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2023/079 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 (or formerly included) on the EPPO Alert List, and indicated in bold the situation of the pest concerned using the terms of ISPM 8.

- **New records**

In Australia, lettuce chlorosis virus (*Crinivirus,* LCV – formerly EPPO Alert List) was first detected during a survey of the Northern Peninsula Area (NPA) of Cape York region, Queensland in 2021 in a sample of *Calopogonium mucunoides* (Filardo *et al.*, 2023). **Present: not widely distributed**.

In Pakistan, cowpea mild mottle virus (*Carlavirus,* CPMMV – EU Annexes) was detected in 2018 in a soybean (*Glycine max*) field at Faisalabad, Pakistan (Rahman *et al.*, 2023). **Present: not widely distributed**.

- **Detailed records**

Impatiens necrotic spot virus (*Tospovirus* – EPPO A2 List) is reported from the first time from Arizona (US). INSV was reported in lettuce (*Lactuca sativa*) in March 2021 (Hasegawa *et al.*, 2022).

- **Eradication**

In Italy, the outbreak of the fungus *Geosmithia morbida* (EPPO A2 List) found in 2016 in the municipality of Robecco sul Naviglio (region of Lombardia) (EPPO RS 2019/102) is considered eradicated. In 2016, 1 *Juglans nigra* tree was found to be infected and felled. In 2019, another *J. nigra* was found to be infected in the same area. The infected plant and two adjacent walnut trees were felled. Surveillance in 2020-2022 did not detect the pest. In Lombardia, 352 and 413 plants of *Juglans* sp. were checked in 2021 and 2022, respectively and no infected plants were found. In addition, no infected plants have been found in nurseries and no reports of suspicious or symptomatic plants have been made by professional operators or citizens.

The situation of *Geosmithia morbida* in Italy is officially declared as: **Present, only in some parts of the Member State concerned** (NPPO of Italy, 2023-04).

In Japan, although *Acidovorax citrulli* (EPPO A1 List) had been detected on a few occasions from 1998 to 2012 on *Citrullus lanatus* and *Cucumis melo* in several production sites (located in Honshu, Hokkaido, Kyūshū and Shikoku), eradication measures have always been immediately taken (including destruction of affected plants). Annual official surveys carried out on approximately 600 production sites have confirmed that the bacterium has been absent from Japan since 2013.

The pest status of *Acidovorax citrulli* in Japan is officially declared as: **Absent, pest eradicated.**

- **Diagnostics**

An on-site loop-mediated isothermal amplification (LAMP) test has been developed in the Netherlands to identify larvae of *Thaumatotibia leucotreta* (Lepidoptera: Tortricidae – EPPO A2 List) and *Helicoverpa armigera* (Lepidoptera: Noctuidae – EPPO A2 List). This may be used by inspectors during import inspections (Griekspoor *et al.*, 2023).

- **Host plants**

In Brazil, the nematode *Aphelenchoides besseyi* (EPPO A2 List) is reported for the first time causing leaf spot on cowpea (*Vigna unguiculata*) under field conditions. During field inspections in May 2021 and June 2022, *A. besseyi* was found in two areas located within the municipality of Rio Largo, state of Alagoas, North-Eastern Brazil. Its identity was confirmed by morphological, morphometric and molecular tests (Noronha *et al.*, 2023).

In India, the nematode *Meloidogyne graminicola* (EPPO Alert List) is reported for the first time infecting a wild species of jute, *Corchorus aestuans*. *M. graminicola* was found in plants growing in the municipality of Nalhati (West Bengal). Its identity was confirmed by morphological, morphometric and molecular tests (Rahaman Kahn *et al.*, 2023).

- **Epidemiology**

Experiments on *Ralstonia syzygii* subsp. *celebesensis* (EPPO A1 List) causing banana blood disease confirms that this bacterium is highly transmissible via tools from an infected plant to a healthy one. The bacterium can also be transferred from a mother plant to the suckers. Unlike to other *Ralstonia* species, plant-to-plant transmission through water appears not to be a major pathway for spread (Ray *et al.*, 2022).

- **New pests and taxonomy**

In the USA, laurel wilt is a serious disease of redbay (*Persea borbonia*) and some other tree species which is caused by *Raffaelea lauricola*, a fungus which serves as a food source for the redbay ambrosia beetle, *Xyleborus glabratus* (Coleoptera: Curculionidae: Scolytinae – EPPO Alert List). Recent taxonomic studies within the order Ophiostomatales have concluded that this fungus should be moved to a new genus and called *Harringtonia lauricola* (de Beer *et al.*, 2022).

Sources:

De Beer ZW, Parocter M, Wingfield MJ, Marincowitz S, Duong TA (2022) Generic boundaries in the Ophiostomatales reconsidered and revised. *Studies in Mycology* **101**, 57–120. https://doi.org/10.3114/sim.2022.101.02

Filardo F, Waterhouse B, Jones L, Campbell P (2023) Yambean mosaic virus and lettuce chlorosis virus in Australia. *Australasian Plant Disease Notes* **18**, 9. https://doi.org/10.1007/s13314-023-00495-1

Griekspoor Y, Kurm V, Jakomin T, Bonants P, Schoen C (2023) Development of an on-site LAMP assay for identification of *Thaumatotibia leucotreta* and *Helicoverpa armigera* larvae on rose. *European Journal of Plant Pathology* **165**(3), 593-601.

Hasegawa DK, Hladky LJ, Wintermantel WM, Putman AI, Barman A, Slinski S, Palumbo J, Poudel-Ward B (2022) First report of impatiens necrotic spot virus infecting lettuce in Arizona and southern desert regions of California. *Plant Disease* **106**(8), 2274. https://doi.org/10.1094/PDIS-09-21-2118-PDN

NPPO of Italy (2023-04).

NPPO of Japan (2023-04).

Noronha MD, Assunção MC, Muniz MD, Machado AC (2023) *Aphelenchoides besseyi* causing leaf spot on cowpea under field conditions in Brazil. *Australasian Plant Disease Notes* **18**, 11. https://doi.org/10.1007/s13314-023-00496-0.

