid indicator plants (*Cucumis sativus, Benincasa hispida,* *Solanum lycopersicum, Solanum melongena, Chrysanthemum morifolium*) could be symptomless hosts of CBCVd.

Damage: CBCVd is a minor pathogen on citrus, and is associated with bark cracking in trifoliate orange (*Poncirus trifoliata*). The appearance of this symptom was why Citrus viroid IV was given the more descriptive name of *Citrus bark cracking viroid*. Studies have demonstrated that CBCVd does not have a negative effect on growth and yield in citrus. However, in trees co-infected with HSVd, a synergistic effect has been observed that reduces the yield. Several surveys in citrus orchards have shown that CBCVd is the least widespread of the citrus viroids and usually occurs in combination with other citrus viroids. In contrast with the observations on citrus, CBCVd causes severe symptoms on hop, which include plant stunting resulting from a shortening of the internodes of main and lateral branches, leaf yellowing and downward curling, reduced cone production, and dry root rot. The first symptoms appear 4-12 months after infection and plants die within 3-5 years. Since hop is a perennial plant, which requires an extensive and long term support system for cultivation, infections of hop gardens have a high impact on production and cause major economic damage.

Transmission: CBCVd is sap-transmissible and therefore, it can be transmitted by vegetative propagation, grafting, foliar contact between neighboring plants, contaminated tools and machinery, clothing and human hands. Surveys on citrus have demonstrated a relatively low incidence and progression in commercial orchards. In contrast to citrus, CBCVd progresses rapidly (up to 20% every year) in affected hop gardens, mainly along plant rows. In hop production, returning fresh hop waste from CBCVd infected hop gardens after harvest into non-infected hop gardens represents a high risk of further spreading the disease. There are no reports of seed or pest transmission; however, additional studies should be done in the future. Hop growing is based on the cultivation of female plants, which are not pollinated, so seeds are present in a very small proportion. Seeds in hop and citrus production are important only for breeding new varieties. Over long distances, CBCVd can be transmitted by infected planting material or parts of plants. The CBCVd emergence on hop is still unclear, since citrus are not grown commercially in Slovenia. It is assumed that CBCVd transmission to hop occurred from the remains of imported citrus fruits or plants. The initial outbreak took place in a hop garden established on the site of a former waste dump, where such transmission probably happened. However, this hypothesis about possible transmission of CBCVd from infected citrus fruits to hop remains to be verified.

Pathway: plants for planting, parts of plants, citrus fruits, contaminated machinery from areas in which CBCVd occurs.

Possible risks: CBCVd is a minor pathogen on citrus, but on hop it can cause severe economic damage. Hop is a perennial climbing plant cultivated for the production of female inflorescences (cones), which are primarily used in the production of beer to provide bitterness and aroma. Hops are also used in herbal medicine and in the pharmaceutical industry. It is an important crop that is traditionally grown in some countries of the EPPO region and the rest of the world (USA is the biggest producer). In the EPPO region, hop is grown on more than 25 000 ha in 13 countries, of which Germany, the Czech Republic, the United Kingdom, Poland and Slovenia provide the majority of European hop production. CBCVd outbreaks in Slovenia represent a high risk for national, European and world hop production. With the aim of eradication and suppression, Slovenia has established an eradication program which includes a systematic monitoring programme and the introduction of viroid testing in the certification of hop planting material.

Sources

Bernard L, Duran-Vila N (2006) A novel RT-PCR approach for detection and characterization of citrus viroids. *Molecular and Cellular Probes* **20**, 105-113.
Cao MJ, Liu YQ, Wang XF, Yang FY, Zhou CY (2010) First report of *Citrus bark cracking viroid* and *Citrus viroid V* infecting Citrus in China. *Plant Disease* **94**(7), p 922.
Cook G, van Vuuren SP, Breytenbach JHJ, Manicom BQ (2012) *Citrus Viroid IV* detected in *Citrus sinensis* and *C. reticulata* in South Africa. *Plant Disease* **96**(5), p 772.
Duran-Vila N, Roistacher CN, Rivera-Bustamante R, Semancik JS (1988) A definition of citrus viroid groups and their relationship to the exocortis disease. *Journal of General Virology* **69**, 3069–3080.
Duran-Vila N, Semancik JS (2003) Citrus viroids. In: Hadidi A, Flores R, Randles JW, Semancik JS, eds. Viroids. CSIRO Publishing, Collingwood, Australia, 178-194.
Eastwell KC, Sano T (2009) Hop Stunt. In: MahaffeeWF, Pethybridge SJ, Gent DH, eds. *Compendium of Hop Diseases and Pests*. APS, St. Paul, MN, 48-50.
Hashemian SMB, Taheri H, Alian YM, Bové JM, Duran-Vila N (2013) Complex mixtures of viroids identified in the two main citrus growing areas of Iran. *Journal of Plant Pathology* **95**(3), 647-654.
IHGC (2014) International Hop Growers Convention, Economic Commission Summary Reports. http://www.hmelj-giz.si/ihgc/obj.htm
Ito T, Ieki H, Ozaki K, Iwanami T, Nakahara K, Hataya T, Ito T, Isaka M, Kano T (2002) Multiple citrus viroids in citrus from Japan and their ability to produce exocortis-like symptoms in citron. *Phytopathology* **92**, 542-547.
Jakše J, Radisek S, Pokorn T, Moatoušek J, Javornik B (2014) Deep-sequencing revealed a CBCVd viroid as a new and highly aggressive pathogen on hop. *Plant Pathology* doi: 10.1111/ppa.12325
Kunta M, Da Graca JV, Skaria M (2007) Molecular detection and prevalence of citrus viroids in Texas. *HortScience* **42**, 600-604.
Malfitano M, Barone M, Alioto D, Duran-Vila N (2005) A survey of citrus viroids in Campania (Southern Italy). *Plant Disease* **89**(4), p 434
Mohamed ME, Bani Hashemian SM, Dafalla G, Bové JM, Duran-Vila N (2009) Occurrence and identification of citrus viroids from Sudan. *Journal of Plant Pathology* **91**(1), 185-190.
Najar A, Duran-Vila N (2004) Viroid prevalence in Tunisian citrus. *Plant Disease* **88**, p 1286.
NPPO of Slovenia (2015-06).
Önelge N, Kersting U, Guang Y, Bar-Joseph M, Bozan O (2000) Nucleotide sequence of citrus viroids CVd IIIa and CVd IV obtained from dwarfed Meyer lemon trees grafted on sour orange. *Journal of Plant Disease and Protection* **107**, 387-391.
Pagliano G, Peyrou M, Del Campo R, Orlando L, Gravina A, Wettstein R, Francis M (2000) Detection and characterizationof citrus viroids in Uruguay. In: J Gracxa JV, Lee RF, Yokomi RK, eds. Proceedings of the 14th Conference of the International Organisation Citrus Virologists, IOCV, Riverside, California, 282–288.
Puchta H, Ramm K, Luckinger R, Hadas R, Barjoseph M, Sanger HL (1991) Primary and secondary structure of citrus viroid-iv (CVd-IV), a new chimeric viroid present in dwarfed grapefruit in Israel. *Nucleic Acids Research* **19**, 6640.
Radisek S, Majer A, Jakse J, Javornik B, Matoušek J (2012) First report of *Hop stunt viroid* infecting hop in Slovenia. *Plant Disease* **96**(4), p 592.
Sano T (2003) *Hop stunt viroid*. In: Hadidi A, Flores R, Randles JW, Semancik JS, eds. Viroids. CSIRO Publishing, Collingwood, Australia, 207-212.
Semancik JS, Vidalakis G (2005) The question of Citrus viroid IV as a Cocadviroid. *Archives of Virology* **150**, 1059–1067.
Vernière C, Perrier X, Dubois C, Dubois A, Botella L, Chabrier C, Bové JM, Duran Vila N (2004). Citrus viroids: symptom expression and effect on vegetative growth and yield of clementine trees grafted on trifoliate orange. *Plant Disease* **88**, 1189–97.
Vernière C, Perrier X, Dubois C, Dubois A, Botella L, Chabrier C, Bové JM, Duran-Vila N (2006) Interactions between citrus viroids affect symptom expression and field performance of clementine trees grafted on trifoliate orange. *Phytopathology* **96**, 356–68.
Wang J, Boubourakas IN, Voloudakis AE, Agorastou T, Magrimpis G, Rucker TL, Kyriakopoulou PE, Vidalakis G (2013) Identification and characterization of known and novel viroid variants in the Greek national citrus germplasm collection: threats to the industry. *European Journal of Plant Pathology* **137**, 17-27.

