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2023/243 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**

Frankliniella occidentalis (Thysanoptera: Thripidae, EPPO A2 List) occurs in Burkina Faso (Nacanabo *et al.*, 2023).

In February 2023, *Hishimonus phycitis* (Hemiptera: Cicadellidae – EU Annex IIA) a vector of phytoplasma diseases was found in two tropical exhibition greenhouses, at one location in the Eastern part of the Netherlands. The insect was found on imported tropical plants (*Cecropia, Codiaeum, Hibiscus, Lantana, Theobroma cacao*), but no symptoms were observed. Eradication measures were taken (NPPO of the Netherlands, 2023-07).
The pest status of *Hishimonus phycitis* in the Netherlands is officially declared as: **Present, under eradication.**

Ophraella communa (Coleoptera: Galerucinae) which feeds on leaves and flowers of *Ambrosia artemisiifolia* (EPPO List of IAP) is reported for the first time from France. At the end of summer 2023, the insect was observed near Lyon. It is hoped that the beetle will help limit *A. artemisiifolia* populations, and thus reduce pollen allergies (Observatoire des Ambroisies, 2023).

Tomato fruit blotch virus (*Blunervirus solani*, ToFBV) is first reported from Greece. It was detected in symptomatic tomatoes (*Solanum lycopersicum*) in three sites: in West Attica as well as in the islands of Evia and Kriti (Beris *et al.*, 2023).

Tomato mild mottle virus (*Ipomovirus*, TMMoV – EU Annex II A) occurs in India. Eggplant mild leaf mottle virus which is considered to be a strain of TMMoV was detected in leaf samples of aubergine (*Solanum melongena*) from Uttar Pradesh (Mishra *et al.*, 2023).

Tomato zonate spot virus (*Tospovirus,* TZSV) is first reported from Japan. It was identified in 2021 on green pepper (*Capsicum annuum*) in Kanagawa Prefecture. This is the first report of this recently described virus outside of China (EPPO RS 2013/130) (Shimada *et al.*, 2023).

- **Detailed records**

Beech leaf disease caused by the nematode *Litylenchus crenatae mccannii* (EPPO Alert List) was first detected in Maryland in September 2023. The disease is now present in eight counties in the State (University of Maryland Extension, 2023).

Lycorma delicatula (Hemiptera: Fulgoridae – EPPO A1 List) is still spreading westward in the USA with first findings in September 2023 in Illinois and Tennessee and in October in Kentucky (Illinois Department of Agriculture, 2023; Tennessee Department of Agriculture, 2023; Martin-Gatton College of Agriculture, Food and Environment, 2023).

In Canada '*Candidatus* Phytoplasma pruni' (EPPO A1 List) is reported for the first time in cherry trees (*Prunus avium*) (Urbez-Torres *et al.*, 2023).

In Italy, tomato brown rugose fruit virus (*Tobamovirus*, ToBRFV – EPPO A2 List) was detected for the first time from Sardegna in October 2023 on tomato (*Solanum lycopersicum*) grown under greenhouses for fruit production. Official measures are applied (NPPO of Italy, 2023).

- **Eradication**

In Germany *Ditylenchus destructor* (EU RNQP) was found in 2018 on tubers of *Dahlia* sp. The nematode was found in a nursery in Brandenburg. Official phytosanitary measures were taken, including prohibition of soil movement to cultivated land. The NPPO of Germany subsequently conducted a survey in the outdoor area of the nursery and the pest was not detected again.
The pest status of *Ditylenchus destructor* in Germany is officially declared as: **Absent: pest eradicated.**

In the Netherlands, sweet potato chlorotic stunt virus (*Crinivirus*, SPCSV - EU Annex II A) was first reported from 3 sites in 2022 (EPPO RS 2022/244). Official phytosanitary measures have been taken and the outbreaks are now considered eradicated (NPPO of the Netherlands, 2023).
The pest status of sweet potato chlorotic stunt virus in the Netherlands is officially declared as: **Absent, pest eradicated.**

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Additional key words: absence, detailed records, eradication, new records

Computer codes: DITYDE, FRANOC, HISHPH, LITYMC, OPHLCO, PHYPPN, SPCSV0, THRIPV, TOBRFV, TOFBV0, TOMMOV, TZSV00, BF, CA, DE, FR, GR, IN, IT, JP, NL, PR, US