Rahaman Khan M, Mondal S, Singh A, Pal S (2023) First report of rice root-knot nematode (*Meloidogyne graminicola*) infecting wild jute (*Corchorus aestuans*). *Australasian Plant Disease Notes* **18**, 12. https://doi.org/10.1007/s13314-023-00497-z

Rahman SU, Domier LL, Raza G, Ahmed N, McCoppin NK, Amin I, Mansoor S (2023) Metagenomic study for the identification of viruses infecting soybean in Pakistan. *Australasian Plant Pathology* (early view). https://doi.org/10.1007/s13313-023-00909-9

Ray JD, Subandiyah S, Prakoso AB, Rincón-Flórez VA, Carvalhais LC, Drenth A (2022) Transmission of blood disease in banana. *Plant Disease* **106**(8), 2155-2164. https://doi.org/10.1094/PDIS-10-21-2373-RE

Additional key words: absence, detailed records, diagnostic, epidemiology, eradication, host plant, new pest

Computer codes: APLOBE, ARGPLE, CPMMV0, GEOHMO, HELIAR, LCV000, MELGGC, PSDMAC, RAFFLA, RALSSC, RALSSY, AU, BR, IN, IT, JP, PK

2023/080 New and revised dynamic EPPO datasheets are available in the EPPO Global Database

The EPPO Secretariat is in the process of revising the EPPO datasheets on pests recommended for regulation and creating new datasheets. This project is also supported by an EU grant agreement. This revision provides the opportunity to create dynamic datasheets in the EPPO Global Database in which the sections on pest identity, host range and geographical distribution are automatically generated by the database. It is planned that these dynamic datasheets will progressively replace the PDF documents that are currently stored in the database. Since the previous report (EPPO RS 2023/056), the following new and revised EPPO datasheets have been published in the EPPO Global Database:

- *Acrobasis pirivorella*. https://gd.eppo.int/taxon/NUMOPI/datasheet
- *Anthonomus bisignifer*. https://gd.eppo.int/taxon/ANTHBI/datasheet
- *Blueberry leaf mottle virus*. https://gd.eppo.int/taxon/BLMOV0/datasheet
- *Diabrotica virgifera virgifera*. https://gd.eppo.int/taxon/DIABVI/datasheet
- *Pucciniastrum minimum*. https://gd.eppo.int/taxon/THEKMI/datasheet

Source: EPPO Secretariat (2023-04).

Additional key words: publication

Computer codes: ANTHBI, BLMOV0, DIABVI, NUMOPI, THEKMI

2023/081 EPPO network of experts working on surveillance, monitoring, and control of *Agrilus planipennis*

Following a decision of the EPPO Panel on Quarantine Pests for Forestry and within the framework of an EPPO/EU project, a network of experts working on surveillance, monitoring, and control of *Agrilus planipennis* (Coleoptera: Buprestidae – EPPO A2 List) is being created.

Objective and scope: the objective of this network is to exchange data on monitoring and to get a better understanding of the current distribution and spread of this pest in the EPPO region. Moreover, information on effective trapping and management options could be shared. The network will focus on the EPPO region, however members from other regions are also welcome as significant knowledge on biology and experience on monitoring and control of this pest has been gathered in other parts of the world.

How the network will function: at the initial stage, the network will function as an email list maintained by the EPPO Secretariat, who will accumulate new information (monitoring, distribution, trapping, and management), including data sent by network members. The EPPO Secretariat will then regularly (normally once a month) send the accumulated information to network members via the email list. At a later stage, a teleconference will be organized to discuss the current situation and future plans. A new webpage dedicated to

A. planipennis has also been created to publish the most important news that will be gathered by the network:
https://www.eppo.int/RESOURCES/special_projects/agrilus_planipennis_network

Join the network: the EPPO Secretariat invites NPPOs, researchers, and practitioners to subscribe to the email list via the following link (your registered email address will not be disclosed): **https://forms.office.com/e/7GxvJkS0YT**

Network members are invited to send relevant information on surveillance, monitoring, and control of *Agrilus planipennis* to Dmitrii Musolin (EPPO Scientific Officer): **dm@eppo.int**

Source: EPPO Secretariat (2023-04).

Pictures: *Agrilus planipennis*. https://gd.eppo.int/taxon/AGRLPL/photos

Additional key words: network **Computer codes:** AGRLPL

2023/082 Pests newly found or intercepted in Germany

The following pests have recently been found in Germany or detected on imported plant material (interceptions) by the German NPPO. Express Pest Risk Analyses were conducted. A short summary is presented below.

- ***Aclees taiwanensis*** (Coleoptera: Curculionidae), native to Asia, is a pest of *Ficus* species. It was found in a nursery in Rhineland-Palatinate but is not expected to establish in Germany because of the climate. This pest already occurs in France and Italy (EPPO RS 2021/175) and could further spread to Southern Europe.

- ***Aculops gleditsiae*** (Acari: Eriophyidae) occurs in Baden-Württemberg. This monophagous mite feeds on *Gleditsia triacanthos*. It originates in eastern North America but is already established in Italy and Hungary. It is likely to establish outdoors in warmer parts of Germany and may spread to new areas in Southern Europe but potential damage is considered low as it is limited to *G. triacanthos*.

- ***Atherigona orientalis*** (Diptera: Muscidae) was intercepted on fruit of *Capsicum,* and *Solanum melongena* from various origins as well as on plants for planting of *Sansevieria cylindrica.* This fly often affects plants as a secondary pest but strong primary damage to various crops is also noted. The species has already been introduced in Cyprus, Israel and Spain and therefore it could establish in other Mediterranean areas. Measures are recommended in case of findings at import.

- ***Cecidophyes thailandica*** (Acari: Eriophyidae) was found in Baden-Württemberg on *Ficus binnendijkii* indoors. This gall mite is native to tropical and subtropical South-East Asia. Limited information is available about this species.

- ***Megalurothrips distalis*** (Thysanoptera: Thripidae) was intercepted on *Momordica* sp. from Rwanda. This thrips originates in Asia but also occurs in Africa, Türkiye, and the USA. It mainly affects Fabaceae. It is considered that it could establish in Germany and other EU Member States. Measures are recommended in case of findings at import.

- ***Stromatium barbatum*** (Coleoptera: Cerambycidae) was intercepted in wood packaging from India. This wood borer is native to tropical and subtropical regions of Asia and was introduced in several African countries. It was recently reported as causing damage to grapevine (*Vitis vinifera*) in India. It is not expected to be able to establish in Germany because of its climatic requirements but may establish locally in southern Europe.

- ***Tetranychus neocaledonicus*** (Acari: Tetranychidae) was found in a flat on *Debregeasia edulis*. This very polyphagous mite occurs in the tropics and is not expected to be able to establish in Germany. However it could establish in Southern Europe.