EPPO RS 2015/112
Panel review date - Entry date 2015-06

Additional key words: Alert List **Computer codes:** CBCVD0, SI

2015/113 First report of *Groundnut ringspot virus* in Finland

The NPPO of Finland recently informed the EPPO Secretariat of the detection of *Groundnut ringspot virus* (*Tospovirus*, GRSV) on its territory. Following an official phytosanitary inspection carried out in 2015-03-31, the presence of GRSV was detected on 2015-05-07 in a commercial crop of potted *Begonia* spp. plants in Rovaniemi (Northern Finland). In the greenhouse concerned, only a few plants showed symptoms. Laboratory analysis (RT-PCR, sequencing, DAS-ELISA) confirmed the identity the virus. The origin of this infection is unknown but it is likely that the virus has been introduced with imported planting material. Eradication measures were immediately implemented: destruction of all symptomatic plants and control of the thrips vector (*Frankliniella occidentalis*).
The pest status of *Groundnut ringspot virus* in Finland is officially declared as: **Present, under eradication.**

EPPO note: according to the literature, GRSV was first described in 1999 from samples of peanut (*Arachis hypogaea* - Fabaceae) from South Africa and Brazil. This virus mainly infects Cucurbitaceae (*Citrullus lanatus, Cucumis sativus*) and Solanaceae (*Capsicum* spp., *Nicotiana tabacum, Solanum lycopersicum, S. melongena*), but it has also been detected in other cultivated plants or weeds belonging to different plant families. GRSV is transmitted by thrips (i.e. *Frankliniella occidentalis, F. schultzei* and *F. gemina*). Prior to this first record in Finland, GRSV was only known to occur in the Americas (Argentina, Brazil and USA) and South Africa. A tentative distribution list can be found in the EPPO Global Database: https://gd.eppo.int/taxon/GRSV00/distribution

Source: NPPO of Finland (2015-05).

Additional key words: new record **Computer codes:** GRSV00, FI

2015/114 *Tomato leaf curl New Delhi virus*: addition to the EPPO Alert List

Why: *Tomato leaf curl New Delhi virus* (ToLCNDV) is a bipartite, whitefly-transmitted, begomovirus which was first described on tomatoes in India in 1995 (initially as ToLCV-India). This virus was initially reported on solanaceous crops, but subsequently many reports of damage to cucurbit crops were also made. Following its discovery in India, other Asian countries reported the occurrence of ToLCNDV on a rather wide range of crops. In September 2012, symptoms caused by ToLCNDV were first observed on courgette (*Cucurbita pepo* var. *giromontiina*) in Murcia, Spain. In May 2013, similar symptoms were noticed in Almería province, and by autumn 2013, the disease was widespread in both Spanish regions. In January 2015, the virus was detected for the first time in Tunisia, causing a severe disease on melon, cucumber and courgette cultivated under plastic tunnels in the Kébili region (Southeastern Tunisia). As ToLCNDV is an emerging virus in the Euro-Mediterranean region, the EPPO Secretariat decided to add it to the EPPO Alert List.

Where: information is generally lacking on the geographical distribution, which might be wider than what is listed below.
EPPO region: Spain (first found in autumn 2012), Tunisia (first found in January 2015).
Asia: Bangladesh, India (Andhra Pradesh, Delhi, Gujarat, Haryana, Maharashtra, Punjab, Uttar Pradesh, West Bengal), Indonesia (Java), Pakistan, Philippines, Sri Lanka, Taiwan, Thailand.

On which plants: ToLCNDV was initially found on *Solanum lycopersicum* (tomato), and then on other Solanaceae such as *Solanum melongena* (aubergine), chili pepper (*Capsicum* spp.) and *Solanum tuberosum* (potato). ToLCNDV was also found to infect many Cucurbitaceae, such as: *Benincasa hispida* (wax gourd), *Citrullus lanatus* (watermelon), *Cucumis melo* (melon), *Cucumis melo* var. *flexuosus* (snake melon), *Cucumis sativus* (cucumber), *Cucurbita moschata* (musky gourd), *Cucurbita pepo* (pumpkin), *Cucurbita pepo* var. *giromontiina* (courgette), *Lagenaria siceraria* (bottle gourd), *Luffa cylindrica* (sponge gourd), *Momordica charantia* (bitter gourd). In Spain, the virus was detected in melon (*Cucurbita melo, C. melo* var. *flexuosus*), pumpkin (*C. pepo*) and cucumber (*Cucumis sativus*) crops, but apparently not in tomato. In Tunisia, ToLCNDV was also found only in cucurbit crops. In the literature, there are a few records on weeds (e.g. *Eclipta prostrata* – Asteraceae) and other crops such as *Hibiscus cannabinus* (kenaf – Malvaceae) and *Carica papaya* (papaya - Caricaceae).

Damage: diseases caused by ToLCNDV on its different host plants generally include yellow mosaic, leaf curling, vein swelling, and plant stunting. On cucurbit fruits, skin roughness and longitudinal cracking have been observed. On fruiting crops, when the virus infection occurs at an early stage, affected plants are severely stunted and fruit production is significantly affected, if not supressed. In the Indian sub-continent, ToLCNDV is reported to cause severe symptoms and economic losses, in particular in solanaceous crops (e.g. tomato, aubergine, chili pepper). Surveys conducted in India from 2003 to 2010, confirmed its occurrence in several cucurbit crops associated with damage.