2023/244 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 2023/223), the following new and revised EPPO datasheets have been published in the EPPO Global Database:

- *Botryosphaeria kuwatsukai*. https://gd.eppo.int/taxon/PHYOPI/datasheet
- *Cephalcia lariciphila*. https://gd.eppo.int/taxon/CEPCAL/datasheet
- *Chrysanthemum stunt viroid*. https://gd.eppo.int/taxon/CSVD00/datasheet
- *Chrysomyxa arctostaphyli*. https://gd.eppo.int/taxon/CHMYAR/datasheet
- *Comstockaspis perniciosa*. https://gd.eppo.int/taxon/QUADPE/datasheet
- *Mycodiella laricis*-leptolepidis. https://gd.eppo.int/taxon/MYCOLL/datasheet
- *Peach mosaic virus*. https://gd.eppo.int/taxon/PCMV00/datasheet
- *Peach rosette mosaic virus**. https://gd.eppo.int/taxon/PRMV00/datasheet
- *Phyllosticta solitaria*. https://gd.eppo.int/taxon/PHYSSL/datasheet
- *Squash leaf curl virus*. https://gd.eppo.int/taxon/SLCV00/datasheet

* Now *Nepovirus persicae* according to the new binomial nomenclature.

Source: EPPO Secretariat (2023-11).

Additional key words: publication

Computer codes: CEPCAL, CHMYAR, CSVD00, MYCOLL, PCMV00, PHYOPI, PHYSSL, PRMV00, QUADPE, SLCV00

2023/245 *Atherigona orientalis* (Diptera: Muscidae, pepper fruit fly): addition to the EPPO Alert List

Why: *A. orientalis* (Diptera: Muscidae) is a pantropical species. In the majority of its range, it is mostly living on decaying plant material, faeces and carrion, but is also recorded as a primary plant pest in some countries. It was recently found in a few locations on crops in the EPPO region (Greece - EPPO RS 2023/229) and has been intercepted at import (RS 2023/082). The EPPO Secretariat considered that *A. orientalis* could usefully be added to the EPPO Alert List.

Where: *A. orientalis* is a cosmopolitan pantropical species, but it has been introduced in countries outside of its range, e.g. Australia, Republic of Korea, USA, and recently countries in the EPPO region. It should be noted that it has only been reported as a plant pest in a limited number of countries (e.g. Egypt, Greece, India, Iraq, Kenya, Republic of Korea, Nigeria).
EPPO Region: Cyprus, France (mainland), Greece (Kriti), Israel, Spain (mainland, Islas Canárias), Türkiye.
Africa: Angola, Benin, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Comoros, Congo, Cote d'Ivoire, Egypt, Ghana, Kenya, Libya, Malawi, Mali, Mauritius, Mozambique, Namibia, Niger, Nigeria, Reunion, Saint Helena, Senegal, Seychelles, Sierra Leone, South Africa, Sudan, Tanzania, Togo, Uganda, Zambia.
Asia: Bangladesh, Bhutan, British Indian Ocean Territory, Brunei Darussalam, China (Guangdong, Guangxi, Hebei, Henan, Jiangsu, Zhejiang), Christmas Island, Cocos Islands, India (Andhra Pradesh, Assam, Bihar, Chandigarh, Delhi, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal), Indonesia (Irian Jaya, Java, Sumatra), Iraq, Israel, Japan (Ryukyu Archipelago), Korea Republic, Lebanon, Malaysia (Sabah, West), Nepal, Oman, Pakistan, Philippines, Saudi Arabia, Sri Lanka, Taiwan, Thailand, United Arab Emirates, Yemen.
North America: Mexico, USA (California, Florida, Georgia, Hawaii, Texas).
Central America and Caribbean: Barbados, Bermuda, Dominica, El Salvador, Jamaica, Panama, Puerto Rico, St Kitts-Nevis, Trinidad and Tobago, Virgin Islands (British).
South America: Argentina, Brazil (Goias, Mato Grosso do Sul, Rio de Janeiro, Sao Paulo), Chile (Easter Island), Colombia, Ecuador, Guyana, Paraguay, Peru, Venezuela.
Oceania: Australia (New South Wales, Northern Territory, Queensland), Cook Islands, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Micronesia, New Caledonia, Palau, Papua New Guinea, Pitcairn, Samoa, Solomon Islands, Tonga, Vanuatu.