Source:
JKI (2021) Express PRA for *Aculops gleditsiae* – Occurrence
JKI (2022) Express-PRA zu *Atherigona orientalis* – Beanstandung
JKI (2022) Express-PRA zu *Stromatium barbatum* –Beanstandung
JKI (2022) Express-PRA zu *Cecidophyes thailandica* – Auftreten
JKI (2022) Express-PRA zu *Megalurothrips distalis* – Beanstandung
JKI (2022) Express-PRA for *Aclees taiwanensis* – Occurrence

JKI (2022) Express-PRA zu *Tetranychus neocaledonicus* –Auftreten

Available from https://pflanzengesundheit.julius-kuehn.de/risikoanalysen.html and from https://pra.eppo.int/institute/32

Additional key words: new pest, interception **Computer codes:** ACEETW, ACUPGL, ATHEOR, CECDTH, STMMBA, TAETDT, TETRNC, DE

2023/083 Spread of *Papilio demoleus* (Lepidoptera: Papilionidae) within the EPPO region

Papilio demoleus (Lepidoptera: Papilionidae) is a butterfly originating in Asia and the Middle East (from China westwards to Iran) where the larva is considered as a pest of citrus trees, in particular in nurseries. In the 2000s it was introduced in the Caribbean where it spread rapidly (EPPO RS 2006/212). In 2012, a specimen was recorded in Portugal (RS 2014/116), but it has not established there.

In recent years, *P. demoleus* has been recorded as spreading, probably via natural spread, as it is recorded as a strong flyer. It was first recorded in South-Eastern Türkiye in 2006 and in the Mediterranean part of Türkiye in 2018, as well as in Azerbaijan and the Mediterranean part of Syria in 2019, Lebanon in 2020 and Cyprus in 2021. A single observation was also made in Israel in 2021. *P. demoleus* is considered established in Cyprus where several generations were observed in 2022. Although the species has been recorded on citrus trees in Cyprus, Syria and Türkiye it is not (yet) reported as causing damage in citrus production regions.

P. demoleus is a beautiful butterfly which may be well adapted to reporting via amateur entomologists and citizen science projects.

A distribution map is available at: https://gd.eppo.int/taxon/PAPIDE/distribution

Source: John E, Bağlar H, Başbay O, Konstantinou G, Salimeh M, Wiemers M (2022) Confirmation of the presence of nominotypical *Papilio demoleus demoleus* Linnaeus, 1758 (Lepidoptera: Papilionidae) in Cyprus, with additional notes on breeding and potential colonization. *Entomologist's Gazette* **73**(2),117-128.

John E, Başbay O, Salimeh M, Bağlar H (2022) Where next? The seemingly inexorable spread of *Papilio demoleus* Linnaeus, 1758 Lime Swallowtail (Lep.: Papilionidae) in countries of the eastern Mediterranean and its arrival in Cyprus in 2021. *Bulletin of the Amateur Entomologists' Society* **81**, 59-67.

Riaz S, Johnson JB, Rasheed T, Wiemers M (2020) Morphology, life cycle and management of two invasive subspecies of *Papilio demoleus* (Lepidoptera: Papilionidae): A review. *Journal of Applied Entomology* **144**(10), 845-856.

Additional key words: new record **Computer codes:** PAPIDE, CY

2023/084 *Amauromyza karli*: an emerging pest of quinoa in the USA

Amauromyza karli (Diptera: Agromyzidae) is considered to be a Palaearctic and oligophagous species, feeding on *Chenopodium* spp. (Amaranthaceae). Very little information is available about the biology and ecology of *A. karli*. Its host range remained unknown for many years, but so far, the weeds *C. album* and *C. vulvaria*, as well as quinoa (*C. quinoa*) have been recorded as host plants. Until recently, *A. karli* was not known to cause any particular economic damage to plants.

In North America, *A. karli* was first recorded in Canada in 1969 in Ontario, and later recorded in other provinces (Alberta, British Columbia, Manitoba, Nova Scotia, Québec, Saskatchewan). Most specimens collected from Canada have been trapped, but some have been collected from *C. album* and quinoa fields without any indication of damage. The first report of economic damage came from the USA, where *A. karli* was observed in 2021 severely damaging quinoa crops in the San Louis Valley in Colorado. Damage is caused by larvae which feed extensively in the stems of *C. quinoa*, thus disrupting nutrient transport, causing lodging, reduced yield, and even plant mortality. As a consequence, the area grown with quinoa in Colorado decreased from 3 000 acres (1 200 ha) in 2021 to 900 acres (360 ha) in 2022. In addition, 100% of quinoa fields in Colorado were affected by *A. karli* in 2022 and farmers suffered significant crop and economic losses. In the USA, quinoa is largely imported from South America (Bolivia, Peru), but is a developing crop that is mainly grown in Idaho, Oregon and Washington. Research will be carried out to develop management strategies against this emerging pest of quinoa.

In the EPPO region, quinoa is also an expanding crop due to a rising demand from consumers for nutritious, plant-based proteins, and gluten-free food. In addition, quinoa is adapted to high elevations, poor soil conditions, high temperature fluctuations, low water resources and is perceived as an interesting alternative crop in the context of climate change. For the moment, it is very difficult to predict if *A. karli* has the potential to become a pest of quinoa in the EPPO region. However, attention should be paid to this insect which is already present in the natural environment.

According to the literature, the geographical distribution and host range of *A. karli* are as follows:

EPPO region: Croatia, Czech Republic, Finland, France, Germany, Greece, Hungary, Poland, Romania, Slovakia, Spain, Sweden, Switzerland.
Asia: Korea (Republic of), Mongolia.
North America: Canada (Alberta, British Columbia, Manitoba, Nova Scotia, Ontario, Québec, Saskatchewan), USA (Colorado, Maryland).

Host range: *Chenopodium album, C. quinoa, C. vulvaria.*

Pictures of *A. karli* can be viewed on the Internet:
https://entomologytoday.org/2023/04/20/united-states-quinoa-fly-pest-amauromyza-karli/

Sources: Boucher S (2012) Revision of the Canadian species of *Amauromyza* Hendel (Diptera: Agromyzidae). *Canadian Entomologist* **144**, 733–757.
Černý M, von Tschirnhaus M, Winqvist K (2021) First records of Palaearctic Agromyzidae (Diptera) from 40 countries and major islands. *Acta Musei Silesiae, Scientiae Naturales* **69**, 193-229.