Transmission: ToLCNDV is transmitted by *Bemisia tabaci* in a persistent mode. It is not known if the virus can be transmitted by contact or by seeds.

Pathway: plants for planting of susceptible hosts, viruliferous *B. tabaci*.

Possible risks: ToLCNDV has a wide host range which includes economically important crops for the EPPO region, such as tomato, aubergine, capsicum, potato and cucurbits. ToLCNDV shows genetic variability and several strains have been described, which might explain the differences in host plants affected between regions. In addition, molecular studies have shown that the presence or absence of beta-satellites might affect its pathogenicity. Control measures against ToLCNDV are very limited and mainly rely on whitefly control, cultivation under insect-proof greenhouses, elimination of infected plants, and avoidance of the most susceptible cultivars. It should be noted that for the moment, no resistance or tolerance to ToLCNDV has been identified in commercial cultivars. The introduction of this virus into Spain has raised serious concerns among cucurbit growers, and compulsory control measures were issued by the region of Murcia. Although more studies are needed to better understand the biology and epidemiology of this virus, it seems desirable to avoid its further spread.

Sources
Chang HH, Chien RC, Tsai WH, Jan FJ (2009) Molecular and biological characterization of a mechanically transmissible *Tomato leaf curl New Delhi virus* infecting oriental melon plants.

Poster presented at the APS 2009 Annual Meeting (Portland, US, 2009-08-01). http://research.nchu.edu.tw/upfiles/ADUpload/oc_downmul2305443785.pdf

Font Sant Ambrosio MA, Alfaro Fernándes AO (2014) Sintomatología del virus del rizado de tomate de Nueva Delhi (*Tomato leaf curl New Delhi virus*, ToLCNDV) en los cultivos españoles. *Phytoma-España* no. 257, 36-40.

Haier Ms, Tahir M, Latfi S, Briddon RW (2005) First report of *Tomato leaf curl New Delhi virus* infecting *Eclipta prostrata* in Pakistan. *New Disease Reports* **11**, 39 http://www.ndrs.org.uk/article.php?id=011039

Hussain M, Mansoor S, Iram S, Zafar Y, Briddon RW (2000) First report of Tomato leaf curl New Delhi virus affecting chilli pepper in Pakistan. *New Disease Reports* **9**, 20 http://www.ndrs.org.uk/article.php?id=009020

Ito T, Sharma P, Kittipakorn K, Ikegami M (2008) Complete nucleotide sequence of a new isolate of *Tomato leaf curl New Delhi virus* infecting cucumber, bottle gourd and muskmelon in Thailand. Archives of Virology 153(3), 611-613.

Juárez M, Tovar R, Fiallo-Olivé E, Aranda MA, Gosálvez B, Castillo P, Moriones E, Navas-Castillo J (2014) First detection of *Tomato leaf curl New Delhi virus* infecting zucchini in Spain. *Plant Disease* **98**(6), p 857.

Jyothsna P, Haq QMI, Singh P, Sumiya KV, Praveen S, Rawat R, Briddon RW, Malathi VG (2013) Infection of *Tomato leaf curl New Delhi virus* (ToLCNDV), a bipartite begomovirus with betasatellites, results in enhanced level of helper virus components and antagonistic interaction between DNA B and betasatellites. *Applied Genetics and Molecular Biotechnology* **97**, 5457-5471.

Khan MS, Raj SK, Singh R (2005) First report of *Tomato leaf curl New Delhi virus* infecting chilli in India. *New Disease Reports* **11**, 41 http://www.ndrs.org.uk/article.php?id=011041

Mizutani T, Daryono BS, Ikegami M, Natsuaki KT (2001) First report of T*omato leaf curl New Delhi virus* infecting cucumber in Central Java, Indonesia. *Plant Disease* **95**(11), p 1485.

Mnari-Hattab M, Zammouri S, Belkadhi MS, Bellon Doña D, Ben Nahia E, Hajlaoui MR (2015) First report of *Tomato leaf curl New Delhi virus* infecting cucurbits in Tunisia. *New Disease Reports* **31**, 21. http://dx.doi.org/10.5197/j.2044-0588.2015.031.021

Padidam MRN, Beachy, Fauquet CM (1995) Tomato leaf curl geminivirus from India has a bipartite genome and coat protein is not essential for infectivity. Journal of General Virology 76, 25-35.

Phaneendra C, Rao KRSS, Jain RK, Mandal B (2012) *Tomato leaf curl New Delhi virus* is associated with pumpkin leaf curl: a new disease in Northern India. *Indian Journal of Virology* **23**(1), 42-45.

Pratap D, Kashikar AR, Mukherjee SK (2011) Molecular characterization and infectivity of a *Tomato leaf curl New Delhi virus* variant associated with newly emerging yellow mosaic disease of eggplant in India. *Virology Journal* **8**(305) http://www.virologyj.com/content/8/1/305

Roy A, Spoorthi P, Panwar G, Kumar Bag M, Prasad TV, Kumar G, Gangopadhyay KK, Dutta M (2013) Molecular evidence for occurrence of *Tomato leaf curl New Delhi virus* in ash gourd (*Benincasa hispida*) germplasm showing a severe yellow stunt disease in India. *Indian Journal of Virology* **24**(1), 74-77.

Ruiz ML, Simón A, Velasco L, García MC, Janssen D (2015) First report of *Tomato leaf curl New Delhi virus* infecting tomato in Spain. *Plant Disease* http://dx.doi.org/10.1094/PDIS-10-14-1072-PDN

Sohrab SS, Mandal B, Pant RP, Varma A (2003) First report of association of *Tomato leaf curl New Delhi virus* with the yellow mosaic disease of *Luffa cylindrica. Plant Disease* **87**(9), p 1148.

Sorab SS, Karim S, Varma A, Azhar EI, Mandal B, Abuzenadah AM, Chaudhary AG (2013) Factors affecting sap transmission of Tomato leaf curl New Delhi begomovirus infecting sponge gourd in India. *Phytoparasitica* **41**, 591-592.

Tahir M, Haider MS (2005) First report of *Tomato leaf curl New Delhi virus* infecting bitter gourd in Pakistan. *New Disease Reports* **10**, 50 http://www.ndrs.org.uk/article.php?id=010050

Tiwari AK, Sharma PK, Khan MS, Snehi SK, Raj SK, Rao GP (2010) Molecular detection and identification of *Tomato leaf curl New Delhi virus* isolate causing yellow mosaic disease in bitter gourd (*Momordica charantia*), a medicinally important plant in India. *Medicinal Plants* **2**(2), 117-123.