On which plants: *A. orientalis* is mainly a saprophagous species, typically found in damaged plant material, including fruits. It may also develop in faeces, and carrion. Recently it was also recorded as a primary pest of certain crops, in particular in pepper (*Capsicum* spp.) and tomato (*Solanum lycopersicum*) but it may have a wider range as it has been recorded associated with plants and fruits of at least 25 families.

Damage: On plants, *A. orientalis* lays eggs on or under the calyx of the fruits, or in cracks on the surface of fruits (ripe or rotten). Eggs hatch after 1 day and larvae enter fruits, causing damage to the internal tissues. There are 3 larval stages. Pupation occurs in infested fruits or in the soil. The life cycle takes between 18 to 30 days, depending on temperature and humidity. Adults are small yellowish-grey flies with a body length of about 4 mm.

Dissemination: Adults can fly but there is no information on natural spread distances. Over long distances, the pest can be transported on its host plants, in particular fruits and vegetables.

Pathways: fruit and vegetables, plants for planting, soil? *A. orientalis* has been intercepted several times in consignments of fruits, vegetables and plants for planting from tropical countries.

Possible risks: *A. orientalis* is a highly polyphagous species. It can be a primary pest of capsicum and tomato which are important crops in the EPPO region, as well as other crops. Considering its current range, this fly could probably establish outdoors in the Mediterranean part of the EPPO region, and indoors in the rest of the region. In addition to its potential phytosanitary impact, *A. orientalis* has also a sanitary importance as it may transmit faecal pathogens and filth-borne diseases.

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EPPO RS 2023/245

Panel review date – Entry date 2023-11

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

2023/246 First report of *Thrips parvispinus* in Canada, and spread in the USA

*Thrips parvispinus (*Thysanoptera: Thripidae – formerly EPPO Alert List) is reported for the first time from Canada. It was found in 2022 in greenhouses in Southern Ontario on *Mandevilla* plants. In addition, another species, *Thrips setosus* (Thysanoptera: Thripidae – formerly EPPO Alert List) was also first found in 2022 in greenhouses in Southern Ontario on *Hydrangea* plants.

In the USA, *Thrips parvispinus* was first found in 2020 in Florida on greenhouse plants (EPPO RS 2021/027). It has now established outdoors in Florida, causing damage to pepper plants (*Capsicum* spp.). This species is an emerging pest of capsicum in Inda (RS 2023/031). It has

recently been recorded as occurring in Puerto Rico on peppers (*Capsicum annuum*) as well as in the following US states associated with trade of *Dipladenia, Mandevilla,* and *Gardenia jasminoides* plants: Colorado, Georgia, North Carolina, South Carolina. In addition, interceptions have been made in Ohio and Pennsylvania. *T. parvispinus* is now a regulated pest in the USA.

Source: Ahmed MZ, Revynthi AM, McKenzie CL, Osborne LS (2023) *Thrips parvispinus* (Karny), an emerging invasive regulated pest in the United States. https://mrec.ifas.ufl.edu/lsolab/thrips/thrips-parvispinus/ [accessed November 2023].

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Pictures *Thrips parvispinus*. https://gd.eppo.int/taxon/THRIPV/photos

Additional key words: new record, detailed record **Computer codes:** THRIPV, THRISE, CA, US

2023/247 Pests newly found or intercepted in Germany

The following pests were found in a post-entry quarantine facility for bonsais of *Pinus* spp. and *Taxus* spp. from Japan by the German NPPO. Express Pest Risk Analyses were conducted. A short summary is presented below.

Auletobius uniformis (Coleoptera: Attelabidae) is native in Japan. It is a pest of rose, strawberry and raspberry. It is considered likely to establish outdoors in the warmer areas of Germany as well as in the southern EU Member States. The phytosanitary risk for the EU is assessed as medium with a low-medium uncertainty. Measures are recommended in case of findings at import.

Autosticha kyotensis (Lepidoptera, Autostichidae) was also intercepted but not enough information was available to conduct an Express PRA. This species originates in Japan and has been introduced in the USA.