Gil-Ortiz R, Falcó-Garí JV, Oltra-Moscardó MT, Martinez M, Moreno-Marí J, Jiménez-Peydró R (2009) New host-plants for Agromyzidae (Diptera) from Eastern Spain. Bollettino di Zoologia Agraria e di Bachicoltura **41**(2), 71–86.
Lonsdale O (2021) Manual of North American Agromyzidae (Diptera, Schizophora), with revision of the fauna of the "Delmarva" states. *ZooKeys* **1051**, 1–481. https://doi.org/10.3897/zookeys.1051.64603
Szczepaniec A, Alnajjar G (2023) New stem boring pest of quinoa in the United States. Journal of Integrated Pest Management **14**(1), 1–7. https://doi.org/10.1093/jipm/pmad004

Additional key words: new pest **Computer codes:** AMAZKA, US

2023/085 First report of *Meloidogyne enterolobii* in Italy

The NPPO of Italy recently informed the EPPO Secretariat of the first finding of *Meloidogyne enterolobii* (EPPO A2 List) on its territory. The root knot nematode was detected following the report by the NPPO of the Netherlands concerning a finding of *M. enterolobii* in *Ficus microcarpa* plants imported from China (EPPO RS 2023/046) and re-exported to Italy. *M. enterolobii* was found in March 2023 in one greenhouse where *F. microcarpa* are grown in pots in the municipality of Piancastagnaio (province of Siena, Toscana region). Leaves and roots were asymptomatic. The entire lot will be destroyed and nematicides applied on plants of the same species throughout the production site. An intensive monitoring programme will be carried out in the production site. Trace back and forward inspections related to the presence of *M. enterolobii* are ongoing.

The pest status of *Meloidogyne enterolobii* in Italy is officially declared as: **Transient, actionable, under eradication**.

Source: NPPO of Italy (2022-04).

Pictures: *Meloidogyne enterolobii*. https://gd.eppo.int/taxon/MELGMY/photos

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

2023/086 Update on the situation of *Meloidogyne graminicola* in Italy

In Italy, the nematode *Meloidogyne graminicola* (EPPO Alert List) was first reported in 2016 from Piemonte region (EPPO RS 2016/211) on rice (*Oryza sativa*) crops and wild plants growing in their vicinity, and in 2018 in rice fields in Lombardia (RS 2018/196). Official measures were applied in both areas. The phytosanitary measures that were implemented effectively reduced the population density of *M. graminicola*, but complete eradication proved to be challenging due to difficulties in weed management and in keeping fields flooded throughout the year.

- In Piemonte, at the end of 2020 the infested area covered about 103 hectares (77 rice fields). Only seven fields (in which the pest was detected in 2016) had symptomatic plants and yield reduction was only observed in one field (RS 2020/052). In 2020-2022 no new infestations were found. *M. graminicola* has not been detected for three consecutive years in 57 fields. As of 2023, the infested zone comprises 20 paddy fields (about 25 hectares), with very low levels of infestation. In accordance

with EU Regulation 2022/1372, containment measures are now applied in the municipalities of Buronzo, Mottalciata, Gifflenga and Castelletto Cervo.

- In Lombardia, eradication measures have been applied up to 2020. The infested area was then 346 ha. Containment measures according to a regional decree in 2021 and EU Regulation 2022/1373 in 2022 have been applied in 16 municipalities in the province of Pavia. As of December 2022, 668 ha are considered as infested areas, and 1955 ha as buffer zones (100 m around an infested field).

The pest status of *Meloidogyne graminicola* in Italy is officially declared as: **Present, in specific parts of the Member State, where host crop(s) are grown, under containment, in case eradication is impossible**.

Source: NPPO of Italy (2022-12, 2023-04).

Commission Implementing Regulation (EU) 2022/1372 of 5 August 2022 as regards temporary measures to prevent the entry into, the movement and spread within, the multiplication and release in the Union of *Meloidogyne graminicola* (Golden & Birchfield). OJL 206, 16-27 http://data.europa.eu/eli/reg_impl/2022/1372/oj

Unità di Crisi -19 Ottobre 2022 Piano di Azione *Meloidogyne graminicola* https://fitosanitario.regione.lombardia.it/wps/portal/site/sfr/DettaglioRedazionale/organismi-nocivi/nematodi/red-meloidogyne (includes a map of the demarcated area).

Pictures: *Meloidogyne graminicola*. https://gd.eppo.int/taxon/MELGGC/photos

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

2023/087 First record and eradication of *Hirschmanniella caudacrena* in Switzerland

The NPPO of Switzerland recently informed the EPPO Secretariat of the first finding of the nematode *Hirschmanniella caudacrena* on its territory. *Hirschmanniella* spp. (except *H. behningi*, *H. gracilis*, *H. halophila*, *H. loofi* and *H. zostericola*) are A1 quarantine pests for Switzerland. It can be noted that *H. caudacrena* has been recently found and eradicated in Denmark (EPPO RS 2023/047).

Following a notification in February 2023 that 135 *Vallisneria* plants probably infested with *H. caudacrena* had been imported into Switzerland in November 2022, trace back and forward inspections were conducted to detect the nematode. An infested plant was found in the canton of Schaffhausen in March 2023 in an aquarium shop. The necessary measures were taken and the infestation was eradicated.

The pest status of *Hirschmanniella caudacrena* in Switzerland is officially declared as: **Absent, pest eradicated**.

Source: NPPO of Switzerland (2023-04).

Pictures: *Hirschmanniella caudacrena*. https://gd.eppo.int/taxon/HIRSCA/photos

Additional key words: new record, eradication, absence **Computer codes:** HIRSCA, CH

2023/088 First record and eradication of a non-European *Hirschmanniella* species in Germany

The NPPO of Germany recently informed the EPPO Secretariat of the first finding of a non-European species of *Hirschmanniella* on its territory. *Hirschmanniella* spp. (except *H. behningi, H. gracilis, H. halophila, H. loofi* and *H. zostericola*) are A1 quarantine pests for the EU.

Trace-forward activities linked to an outbreak in Denmark of *Hirschmanniella caudacrena* in aquatic plants of the genus *Vallisneria* (EPPO RS 2023/047) identified that small lots (10 plants in total, including *V. spiralis* 'Tiger', and *Vallisneria* 'Gigantea' (syn. *V. nana*)) from the infested site in Denmark had been delivered to Germany to a retailer in Schleswig-Holstein. The *Vallisneria* plants had been originally imported from Malaysia.

Part of the lot had already been sold to final consumers. All the remaining plants were removed from the basin and sampled. Only one adult nematode of a non-European *Hirschmanniella* species was detected. The species could not be identified but it was not a European species and, based on the finding in Denmark, it is considered that it is probably *H. caudacrena*. Aquatic plants of other genera in the same basin were sampled and tested negative. The water in the basin is constantly renewed. The outbreak is considered eradicated.

The pest status of *Hirschmanniella caudacrena* in Germany is officially declared as: **Absent, pest eradicated**.

Source: NPPO of Germany (2023-04).