Usharani KS, Surendranath B, Paul-Khurana SM, Garg ID, Malathi VG (2003) Potato leaf curl - a new disease of potato in northern India caused by a strain of *Tomato leaf curl New Delhi virus. New Disease Reports* **8**, 2 http://www.ndrs.org.uk/article.php?id=008002

EPPO RS 2015/114
Panel review date -
Entry date 2015-06

Additional key words: Alert List **Computer codes:** TOLCND

2015/115 Incursions of '*Candidatus* Liberibacter asiaticus' in Argentina

During recent routine surveys, several incursions of '*Candidatus* Liberibacter asiaticus' (associated with huanglongbing – EPPO A1 List) have been reported in Argentina, all in the province of Corrientes. In 2014, '*Ca*. L. asiaticus' was detected in 1 citrus plant growing in an orchard in the area of Mocoretá (departamento Monte Caseros). In 2015, the bacterium was found in 1 citrus plant at a private residence in the locality of Wanda (departamento Puerto Iguazú). More recently, the pathogen was detected in 3 citrus plants collected from commercial orchards in the departamento General Manuel Belgrano, and in 5 plants growing in a private residence near Puerto Iguazú. In all cases, infected plants have been destroyed and additional intensive surveys carried out in their surroundings did not detect other positive cases.
The situation of '*Candidatus* Liberibacter asiaticus' in Argentina can be described as: **Absent, eradicated.**

Source: INTERNET
SENASA (2015-06-02) Misiones: erradicación de plantas positivas a la presencia del HLB en Puerto Iguazú y General Belgrano.
http://www.senasa.gov.ar/contenido.php?to=n&in=1897&ino=0&io=30513

SENASA (2015-03-20) Misiones: el Senasa erradicó una planta con HLB del patio de un domicilio en la localidad de Wanda.
http://www.senasa.gov.ar/contenido.php?to=n&in=&io=29993

SENASA (2014-08-20) HLB: el Senasa continúa sus monitoreos en Monte Caseros, Corrientes. http://www.senasa.gov.ar/contenido.php?to=n&in=11&ino=11&io=28302

Additional key words: absence, incursion, eradication **Computer codes:** LIBEAS, AR

2015/116 Results of the 2014 surveys on *Ralstonia solanacearum* and *Clavibacter michiganensis* subsp*. sepedonicus* in Latvia

The official surveys for potato bacteria which were conducted in 2014 in Latvia confirmed the absence of *Ralstonia solanacearum* (EPPO A2 List) and the limited distribution of *Clavibacter michiganensis* subsp*. sepedonicus* (EPPO A2 List). All farms producing certified seed potatoes were surveyed, and all potato lots were visually inspected and sampled. Approximately 25% of the registered ware potato farms (as well as farms producing potatoes for industrial purposes) were surveyed, and all potato lots were inspected and sampled. *C. michiganensis* subsp*. sepedonicus* was detected in the following regions: Kurzeme (7 cases), Zemgale (2 cases), Latgale (3 cases), Vidzeme (2 cases), Riga (2 cases); the total infected area is estimated to cover approximately 32 ha.
The situation of *Ralstonia solanacearum* in Latvia can be described as follows: **Absent, confirmed by survey.**
The situation of *Clavibacter michiganensis* subsp*. sepedonicus* in Latvia can be described as follows: **Present, restricted distribution, under official control.**

Source: NPPO of Latvia (2015-06).

Additional key words: absence, detailed record **Computer codes:** CORBSE, RALSSO, LV

2015/117 Results of the 2014 survey on *Ralstonia solanacearum* and *Clavibacter michiganensis* subsp. *sepedonicus* in Lithuania

The official survey for potato bacteria which was conducted in 2014 in Lithuania confirmed the absence of *Ralstonia solanacearum* (EPPO A2 List) and the limited distribution of *Clavibacter michiganensis* subsp. *sepedonicus* (EPPO A2 List). During this survey: 6 seed potato and 620 ware potato farms were inspected; 153 seed potato samples (corresponding to 46 lots) and 847 ware potato samples (683 lots) were tested. As a result, 28 samples (21 lots from 21 farms) of ware potatoes were found infected by *Clavibacter michiganensis* subsp. *sepedonicus*. The bacterium was not detected in seed potatoes. The 21 infected farms were located in the regions of Alytus, Kaunas, Klaipėda, Marijampolė, Panevėžys, Šiauliai, Telšiai, Utena and Vilnius. The total infested area is estimated at approximately 72 ha. All contaminated ware potatoes were destroyed by burial or used for animal feed after steaming.
The situation of *Ralstonia solanacearum* in Lithuania can be described as follows: **Absent, confirmed by survey.**
The situation of *Clavibacter michiganensis* subsp. *sepedonicus* in Lithuania can be described as follows: **Present, restricted distribution, under official control.**

Source: NPPO of Lithuania (2015-06).

Additional key words: absence, detailed record **Computer codes:** CORBSE, RALSSO, LT

2015/118 Phytoplasma classification

Phytoplasmas are a large group of wall-less, non-helical bacteria, associated with plant diseases. They have been found in more than 1 000 plant species on all continents and some of their associated diseases are of major economic importance. In addition, several of them are regulated pests. As attempts to culture phytoplasmas in artificial growing media have failed so far, their study and taxonomic classification is difficult. Phytoplasmas are currently classified within the provisional genus '*Candidatus* Phytoplasma' based primarily on 16S rRNA sequence analysis. Some less conserved genes have also been used to further differentiate closely related strains or variants within a given strain, which is of particular importance when differences are observed in pathogenicity or ecology in the field. The current '*Candidatus* Phytoplasma' species classification is based on the 16S rRNA gene sequence, and a threshold of 97.5% similarity with any previously described species is used to propose any new species. During the last decade, the number of phytoplasma strains reported worldwide has increased exponentially. In order to classify phytoplasmas more rapidly, an alternative approach has been taken with the development of an online tool (iPhyClassifier). With this computerized system which simulates an RFLP analysis, researchers can affiliate a new sequence of a phytoplasma strain to a 16Sr group and subgroup. With this system, the phytoplasma classification has been largely expanded and updated, and more than 30 groups and 100 subgroups have been obtained. Updated classifications have been published in recent reviews (Marcone, 2014; Fránová *et al*., 2014). The table below shows the currently proposed '*Candidatus* Phytoplasma species' but a fuller list of phytoplasma strains with their 16Sr group/subgroup can be found in Fránová *et al*. (2014).