Homona magnanima (Lepidoptera: Tortricidae) is a moth that only occurs in Asia. It is polyphagous and is recorded as a pest of tea plants, as well as of apples, pears, and aubergines. It is considered likely to establish outdoors in the warmer areas of Germany, as well as in the southern EU Member States. The phytosanitary risk for the EU is assessed as medium-high with a low-medium uncertainty. Measures are recommended in case of findings at import.

Singapora shinshana (Hemiptera: Cicadellidae) is a leafhopper that only occurs in Asia. It is polyphagous and is recorded as a pest of *Prunus* species. It is considered likely to establish outdoors in Germany as well as in other EU Member States, and cause damage. The phytosanitary risk for the EU is assessed as medium with a low-medium uncertainty. Measures are recommended in case of findings at import.

Source: JKI (2023) Express-PRA zu *Auletobius uniformis* – Beanstandung.
JKI (2023) Express-PRA zu *Autosticha kyotensis* – Beanstandung.
JKI (2023) Express-PRA zu *Homona magnanima* – Beanstandung.
JKI (2023) Express-PRA zu *Singapora shinshana* – Beanstandung.

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:** AULTUN, AUTIKY, HOMOMA, SINASH, DE

2023/248 *Arge scita*, a potential pest of almond in Italy

In summer 2022, the regional plant protection service of Puglia (Italy) observed the occurrence of severe leaf damage of almond trees (*Prunus dulcis*) in the province of Lecce. The damage was caused by an insect, the sawfly *Arge scita* (Hymenoptera: Argidae) feeding on the leaves. Little is known about this species. It is known to occur in Eastern Europe (Bulgaria, Crete, Cyprus, Greece, Russia) and the Middle East (Iran, Jordan, Lebanon, Syria, Turkey, Turkmenistan and Armenia), but has not been recorded as a pest before. This is the first record of *A. scita* in Italy. It is considered established in the province of Lecce in an area of about 900 km^2.

Source: Cavalieri V, Donne AG, Saponari M, Carrieri M, Boscia D, Dongiovanni C (2023) *Arge scita* (Symphyta: Argidae): a potential emerging phytophagous for almond? *Phytoparasitica* **51**(3), 385-392.

Additional key words: new pest **Computer codes:** ARGESC, IT

2023/249 First report of *Corythucha marmorata* in Italy

Corythucha marmorata (Hemiptera: Tingidae – chrysanthemum lace bug) is reported for the first time in Italy, and in the EPPO region. During studies on Agromyzidae leaf miners, specimens of an unusual Tingidae were collected from leaves of *Arctium minus* (Asteraceae) in October 2022 in Olgiate Molgora (province of Lecco), Lombardia. In November 2022, further surveys were conducted in Lombardia in abandoned fields, as well as in crops near cemeteries and greenhouses where potential hosts (e.g. chrysanthemums) were grown. As a result, further specimens of *C. marmorata* were collected on several Asteraceae *(A. minus, Artemisia verlotiorum, Aster amellus, Chrysanthemum* sp.*, Solidago gigantea)* and in different localities.

The chrysanthemum lace bug nymphs and adults feed on the underside of leaves, removing cell contents, causing chlorosis and eventually premature leaf fall. In some cases, the entire plant may turn yellow and die.

C. marmorata originates from North America and has been introduced in the 2000s in China, Japan and the Republic of Korea, where it has clearly shown an invasive behaviour. In its native range, it mainly feeds on Asteraceae but in its invaded range, the pest has been reported on other plant families and in particular on *Ipomoea batatas* (sweet potato, Convolvulaceae) and *Solanum melongena* (aubergine, Solanaceae).

A distribution map and a list of host plants are available from the EPPO Global Database, as well as a picture of the pest kindly uploaded by Dioli *et al*.
https://gd.eppo.int/taxon/CRTHMA/distribution
https://gd.eppo.int/taxon/CRTHMA/hosts

Source: Dioli P, Mauri ES, Salvetti M (2022) *Corythucha marmorata* (Uhler, 1878), new alien species in Europe, found in Northern Italy (Hemiptera, Tingidae). *Revista gaditana de Entomología* **13**(1), 119-125.