Pictures: *Hirschmanniella caudacrena*. https://gd.eppo.int/taxon/HIRSCA/photos

Additional key words: new record, eradication, absence **Computer codes:** 1HIRSG, HIRSCA, DE

2023/089 First report of *Meloidogyne luci* in Serbia

During an official survey conducted in August 2021, *Meloidogyne luci* (EPPO Alert List) was found for the first time in Serbia. This root-knot nematode was detected in a tomato (*Solanum lycopersicum*) glasshouse in the village of Lugovo, near Sombor (Vojvodina province). Affected tomato plants showed yellowing, stunting, and extensive root galls. The identity of the nematode was confirmed by molecular tests (RT-PCR and sequencing). This is the first time that *M. luci* is reported from Serbia. The authors hypothesized that climate change and in particular higher temperatures could lead to further spread and greater damage caused by *M. luci* to various field crops in the future.

Source: Bačić J, Pavlović M, Kušić-Tišma J, Širca S, Theuerschuh M, Gerič Stare B (2023) First report of the root-knot nematode *Meloidogyne luci* on tomato in Serbia. *Plant Disease* **107** (early view). https://doi.org/10.1094/PDIS-01-23-0164-PDN

Pictures: *Meloidogyne luci*. https://gd.eppo.int/taxon/MELGLC/photos

Additional key words: new record **Computer codes:** MELGLC, RS

2023/090 *Fusarium oxysporum* f. sp. *cubense* Tropical race 4: addition to the EPPO Alert List

Why: Fusarium wilt or Panama disease caused by *Fusarium oxysporum* f. sp. *cubense* is a severe fungal disease of banana, and a quarantine pest in most banana-producing countries. Four different races of *F. oxysporum* f. sp. *cubense* have been designated based on their pathogenicity to different reference varieties under field conditions. In particular, race 1 caused severe economic losses during the mid-20th century to the cultivation and trade of cultivar 'Gros Michel' in Central America and the Caribbean, until it was replaced by resistant Cavendish cultivars. In 1992 a new variant of *F. oxysporum* f. sp. *cubense* called the tropical race 4 (TR4) was identified in South-East Asia infecting a wide range of banana cultivars, including Cavendish clones. In 2013, TR4 was reported for the first time in Africa, in Mozambique. In 2019, it was found in Colombia, which was the first finding in Latin America where approximately two thirds of the world banana trade originate. In the EPPO region, TR4 has been reported in Jordan (EPPO RS 2014/170), Israel (RS 2018/106 and 2019/059) and Türkiye (RS 2020/015). In Israel, the disease is subject to eradication measures. Considering the serious economic damage TR4 is inflicting to banana production and its limited occurrence in the EPPO region, it was felt useful to add TR4 to the EPPO Alert List.

Where:
EPPO region: Israel, Jordan, Türkiye.
Africa: Mayotte, Mozambique.
Asia: China (Fujian, Guangdong, Guangxi, Hainan, Yunnan), India (Bihar, Gujarat, Madhya Pradesh, Uttar Pradesh), Indonesia (Irian Jaya, Java, Kalimantan, Sulawesi, Sumatra), Israel, Japan (Ryukyu Archipelago), Jordan, Laos, Lebanon, Malaysia, Myanmar, Oman, Pakistan, Philippines, Taiwan, Thailand, Vietnam.
South America: Colombia, Peru, Venezuela.
Oceania: Australia (Northern Territory, Queensland), Micronesia, Tonga.

On which plants: *Musa* spp. TR4 has overcome the resistance to *F. oxysporum* f. sp. *cubense* in Cavendish clones and can attack other banana cultivars such as plantains, cooking bananas and a diverse range of dessert bananas which are major sources of food in tropical countries.

Damage: Affected banana plants show irregular yellowing of the margins of older leaves, which later turn brown, dry out and collapse around the pseudostem. Stem splitting can also be observed. Internal symptoms include yellow to reddish-brown discolouration of the vascular tissues. Affected plants show a wilted appearance and rarely produce marketable bunches.

Dissemination: *F. oxysporum* f. sp. *cubense* is a soil-borne fungus and it is considered that its clamydospores can survive for several years in the soil. Planting material, water, soil particles, tools, footwear and machinery can efficiently disseminate the fungus.

Pathways: Plants for planting, soil, soil contaminating tools, footwear, and machinery from countries where TR4 occurs.

Possible risks: It is generally accepted that TR4 represents one of the biggest threats to banana production worldwide. There are no curative treatments, and it is estimated that most banana cultivars commercially grown are susceptible to the disease. Research is being carried out to produce tolerant or resistant banana varieties, but this is part of a long-term strategy. It is thus essential to avoid the introduction of TR4 into areas that are still free from it. In the EPPO region, banana production is limited to its warmer parts, such parts of

the Mediterranean Basin (e.g. Canary Islands (ES), Cyprus, Greece, Israel, Italy, Jordan, Madeira (PT), Morocco, Türkiye). The fact that TR4 has been detected in restricted areas around the Mediterranean Basin shows that it has the potential to enter the region. In its risk assessment for the European Union, EFSA concluded that TR4 has the characteristics of a quarantine pest for the European Union. As the economic impact of TR4 is expected to be high, it could be advised that banana-growing countries in the EPPO region take measures against this pathogen. It should be noted that FAO and the IPPC are coordinating many actions against this disease including workshops, websites, communication material, and guidelines to help NPPOs preparing their response to TR4 outbreaks should they occur on their territory.

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EPPO RS 2023/090

Panel review date – Entry date 2023-04

Additional key words: Alert List **Computer codes:** FUSAC4

2023/091 Absence of *Xylella fastidiosa* in Jordan

Official surveys have been conducted in Jordan from 2016 to 2021 to assess the possible presence of *Xylella fastidiosa* (EPPO A2 List), as well as its potential vectors.

Plant samples were collected from the different regions of Jordan. Approximately 899 grapevines (*Vitis vinifera*) were sampled from 378 fields, 1480 stone fruit trees (*Prunus armeniaca*, *P. avium*, *P. cerasifera*, *P. domestica*, *P. dulcis*, *P. mahaleb*, and *P. persica*) were sampled from 596 fields, 1225 citrus fruit trees (*Citrus clementina*, *C. limon*, *C. maxima*, *C. paradisi*, *C. reticulata*, and *C. sinensis*) were sampled from 415 fields, 292 pome fruit trees (*Cydonia oblonga*, *Eriobotrya japonica*, *Malus domestica*, and *Pyrus calleryana*) were sampled from 114 fields, and 1351 ornamental plants were sampled from 954 distinct places covering all fruit-tree-growing regions in Jordan.

For olive (*Olea europaea*), the official surveys were conducted in 2018-2019 in all olive growing regions of Jordan. A total of 975 commercial and non-commercial olive orchards were inspected for the presence of typical symptoms of *X. fastidiosa* and sampled.