'*Candidatus* Phytoplasma species'	Associated diseases	16Sr group-subgroup	Genbank nb
'*Ca*. Phytoplasma allocasuarinae'	Allocasuarina yellows	XXXIII-A	AY135523
'Ca. Phytoplasma americanum'	Potato purple top wilt	XVIII-A	DQ174122
'*Ca*. Phytoplasma asteris'	Aster yellows	I-B	M30790
'*Ca*. Phytoplasma aurantifolia'	Lime witches' broom	II-B	U15442
'*Ca*. Phytoplasma australasia'*	Papaya dieback	II-D	Y10096
'*Ca*. Phytoplasma australiense'	Australian grapevine yellows	XII-B	L76865
'*Ca*. Phytoplasma balanitae'	Balanites witches' broom	V-F	AB689678
'*Ca*. Phytoplasma brasiliense'	Hibiscus witches' broom	XV-A	AF147708
'*Ca*. Phytoplasma caricae'*	Papaya bunchy top	XVII-A	AY725234
'*Ca*. Phytoplasma castaneae'	Chestnut witches' broom	XIX-A	AB054986
'*Ca*. Phytoplasma convolvuli'	Bindweed yellows	XII-H	JN833705
'*Ca*. Phytoplasma costaricanum'	Soybean stunt	XXXI-A	HQ225630
'*Ca*. Phytoplasma cynodontis'	Bermuda grass white leaf	XIV-A	AJ550984
'*Ca*. Phytoplasma fragariae'	Strawberry yellows	XII-E	DQ086423
'*Ca*. Phytoplasma fraxini'	Ash yellows	VII-A	AF092209
'*Ca*. Phytoplasma graminis'	Sugarcane yellow leaf	XVI-A	AY725228
'*Ca*. Phytoplasma japonicum'	Japanese hydrangea phyllody	XII-D	AB010425
'*Ca*. Phytoplasma lycopersici'	'Brote grande'	I-Y	EF199549
'*Ca*. Phytoplasma malaysianum'	Periwinkle virescence and phyllody	XXXII-A	EU371934
'*Ca*. Phytoplasma mali'	Apple proliferation	X-A	AJ542541
'*Ca*. Phytoplasma omanense'	Cassia witches' broom	XXIX-A	EF666051
'*Ca*. Phytoplasma oryzae'	Rice yellow dwarf	XI-A	AB052873
'*Ca*. Phytoplasma palmicola'*	Coconut lethal yellowing (Mozambique)	XXII-A	KF751387
'*Ca*. Phytoplasma phoenicium'	Almond witches' broom	IX-B	AF515636
'*Ca*. Phytoplasma pini'	Pine shoot proliferation	XXI-A	AJ310849
'*Ca*. Phytoplasma pruni'	Peach X-disease	III-A	JQ044392/JQ044393
'*Ca*. Phytoplasma prunorum'	European stone fruit yellows	X-B	AJ542544
'*Ca*. Phytoplasma pyri'	Pear decline	X-C	AJ542543
'*Ca*. Phytoplasma rhamni'	Buckthorn witches' broom	XX-A	AJ583009
'*Ca*. Phytoplasma rubi'	Rubus stunt	V-E	AY197648
'*Ca*. Phytoplasma solani'	Stolbur	XII-A	AF248959
'*Ca*. Phytoplasma spartii'	Spartium witches' broom	X-D	X92869
'*Ca*. Phytoplasma sudamericanum'	Passionfruit witches' broom	VI-I	GU292081
'*Ca*. Phytoplasma tamaricis'	Salt cedar witches' broom	XXX-A	FJ432664
'*Ca*. Phytoplasma trifolii'	Clover proliferation	VI-A	AY390261
'*Ca*. Phytoplasma ulmi'	Elm yellows	V-A	AY197655
'*Ca*. Phytoplasma ziziphi'	Jujube witches' broom	V-B	AB052876

* Included in the review from Marcone (2014) and in LPSN website, but not in Fránová *et al.* (2014).

The following names have been proposed in the literature but without being accompanied by a valid description.

Names	Associated diseases	16Sr group-subgroup
[*Ca*. Phytoplasma cocosnigeriae]	Nigerian awka disease	XXII-A
[*Ca*. Phytoplasma cocostanzaniae]	Coconut lethal yellowing (Tanzania)	IV-C

[*Ca*. Phytoplasma luffae]	Loofah witches' broom	VIII-A
[Ca. Phytoplasma palmae]	Palm lethal yellowing	IV-A
[*Ca*. Phytoplasma vitis]	Grapevine flavescence dorée	V-C

Useful websites on phytoplasmas
- International Phytoplasmologist Working Group. http://www.ipwgnet.org/
- LPSN – bacterio.net. List of prokaryotic names with standing in nomenclature. Some names included in the category Candidatus (Taxonomic category not covered by the Rules of the Bacteriological Code) http://www.bacterio.net/-candidatus.html
- Phytoplasma resources Center and iPhyClassifier.
  http://plantpathology.ba.ars.usda.gov/pclass/pclass_phytoplasmaclassification_system2.html
  http://plantpathology.ba.ars.usda.gov/cgi-bin/resource/iphyclassifier.cgi

Source: Fránová J, Bertaccini A, Duduk B (2014) Molecular tools in COST FA0807 Action. In: Bertaccini A (ed.) Phytoplasmas and phytoplasma disease management: how to reduce their economic impact, 179-184.
Available online: http://www.cost.eu/download/FAP_FA0807

Marcone C (2014) Molecular biology and pathogenicity of phytoplasmas. *Annals of Applied Biology* **165**(2), 199-221.

Additional key words: taxonomy **Computer codes:** 1PHYPG

2015/119 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, and indicated in bold the situation of the pest concerned using the terms of ISPM no. 8.

- **New records**

During a faunistic survey carried out in 2014, *Frankliniella occidentalis* (Thysanoptera: Thripidae) was found in field-grown cucumbers (*Cucumis sativus*) near Baku, Azerbaijan (Kasatkin, 2014). **Present, first found in 2014 near Baku.**

Ceratitis capitata (Diptera: Tephritidae – EPPO A2 List) was first recorded in Southern Iran in 1958, and subsequently in Northern Iran in 1980. Recent studies showed that in the province of Mazandaran (Northern Iran), where the pest is now widespread, the levels of genetic diversity of its populations were very low. These results supported the hypothesis that *C. capitata* is of recent introduction in this province (Rajabiyan *et al*., 2015). In another paper, the presence of *C. capitata* is recorded on citrus in Mazandaran, Golestan, Fars, and Kermanshah provinces (Cheraghian, 2012). **Present, restricted distribution.**

In Saudi Arabia, *Cucurbit chlorotic yellows virus* was detected for the first time in samples of cucumber (*Cucumis sativus*) which had been collected in March 2014 in 2 greenhouses in the Al-Kharj area, province of Riyadh. Affected plants showed interveinal chlorotic spots on lower leaves and were heavily infested by *Bemisia tabaci* biotype B. Further surveys are needed to delimit the extent of the disease in the country and identify its host plants. **Present, first found in 2014 in glasshouse cucumbers in the province of Riyadh** (Al-Saleh *et al*., 2015).

- **Detailed records**

In Russia, the first outbreaks of *Ceratitis capitata* (Diptera: Tephritidae – EPPO A2 List) were recorded in 1994 near the cities of Krasnodar and Novorossiysk (Krasnodar Krai, Southern Russia). In 2009-2010, the pest was again found in Krasnodar Krai near the city of Anapa. In autumn 2014, *C. capitata* was detected in a private garden in Rostov-on-Don (Rostov oblast, Southern Russia). Damage was observed on peaches and pears (*Prunus persica, Pyrus communis*). The number of larvae observed in collected fruit ranged from 8 to 15 per fruit. Phytosanitary measures were taken to eradicate the pest and prevent any further spread (Kasatkin and Poushkova, 2014). **Present, few occurrences, under eradication.**

In March 2014, chili pepper (*Capsicum annuum*) plants showing stunted growth and yellowing leaves were observed in a commercial field in Yuanmou county, Yunnan province, China. Examination of their root systems revealed the presence of heavily galled and rotting roots similar to damage caused by root-knot nematodes. Laboratory analysis confirmed the presence of *Meloidogyne enterolobii* (EPPO A2 List) in symptomatic plants. This is the first time that *M. enterolobii* is reported from Yunnan province and on hot pepper (Wang *et al.*, 2015).