All samples tested negative.

The situation of *Xylella fastidiosa* in Jordan can be described as: **Absent, confirmed by survey**.

Source: AbuObeid I, Al-Karablieh N, Haddadin J, Omari RA, Al-Jabaree AM, Al-Elaumi L, Mazahreh S (2020) Survey on the presence of *Xylella fastidiosa*, the causal agent of olive quick decline syndrome (OQDS) on olives in Jordan. *Archives of Phytopathology and Plant Protection* **53**(3-4), 188-197.

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Pictures: *Xylella fastidiosa*. https://gd.eppo.int/taxon/XYLEFA/photos

Additional key words: absence **Computer codes:** XYLEFA, JO

2023/092 New finding of *Ralstonia pseudosolanacearum* in Germany

In Germany, *Ralstonia pseudosolanacearum* (EPPO A2 List) was first found in a research institution in Hesse on symptomatic ginger plants (*Zingiber officinale)* and tomato *(Solanum lycopersicum)* in 2021, and again in the same location in June 2022 on ginger and cucumber *(Cucumis sativum)* plants.

In March 2023, it was found for the first time in Baden-Wuerttemberg, again in a research institution. Rhizomes of ginger (*Zingiber officinale*) originally imported for consumption had been planted in boxes to produce young plants. The plant protection service of Baden-Wuerttemberg took samples to issue plant passports and the official regional laboratory tested the samples as positive for *R. pseudosolanacearum*. The plants were asymptomatic. Samples were sent to the National reference laboratory for confirmation, but the results are pending. Eradication measures will be imposed: incineration of the infested plants, disinfection of the greenhouse and the boxes where the rhizomes were planted.

The origin of the outbreak is considered to be the organic ginger rhizomes (imported for consumption) that originated in Peru*.

The pest status of *Ralstonia pseudosolanacearum* in Germany is officially declared as: **Present, in specific parts of the Member State, where host crop(s) are grown, under eradication**.

* The only record of the presence of *R. pseudosolanacearum* in Peru is a single isolate collected from tomato in 1966.

Source: NPPO of Germany (2023-04).

Additional key words: detailed record **Computer codes:** RALSPS, DE

2023/093 First reports and eradication of cowpea mild mottle virus in Germany

The NPPO of Germany recently informed the EPPO Secretariat of the recent findings of cowpea mild mottle virus (*Carlavirus*, CPMMV – EU Annexes) on its territory.

In December 2022, the Dutch NPPO detected for the first time cowpea mild mottle virus in 1112 potted plants of *Hibiscus syriacus* during a post-entry inspection. The plants had been imported from Israel in March 2022 and were prepared for the final consumers. The NPPO of Germany was informed by the Dutch NPPO as part of trace-forward activities in January 2023.

- In September 2022, three plants of this lot were delivered to a nursery in Bavaria, Germany. The three *Hibiscus* plants were stored outdoors in the nursery. Symptoms were not visible as the plants had no foliage at that period. The samples were tested by the official Bavarian laboratory and CPMMV was identified. The 3 plants were cut in small pieces and destroyed by incineration. The competent authority in Bavaria considers the outbreak eradicated.
- In October 2022, one *H. syriacus* plant was delivered to a nursery in Niedersachsen, Germany and kept in an exhibition greenhouse where no other host plants were grown. The plant was sampled in March 2023 and tested positive for CPMMV. The plant will be incinerated.

It may be noted that *Hibiscus syriacus* was not previously recorded as a host of CPMMV, and that no other hosts have been recorded so far in the Malvaceae family.

The pest status of cowpea mild mottle virus in Germany is officially declared as: **Absent, pest eradicated**.

Source: NPPO of Germany (2022-04).

EPPO (2023) *Cowpea mild mottle virus*. EPPO datasheets on pests recommended for regulation. https://gd.eppo.int/taxon/CPMMV0/datasheet

Additional key words: new record, new host plant **Computer codes:** CPMMV0, DE, NL

2023/094 Presence of chrysanthemum stem necrosis in Belgium

The NPPO of Belgium recently informed the EPPO Secretariat of the presence of chrysanthemum stem necrosis virus (*Tospovirus*, CSNV – EPPO A1 List) on its territory. In Belgium, CSNV had been found in 2012 and eradicated in 2014 (EPPO RS 2013/028 and RS 2014/128).

As part of the national plant health survey, the presence of CSNV was confirmed on one variety of *Chrysanthemum x morifolium* cultivated in a greenhouse in the Western part of Belgium (province of West-Vlaanderen) in April 2023. The plants were asymptomatic but tested positive (RT-PCR). Other varieties cultivated in the same greenhouse were inspected and sampled. They were asymptomatic and tested negative. The source of the outbreak is under investigation. Official measures are applied: no plants can be moved or traded out of the greenhouse, and additional inspections and tests are being performed.

The pest status of chrysanthemum stem necrosis in Belgium is officially declared as: **Present, only in some parts of the Member State concerned**.

Source: NPPO of Belgium (2023-04).

Pictures: *Chrysanthemum stem necrosis virus*. https://gd.eppo.int/taxon/CSNV00/photos

Additional key words: new record **Computer codes:** CSNV00, BE

2023/095 Tomato mottle mosaic virus in seed accessions in Europe

Tomato mottle mosaic virus (*Tobamovirus*, ToMMV- EPPO Alert List) was first described in 2013 from a tomato crop sampled in 2009 in Mexico. It was subsequently found in the Americas, Asia and Europe causing infections on tomato and capsicum crops. However, there are questions about the real distribution of ToMMV worldwide. A study was conducted where historical seed accessions of *Solanum lycopersicum* and *Capsicum* spp. (including wild relatives) from the collection of the Centre of Genetic Resources, the Netherlands (CGN), were tested for ToMMV by real-time RT-PCR and Illumina sequencing. Seeds had been produced in France, Spain, and the Netherlands. Tomato seed produced in the Netherlands in 2007, in France in 2010 and 2011, and capsicum seed produced in Spain in 2015 and 2016 were positive for ToMMV.

This data shows that ToMMV has occurred in Europe before its first description and is possibly more widespread than currently known.

Source: Schoen R, de Koning P, Oplaat C, Roenhorst A, Westenberg M, van der Gaag DJ, Barnhoorn R, Koenraadt H, van Dooijeweert W, Lievers R, Woudt B (2023) Identification of Tomato mottle mosaic virus in historic seed accessions originating from France, the Netherlands and Spain, indicates a wider presence before its first description. *European Journal of Plant Pathology* (early view). https://doi.org/10.1007/s10658-023-02677-0

Additional key words: new record **Computer codes:** TOMMV0, ES, FR, NL

2023/096 Study on the susceptibility of tomato and *Capsicum* to an isolate of tomato mottle mosaic virus in China

Tomato mottle mosaic virus (*Tobamovirus*, ToMMV- EPPO Alert List) is a virus infecting tomato and *Capsicum*. While conducting the EPPO Pest Risk Analysis on ToMMV, there was little evidence of impact. Unlike in the case of tomato brown rugose fruit virus, there was no evidence of resistance breaking by ToMMV of the resistance genes/alleles *Tm-2*^{2} for tomato and *L* for capsicum, which confer resistance to several tobamoviruses such as ToMV and tobacco mosaic virus (TMV).

During surveys in 2020, Tettey *et al*. (2022) observed tomato cultivars exhibiting severe viral symptoms in commercial tomato farms in Weifang (Shandong, China). Symptoms included mosaic and mottling of the leaf, necrosis of the peduncles, necrosis of the calyxes, brownish-green patches on ripened fruits, yellow striations around ripe fruits, yellowish-green patches on fruits, blistering and necrotic rings on ripened fruits. early and late necrotic patches on fruits. ToMMV was the only virus detected, and the isolate was named ToMMV-Shandong. In experiments, symptoms, including severe mottling and stunting, were observed after mechanical inoculation of this isolate to 8 commercial cultivars of tomato with *Tm-2*^{2} resistance gene, and 7 commercial cultivars of *Capsicum* with *L* genes/alleles (specific alleles not determined), and systemic movement of the virus was shown. The authors note the need to screen tomato and capsicum lines to identify resistance to ToMMV and, in the case of *Capsicum* to identify the effective *L* alleles.

Source: Tettey CK, Yan ZY, ZHAO MS, Chao GE, Tian YP, Li XD (2022) Tomato mottle mosaic virus: Characterization, resistance gene effectiveness, and quintuplex RT-PCR detection system. *Journal of Integrative Agriculture* 21(9), 2641-2651. https://doi.org/10.1016/j.jia.2022.07.020

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Additional key words: detailed record **Computer codes:** TOMMV0, CN

2023/097 Potato yellow dwarf nucleorhabdovirus found infecting *Capsicum* spp. in Oklahoma (US)

During a field survey conducted in 2021 in commercial fields of *Capsicum* spp. in Caddo county, Oklahoma (US), disease symptoms were observed. Affected plants showed leaf distortion, mottling, apical yellowing, and vein banding. Leaf samples (17) were collected from diseased capsicum plants and tested in the laboratory by RT-PCR for the presence of pepper mild mottle virus. Two samples which had given negative results with PCR tests were further tested with HTS. In these 2 samples, results of HTS and additional tests confirmed the presence of potato yellow dwarf nucleorhabdovirus* (PYDV, EPPO A1 List). The EPPO Secretariat previously had no information on the presence of PYDV in Oklahoma and this is the first time that this virus is detected in capsicum plants.

* Now called *Alphanucleorhabdovirus tuberosum* under the new binomial nomenclature for viruses.

Source: Paslay C, Ali A (2023) First report of potato yellow dwarf nucleorhabdovirus infecting pepper (*Capsicum* spp.) in Oklahoma. *Plant Disease* **107**(early view). https://doi.org/10.1094/PDIS-01-23-0147-PDN

Pictures: *Alphanucleorhabdovirus tuberosum*. https://gd.eppo.int/taxon/PYDV00/photos

Additional key words: detailed record, host plant **Computer codes:** PYDV00, US

2023/098 *Abies cephalonica* in Austria

Abies cephalonica (Pinaceae) is an endemic conifer of the Greek mainland mountains and of some adjacent islands (e.g. Euboea). In its native range, *A. cephalonica* grows in a wide variety of Mediterranean mountain forests, mostly on calcareous soils, at altitudes between 400 and 1800 m above sea level. Since the second half of the 19th century, *A. cephalonica* has been utilised as an ornamental tree in parks and private gardens in the south of Vienna, Austria. Additionally, around the same time, small plantations for forestry were established in Niederschlatten near Bad Vöslau. In the late 1970s, a small forestry trial plantation (size: c. 3000 m^2) of *A. cephalonica* was established at Harzberg near Waldandacht northwest of Bad Vöslau and in the 1980s, several forestry trial plantations were established in Eastern Austria, mostly on the eastern rim of the Northern Calcareous Alps. During fieldwork in 2022, around known sites of plantation and at sites with mature planted trees in parks and gardens, 14 occurrences of escaped *A. cephalonica* were reported. All 14 sites are located at the eastern rim of the Northern Calcareous Alps in Lower Austria south of Vienna. Several populations are large, consisting of several hundred young trees, and a few populations have spread considerable distances from planted old trees and now cover several hectares. Some older escaped trees are already capable of reproduction. Escaped *A. cephalonica* in Austria occur mostly in deciduous and mixed forests and in old parks and hedgerows.

Source: Essl F (2022) Introduction, spread and distribution of *Abies cephalonica* in Austria. *BioInvasions Records* **11**(3), 593–599.

Additional key words: invasive alien plants, detailed record **Computer codes**: ABICE, AT

2023/099 Impact of *Ludwigia hexapetala* on native plants

Ludwigia hexapetala (Onagraceae) is native to South America and is an invasive alien aquatic plant species in the EPPO region. It has been grown as an aquatic ornamental species in the EPPO region and has escaped or been dumped as garden waste, subsequently becoming an invasive species in France, Italy and Spain. *L. hexapetala* can alter freshwater habitats by forming dense mats both in the water and along banks. Additionally, it can outcompete native plant species and have negative impacts on ecosystem services. One native species that can be threatened by *L. hexapetala* is *Utricularia australis* (Lentibulariaceae), a carnivorous aquatic species that has conservation status in Italy. A 21-day indoor experiment was performed in which *U. australis* was grown on its own (control tests) and together with *L. hexapetala*. Water chemical parameters were analysed and the growth and morphological traits of *U. australis* and *L. hexapetala* were measured weekly. Where the two species were grown together, oxygen concentration and pH were lower and conductivity higher than in control tests. The growth of *U. australis* was significantly reduced (both shoot length, internode number, and fresh weight) when grown with *L. hexapetala* compared to control plants. Overall, the study showed that *L. hexapetala* alters water parameters and negatively affects the growth of *U. australis*. Management measures should be undertaken against invasive populations of *L. hexapetala* to promote and restore native biodiversity.