Five isolates of *Plum pox virus* (*Potyvirus*, PPV – EPPO A2 List) were collected from from different regions of Russia (Moscow, Samara and Volgograd) on sweet and sour cherry trees (*Prunus avium* – 1 isolate; *P. cerasus* – 4) showing foliar symptoms. These isolates were characterized as PPV-C. This study confirms the occurrence of natural infections by PPV-C on sweet and sour cherry in Central and Southern Russia (Glasa *et al.*, 2014).

In the USA, by establishing a volunteer-based monitoring network staffed by county extension agents, agricultural research station personnel, growers, and entomological researchers, the presence of *Drosophila suzukii* (Diptera: Tephritidae – EPPO A2 List) was confirmed in Alabama, Arkansas, Delaware, Georgia, Massachusetts, Mississippi, Tennessee, and Vermont (Burrack *et al.*, 2012).

- **Diagnostic**

A new multiplex real-time PCR test has been developed in the USA for the detection of *Puccinia horiana* (EPPO A2 List) in chrysanthemum plants. This test can also distinguish between *P. horiana* and *P. chrysanthemi* (Demers *et al.*, 2015).

- **New host plants**

In August 2014, the presence of '*Candidatus* Phytoplasma solani' (EPPO A2 List) was detected in symptomatic plants of *Phaseolus vulgaris* collected from Stara Pazova (Vojvodina) in Serbia. Affected plants showed yellowing and downward rolling of the leaves (Mitrović *et al.*, 2015).

During summers 2012-2013 and 2014, unusual symptoms were observed at low prevalence in several plantations of *Dianthus barbatus* near Pančevo, Serbia. Affected plants showed leaf reddening, proliferation, flower bud deficiency and abnormal shoot production. Laboratory analysis confirmed the presence of '*Candidatus* Phytoplasma solani' (EPPO A2 List) in symptomatic plants (Josić *et al.*, 2015).

Source: Al-Saleh MA, Al-Shahwan IM, Amer MA, Shakeel MT, Abdalla OA, Orfanidou CG, Katis NI (2015) First report of *Cucurbit chlorotic yellows virus* in cucumber in Saudi Arabia. *Plant Disease* **99**(5), p 734.

Burrack HJ, Smith JP, Pfeiffer DG, Koeher G, Laforest J (2012) Using volunteer-based networks to track *Drosophila suzukii* (Diptera: Drosophilidae) an invasive pest of fruit crops. *Journal of Integrated Pest Management* **4**(3) doi: http://dx.doi.org/10.1603/IPM12012

Cheraghian A (2012) Introduction of fruits flies *Ceratitis, Bactrocera, Dacus* and *Rhagoletis* from Iran. *Tunisian Journal of Plant Protection* **7**(2), p 117.

Demers JE, Crouch JA, Castlebury LA (2015) A multiplex real-time PCR assay for the detection of *Puccinia horiana* and *P. chrysanthemi* on chrysanthemum. *Plant Disease* **99**(2), 195-200.

Glasa M, Shneyder Y, Predajna L, Zhivaeva T, Prikhodko Y (2014) Characterization of Russian *Plum pox virus* isolates provides further evidence of low molecular heterogeneity within the PPV-C strain. *Journal of Plant Pathology* **96**(3), 697-601.

Josić D, Starović M, Kojić S, Pivić R, Stanojković-Sebić, Zdravković M, Pavlović S (2015) *Dianthus barbatus* – a new host of Stolbur phytoplasma in Serbia. *Plant Disease* **99**(2), p 283.

Kasatkin DG (2014) Entomological expedition to Iran and Azerbaijan. *Plant Health Research and Practice* **4**(10), 8-9.

Kasatkin DG, Poushkova SV (2014) New report of Mediterranean fruit fly in Russia. *Plant Health Research and Practice* **4**(10), p 5.

Mitrović M, Cvrković T, Jović J, Krstić O, Jakovljević M, Kosovac A, Toševski I (2015) First report of '*Candidatus* Phytoplasma solani' infecting garden bean *Phaseolus vulgaris* in Serbia. *Plant Disease* **99**(4), p 551.

Rajabiyan M, Shayanmehr M, Mohammadi Sharif M (2015) The Mediterranean fruit fly (*Ceratitis capitata*) in Iran: genetic diversity and comparison with other countries. *Journal of Entomological and Acarological Research* **47**(1), 20-25.

Wang Y, Wang XQ, Xie Y, Dong Y, Hu XQ, Yang ZX (2015) First report of *Meloidogyne enterolobii* on hot pepper in China. *Plant Disease* **99**(4), p 557.

Additional key words: new record, detailed record, diagnostic, new host plant

Computer codes: CCYV00, CERTCA, DROSSU, FRANOC, MELGMY, PHYPSO, PPV000, PUCCHN, AZ, CN, IR, RS, RU, SA, US

2015/120 *Cenchrus longispinus* in the EPPO region: addition to the EPPO Alert List

Why

Cenchrus longispinus (Poaceae) is an annual grass species native to North America and invasive in South America, Australia and parts of the EPPO region. Historically, in the introduced range *C. longispinus* has been misidentified as one of its close congeners (*C. tribuloides* and *C. spinifex*).

Where

EPPO region: Belgium, Croatia, France, Greece, Hungary, Iran, Israel, Italy, Morocco, Romania, Ukraine.
North America: Canada (British Columbia, Ontario, Quebec), Mexico and the USA (Alabama, Arkansas, Arizona, California, Colorado, Connecticut, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, New Jersey, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin and Wyoming).
South America: Argentina and Venezuela.
Oceania: Australia.

Morphology

C. longispinus is an annual or short lived perennial grass species. A mature plant can grow to 0.2 - 0.9 m tall, often with many stems from the base. Sheaths are strongly compressed with the outer margin hairy. Ligules 0.6 – 1.8 mm length. Leaf blades are 4-27 cm long, 1.5 -7.5 mm wide, glabrous or pilose. Stems either upright or spreading along the ground, often forming mats. Stems root at nodes. Inflorescences are spiciform and linear 4.1 – 10.2 cm long and 1.2 - 2.2 cm wide. Fused panicle, with irregular axis branching. Flowers attached to stems rather than main axis. In the USA, flowering takes place from July through to September. The fruits persist in the burs which when dry become solid with sharp points. *C. longispinus* has often been confused with a number of closely related congeners including *C. tribuloides* and *C. spinifex*. This is highlighted in Verloove and Gullon (2012) who have explored the taxonomy of the genus throughout Europe and in many cases re-identified the aforementioned species as *C. longispinus*.

Biology and ecology

Species within the genus *Cenchrus* are generally well adapted to survive in harsh environments. The genus contains 20-40 species native to tropical and sub-tropical regions of the Old and New World. *Cenchrus longispinus* burs contain two types of seeds which varying in their innate dormancy. Primary seeds are formed on the upper spikelet and germinate within a year whereas secondary seeds are formed on the lower spikelets and can remain dormant for much longer periods. Seeds of *C. longispinus* can remain viable in the soil for up to 5 years and germinate after a period of rain. Each plant can contain up to 1000 egg shaped seeds.

Habitats

In the native range *C. longispinus* is found growing in sandy and recently disturbed soils. *C. longispinus* is found growing alongside roads and in abandoned fields. When growing in a soil substrate the plant prefers well-drained soil. In Maine, USA, the species grows in partial to full sun along river banks and beaches. In the native range the plant has weedy tendencies, where it invades agricultural habitats causing problems for harvesting. In Australia, the plant is recorded to invade irrigated agricultural areas where it is most commonly found. It is also found invading native rangeland, grassland, open woodlands, coastal environments and other sandy habitats. In Belgium, *C. longispinus* is associated with granaries, grain dumps, and unloading quays and is often found alongside roadsides, railways and tracks. In Ukraine, *C. longispinus* is an aggressive weed in sandy habitats in the south of the country and in ruderal habitats within the city of Dnipro. *C. longispinus* is invading the Black Sea nature reserve in Ukraine where it colonises sandy steppes and alluvial habitats. In Hungary the plant is recorded in open grasslands in particular in the great Hungarian Plain.

Pathways for movement
Spread by water is regarded as a minor pathway for the movement of *C. longispinus*. Movement by livestock and animals, by the burs sticking to fur and hair is regarded as one pathway for the spread of this species. Soltani *et al*. (2009) highlight that burs from *C. longispinus* will adhere to virtually anything from machinery, tyres and livestock. Repeated tillage aids dispersal of the plant via seed propagules.

Impacts
In Ontario Canada, *C. longispinus* has been shown to be an increasing problem in agricultural systems where it competes for moisture, nutrients and light. *C. longispinus* can reduce yields, hamper harvesting efficacy and degrade the overall quality of the yield through contamination. In Australia, the sharp burs are recorded to contaminate dry fruits reducing the marketability of the product.

Control
Chemical control of *C. longispinus* is effective using glyphosate, paraquat, fluazifop and a range of pre-emergent herbicides. Integrated control (the use of chemical and physical control methods) is the most effective method to manage infestations of this plant. Post-emergence chemical application is generally more successful than pre-emergent application.

Source:

Anderson RL (1997) Longspine sandbur (*Cenchrus longispinus*) ecology and interference in irrigated corn (*Zea mays*). *Weed Technology* **11**(4), 667–71.

Chemisquy AM, Giussani LM, Scataglini MA, Kellogg EA, Morrone O (2009) Phylogenetic studies favour the unification of *Pennisetum*, *Cenchrus* and *Odontelytrum* (Poaceae): A combined nuclear, plastid and morphological analysis, and nomenclatural combinations in Cenchrus. *Annals of Botany* **106**(1), 107–30.

Parsons WT, Cuthbertson EG (2000) Noxious Weeds of Australia. 2nd Ed. Inkata Press.

Protopopova VV, Shevera MV and Mosyakin SL (2006) Deliberate and unintentional introduction of invasive weeds: A case study of the alien flora of Ukraine. *Euphytica* **148**, 17–33.

Soltani N, Kumagai M, Brown L, Sikkema PH (2009) Long-spine sandbur [*Cenchrus longispinus* (Hack. in Kneuck.) Fernald] control in corn. *Canadian Journal of Plant Sciences* **90**, 241–45.

Szigetvári C (2002) Distribution and phytosociological relations of two introduced plant species in an open grassland in the Great Hungarian Plain. *Acta Botanica Hungarica*. **44**, 163–83.

Twentyman JD (1974) Environmental control of dormancy and germination in the seeds of *Cenchrus longispinus* (Hack.) Fern. *Weed Research* **14**, 1–11.

Verloove F, Sanchez Gullon E (2012) A taxonomic revision of non-native *Cenchrus* S.str. (Paniceae, Poaceae) in the Mediterranean area. *Willdenowia* **42**, 67–75.

Verloove F, Vandenberghe C (1999) Nieuwe En Interessante Voederadventieven Voor de Belgische Flora, Hoofdzakelijk in 1998. *Dumortiera* **74**, 23–32.

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

2015/121 Status of invasive alien plants in Turkey

Turkey harbours approximately 12 000 plant species of which 1.5 % are estimated to be alien species. New plant species are being described through botanical surveys and field work, though at present there is not a comprehensive list of invasive alien plants for the country. At present only *Eichhornia crassipes* and *Arceuthobium* spp. are listed as quarantine weeds in Turkey. In the current study the presence (including locations) and the status (alien or native) of plant species that feature in the EPPO plant lists (A2 List, List of Invasive Alien Plants, Observation List of Invasive Alien Plants and the EPPO Alert List) was evaluated for Turkey. Table 1 highlights those invasive alien plant species from the EPPO lists that are present in Turkey. All of these species are invasive in other EPPO countries and raising awareness on the negative impacts could go some way to highlighting the issue of invasive alien plants to different sectors of society.

Table. 1. Invasive Alien plants species present in Turkey and included in EPPO lists.

Species	Form	Origin	EPPO List
Ailanthus altissima (Simaroubaceae)	Terrestrial	Asia	List of Invasive Alien Plants
Ambrosia artemisiifolia (Asteraceae)	Terrestrial	North America	List of Invasive Alien Plants
Azolla filiculoides (Azollaceae)	Aquatic	North America	Observation List
Carpobrotus edulis (Aizoaceae)	Terrestrial	South Africa	List of Invasive Alien Plants
Cortaderia selloana Poaceae)	Terrestrial	South America	List of Invasive Alien Plants
Eichhornia crassipes (Pontederiaceae)	Aquatic	South America	A2 List
Ludwigia grandiflora (Onagraceae)	Aquatic	South America	A2 List
Miscanthus sinensis (Poaceae)	Terrestrial	Asia	Alert List
Oxalis pes-caprae (Oxalidaceae)	Terrestrial	South Africa	List of Invasive Alien Plants
Paspalum distichum (Poaceae)	Terrestrial	Americas	List of Invasive Alien Plants
Polygonum perfoliatum (Polygonaceae)	Terrestrial	Asia	A2 List
Rhododendron ponticum (Ericaceae)	Terrestrial	S. Europe & Asia	Observation List
Sicyos angulatus (Cucurbitaceae)	Terrestrial	North America	List of Invasive Alien Plants
Solanum elaeagnifolium (Solanaceae)	Terrestrial	North America	A2 List

Source: Arslan ZF, Uludag A, Uremis I (2015) Status of invasive alien plants included in EPPO lists in Turkey. *EPPO Bulletin* **45** (1), 66-72.