Source: Pelella E, Questino B, Ceschin, S (2023) Impact of the alien aquatic plant *Ludwigia hexapetala* on the native *Utricularia australis*: evidence from an indoor experiment. *Plants* **12**, 811. https://doi.org/10.3390/plants12040811

Additional key words: invasive alien plants **Computer codes**: LUDHE, UTRVJ

2023/100 New records for *Amaranthus spinosus* and *Cardamine occulta* in Morocco

During field surveys on the Atlantic coastline of Morocco in 2021 two new alien plant species were recorded:

- *Amaranthus spinosus* (Amaranthaceae) is reported from a number of locations including Mehdia, Sidi Boughaba, Rabat, and Casablanca in a number of different habitats including roadsides, pavements, an ornamental tree nursery, gardens and waste lands. Population size ranged from several individuals to over 1000. *A. spinosus* is native to the Americas and is globally widespread (EPPO region, Africa, Asia and Australia) where it can be a problematic species in agricultural areas and pastures. It is often reported as a casual species in the EPPO region. Spread is via seed which are dispersed naturally by wind and water. Seed of *A. spinosus* is also reported as a contaminant of other plant seed, grain and agricultural machinery.

- *Cardamine occulta* (Brassicaceae) is reported from Mehdia, Sidi Boughaba, Rabat, and Sidi Taibi. It was found in plant nurseries and greenhouses. It is native to tropical Asia and is found in many countries in the EPPO region. In some EPPO countries, it is also a recent introduction, e.g. first recorded in Poland in 2019.

Source: Sukhorukov AP, Leger JF, Chambouleyron M (2023) Two new species alien to the flora of Morocco: *Amaranthus spinosus* (Amaranthaceae) and *Cardamine occulta* (Brassicaceae). *Flora Mediterranea* **33**, 31-38.

Pliszko A (2020) First record of Asian *Cardamine occulta* Hornem. (Brassicaceae) in Poland. *BioInvasions Records* **9**(3), 655–659

Additional key words: invasive alien plants, new record **Computer codes:** AMASP, CAROC, MA

2023/101 Increase in distribution of invasive alien plants in Slovakia

An assessment of the distribution and temporal changes in distribution of invasive alien plants was carried out between 2017–2021 in areas of non-forest and forest habitats in the central part of Slovakia. The study area was located in the western part of the Revúcka Highlands and covered 169 024 km^2 with an altitudinal range from 200 to 700 m above sea level. During the study period, 242 locations with invasive alien plant occurrences were recorded. In total, 11 species were recorded (Table 1). 10 of the 11 species showed an increase in distribution (occurrences m^2) over the course of the study. *Asclepias syriaca* was recorded in the studied area for the first time in 2020 and the area in which it occurred increased by 60 % in the second year. *Datura stramonium* increased by 2 150 % in 2021 compared to the values from 2017. *Fallopia japonica* increased by 507 % in 2021 compared to the distribution measured in 2017. *Helianthus tuberosus* was recorded for the first time in 2018. The increase in area in 2021 was 119 %. *Impatiens glandulifera* increased up to 833 % between 2017 and 2021. *Acer negundo* did not increase its area or the number of individuals in the studied area. The area with the occurrence of *Robinia pseudoacacia* increased by 487 % from 2017 to 2021. *Solidago canadensis* was shown to increase by 193 % from 2017 to 2021 and *Erigeron annus* by 1 680 %. The spread of invasive alien plants seen in the central part of Slovakia can be attributed to a number of factors including natural wind dispersal of seeds, such as *Erigeron annus,* as well as human assisted spread through land management and agricultural practices (contaminants of machinery).

Table 1. Eleven invasive alien plants recorded in the current study (EPPO List of IAP = EPPO List of Invasive Alien Plants)

Species	Family	EPPO Status	Origin
Acer negundo	Sapindaceae		Americas
Ailanthus altissima	Simaroubaceae	EPPO List of IAP	Asia
Asclepias syriaca	Apocynaceae	EPPO List of IAP	N. America
Datura stramonium	Solanaceae		Americas
Erigeron annuus	Asteraceae		N. America
Fallopia japonica	Polygonaceae	EPPO List of IAP	Asia
Helianthus tuberosus	Asteraceae	EPPO List of IAP	N. America
Impatiens glandulifera	Balsaminaceae	EPPO List of IAP	India, Pakistan, Nepal
Impatiens parviflora	Balsaminaceae		C. Asia
Robinia pseudoacacia	Fabaceae		N. America
Solidago canadensis	Asteraceae	EPPO List of IAP	Americas

Source: Wittlinger L, Petrikovičová L, Petrovič F, Petrikovič J (2022) Geographical distribution and spatio-temporal changes in the occurrence of invasive plant species in Slovak Republic. *Biosystems Diversity* **30,** 105-118.

Additional key words: invasive alien plants

Computer codes: ACRNE, AILAL, ASCSY, DATST, ERIAN, HELTU, IPAGL, IPAPA, POLCU, ROBPS, SOOCA, SK

2023/102 E-commerce can spread invasive alien plants

Globally, e-commerce plays a large role in buying and selling plant species for ornamental purposes. China is now the largest e-commerce market globally with online retail transactions forecast to reach 3.56 trillion USD by 2024. Non-native plant species are traded in online market places which can act as a pathway for spread of invasive alien plants. A list of 811 non-native plant species was compiled for China in which the species included represent the invasion continuum: 193 transient species, 275 established species and 343 invasive species. The online availability of these 811 species was assessed by searching Jingdong and Taobao, two of the biggest e-commerce platforms in China. Among the 3 invasion categories, the availability of invasive and established non-native species was significantly higher than that of the transient non-native species. Out of the 343 recognized invasives, 117 (34 %) were offered for sale. Some invasive species available for sale are species that can have serious economic and ecological impacts (e.g. *Lantana camara* and *Robinia pseudoacacia*). The three families that had the most species being traded were Asteraceae, Fabaceae and Poaceae. The study showed that non-native species were offered for sale in 5 different propagule types (dried plants, fresh plants, seed, seedlings and roots), seeds had a higher availability and price in the online marketplaces. The current study also reviewed the existing phytosanitary regulations in China and concluded they are inadequate in managing e-commerce of non-native plant species. To address this issue, a standardized risk assessment framework that considers perceptions of stakeholders and can be adapted/updated based on continuous surveillance of the trade network could be implemented. This could provide a template to strengthen trading regulations for non-native plant species and take proactive management measures.

Source: Banerjee AK, Lee TM, Feng H, Liang X, Lin Y, Wang J, Yin M, Peng H, Huang Y (2023) Implications for biological invasions of non-native plants for sale in the world's largest online market. *Conservation Biology* (early view). https://doi.org/10.1111/cobi.14055

Additional key words: invasive alien plants

Computer codes: LANCA, ROBPS, CH