Additional key words: invasive alien plants, EPPO Lists **Computer codes:** TR

2015/122 *Landoltia punctata*: a new documented species

Landoltia punctata (Lemnaceae) is a freely floating aquatic species native to South-East Asia and Australia. In the EPPO region *L. punctata* has been recorded in Italy, Netherlands, Spain and Switzerland. *L. punctata* reproduces by vegetative budding of the daughter fronds from pouches at the base of each frond. The species can reproduce sexually, by seed, though this is reported to seldomly happen. The species grows well in low oxygen aquatic habitats. Natural dispersal is by water movement and movement by waterfowl or mammals. The plant is reported to have entered into Europe and other areas within its invasive range as a contaminant of the aquatic plant species trade. In the UK, in 2006, *L.*

punctata was recorded as a contaminant in garden centres. The impact of this plant species is currently unknown. *L. punctata* has the potential to block irrigation systems when the species forms dense mats on water bodies. Due to the uncertainty concerning ecological and economic impacts, at present this species does not warrant inclusion on the EPPO Alert List – instead a mini-datasheet has been prepared and will be published on the EPPO website.

Source: EPPO website. http://www.eppo.int/INVASIVE_PLANTS/iap_list/data_sheets/15-20550_DS_Landoltia_punctata.doc
Lansdown RV (2008) Red duckweed (*Lemna turionifera* Landolt) new to Britain. *Watsonia* **27**, 127-30.
Les DH, Crawford DJ (1999) *Landoltia* (Lemnaceae). A new genus of duckweeds. *Novon* **9**, 530-33.
Van Valkenburg JLCH, Pot R (2008) *Landoltia punctata* (G. Mey.) D.H.Les & D.J. Crawford (Smal kroos), Nieuw Voor Nederland. *Gorteria* **33**, 41-79.

Additional key words: invasive alien plants, EPPO Lists **Computer codes:** SPIOL

2015/123 *Pontederia cordata*: a new documented species

Pontederia cordata (Pontederiaceae) is a long lived perennial herbaceous aquatic species that roots within the mud substrate. The root system forms dense mats that cover the sediment. The species is native to the Americas. *P. cordata* grows in well saturated soils, at the interface between the aquatic and terrestrial environments, and in slow moving water bodies up to a depth of 40 cm. The species has been shown to form large monocultures in nutrient rich water bodies. *P. cordata* is a popular ornamental plant grown in gardens and parks. The species is widely traded in the horticultural industry. The invasive nature of *P. cordata* has been recorded in both the native and some of the introduced range. In South Africa, the species is recorded to compete with indigenous riverbank plant species and crop species when it encroaches in irrigated fields. In South Africa, *P. cordata* has been highlighted as forming dense stands which can block drainage canals and obstruct access to the edges of water bodies. In South Africa *P. cordata* has been recorded as being invasive in irrigation channels where it blocks water movement and drainage systems and can encroach onto agriculture land. In the EPPO region, *P. cordata* currently has a restricted distribution (the species is found in the wild in Belgium, France, Italy, Ireland, the Netherlands, Spain, Switzerland and the United Kingdom) but the species is seen more frequently growing as a garden/pond escapee. Due to the uncertainty concerning ecological and economic impacts coupled with a lack of information on the invasiveness of the species within the EPPO region - at present - this species does not warrant inclusion on the EPPO Alert List – instead a mini-datasheet has been prepared and will be published on the EPPO website.

Source: EPPO website. http://www.eppo.int/INVASIVE_PLANTS/iap_list/data_sheets/15-20677_DS_Pontederia_cordata.doc
National Botanic garden of Belgium (2015) *Pontederia cordata* manual of the alien plants of Belgium. http://alienplantsbelgium.be/content/about-us. [accessed in May 2015]
Q-bank (2013) Comprehensive databases of quarantine plant pests and diseases. http://www.q-bank.eu/ [accessed in May 2015]

Additional key words: invasive alien plants, EPPO Lists **Computer codes:** POFCO

2015/124 International ragweed day (2015-06-27)

2015-06-27 is the 'international ragweed day' which aims to promote awareness raising on the negative impacts of *Ambrosia artemisiifolia* (Asteraceae) (EPPO List of Invasive Alien Plants). *A. artemisiifolia* is native to North America and a widespread invasive alien plant in the EPPO region. *A. artemisiifolia* is an annual species and a prolific seed producer - some specimens can produce up to 100 000 seeds. Seeds remain viable for 5-14 years. On heavily infested plots the population density can reach 500 plants per m^2. The species invades crop fields, orchards and vineyards and is commonly found along waterways, transportation networks and wasteland. *A. artemisiifolia* produces a large amount of pollen that is highly allergenic and can result in severe human respiratory symptoms such as asthma. As *A. artemisiifolia* invades crop systems this can result in a decline in yields. The annual economic cost of this invasive alien has been estimated at c. 4.5 billion EUR for Europe alone. An EU-Cost Action (FA1203) on the sustainable management of *A. artemisiifolia* was initiated in 2012 and involves over 250 scientists from 33 countries with the aim of coordinating the management of this species across Europe.

Source: International ragweed day website: http://ragweed.eu/2015-06-27-international-ragweed-day/

Bullock J, Chapman D, Schaffer S, Roy D, Girardello M, Haynes T, Beal S, Wheeler B, Dickie I, Phang Z, Tinch R, Civic K, Delbaere B, Jones-Walters L, Hilbert A, Schrauwen A, Prank M, Sofiev M, Niemel, S, R.is.nen P, Lees B, Skinner M, Finch S, Brough C (2012). Assessing and controlling the spread and the effects of common ragweed in Europe (ENV.B2/ETU/2010/0037). European Commission, Final Report.

Essl F, Biró K, Brandes D, Broennimann O, Bullock JM, Chapman DS, Chauvel B, Dullinger S, Fumanal B, Guisan A, Karrer G, Kazinczi G, Kueffer C, Laitung B, Lavoie C, Leitner M, Mang T, Moser D, Müller-Schärer H, Petitpierre B, Richter R, Schaffner U, Smith M, Starfinger U, Vautard R, Vogl G, von der Lippe M, Follak S (2015). Biological flora of the British Isles: *Ambrosia artemisiifolia*. *Journal of Ecology*, DOI: 10.1111/1365-2745.12424

Additional key words: invasive alien plants, communication **Computer codes:** AMBEL

2015/125 14th International Symposium on Aquatic Plants (Edinburgh, GB, 2015-09-14/18)

The 14th International Symposium on Aquatic Plants will be held in Edinburgh between 2015-09-14/18. The scientific programme includes: ecotoxicology, trophic interactions in macrophyte beds, the future of invasive species management, community responses to environmental change in space and time, aquatic plants and physical processes, restoration, aquatic plant monitoring, ecological stoichiometry and nutrient cycling, riparian and aquatic vegetation: impacts of flow disturbance and flow regulation, and fundamental science.
The deadline for registration is 2015-07-10.

Source: 14th International Symposium on Aquatic Plants Website: https://sites.google.com/site/aquaticplants2015/conference-outline

Additional key words: invasive alien plants, conference **Computer codes:** GB