Pictures: *Corythucha marmorata*. https://gd.eppo.int/taxon/CRTHMA/photos

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

2023/250 *Eutetranychus banksi* is spreading in Spain

Eutetranychus banksi (Acari: Tetranychidae) originates from the Americas and was first reported in Portugal in 1999, and in the south of Spain in 2001 (EPPO RS 2004/029). *E. banksi* then spread within the Iberian Peninsula. Recent research in the region of Valencia showed that since its arrival in 2013, *E. banksi* has displaced other mite pests, namely *Eutetranychus orientalis* (Acari: Tetranychidae – EPPO A2 List), and *Panonychus citri*, and has become the most common and abundant spider mite on citrus.

Source: López-Olmos S, Ferragut F (2023) The newcomer takes it all: the invader Texas citrus mite, *Eutetranychus banksi* (Acari: Tetranychidae), displaces the resident relatives in citrus agrosystems. *Biological Invasions* **25**, 3171–3192. https://doi.org/10.1007/s10530-023-03099-z

Additional key words: detailed record **Computer codes:** EUTEBA, ES

2023/251 First records of *Eutetranychus banksi* and *E. africanus* in Madeira (Portugal)

In Portugal, *Eutetranychus banksi* (Acari: Tetranychidae) was first reported on the mainland in 1999. In Madeira Island, the first specimens of *E. banski* were recorded in 2020. They were recorded on citrus species, as well as on bean (*Phaseolus vulgaris*), a new host record for this species. Sampled plants did not show any significant damage.

The same article reports for the first time the occurrence of *Eutetranychus africanus* (Acari: Tetranychidae) in Madeira in 2022 on *Citrus medica* (new host), *Carica papaya, Vitis vinifera* and *Ricinus communis*. This is a first record of this species for the EU. *E. africanus* is mainly found in regions with tropical or sub-tropical climates but it is already present in Egypt and Iran. Its presence in Northern Iran suggests its ability to survive cold winters, and therefore this species may represent an additional challenge for citrus orchards of the Mediterranean basin.

Source: Naves P, Aguiar AF, Santosa M, Nóbrega F, Varela AR, Silvaa MJ, Migeon A, Navia D, Auger P (2023) Two new alien *Eutetranychus* mites (Prostigmata, Tetranychidae) for Madeira Island, Portugal. *Acarologia* **63**(4), 1154-1162. https://doi.org/10.24349/t82c-9sz9

Additional key words: detailed record, new record, new host plant **Computer codes:** EUTEBA, EUTEAF, PT

2023/252 First report of *Xanthomonas arboricola* pv. *corylina* in Montenegro

In Montenegro, hazelnut (*Corylus avellana*) is a minor but rapidly increasing commercially grown species. In June 2021, a severe disease affecting more than 80% of the trees was observed on 6-year-old hazelnut plants (cv. Hall's Giant) in a 0.3-ha plantation near Cetinje, Central Montenegro. Affected trees showed numerous, small (2-3 mm diameter) necrotic spots on their leaves. As the disease progressed, lesions coalesced to form large necrotic areas, and necrotic leaves remained attached to twigs. Longitudinal brown lesions developed on twigs and branches, and necrotic buds were also noticed. No fruits were observed in the affected orchard. Symptomatic samples (leaf, bud and twig bark tissues) were collected. Laboratory analysis (biochemical, molecular and pathogenicity tests) confirmed the presence of *Xanthomonas arboricola* pv. *corylina* (EPPO A2 List) in the tested samples. This is the first time that this bacterium is detected in Montenegro. It is noted that phytosanitary measures will have to be implemented to prevent any further spread of the disease.

The situation of *Xanthomonas arboricola* pv. *corylina* in Montenegro can be described as: **Present, not widely distributed.**

Source: Popović T, Adamović J, Ivanović M, Prokić A, Obradović A (2023) First report of *Xanthomonas arboricola* pv. *corylina* causing bacterial blight on hazelnut tree (*Corylus avellana*) in Montenegro. *Plant Disease* **107**(9), 2836. https://doi.org/10.1094/PDIS-01-23-0138-PDN

Pictures: *Xanthomonas arboricola* pv. *corylina*. https://gd.eppo.int/taxon/XANTCY/photos

Additional key words: new record **Computer codes:** XANTCY, ME

2023/253 First report of *Xanthomonas oryzae* pv. *oryzae* in Madagascar

Until recently, bacterial leaf blight caused by *Xanthomonas oryzae* pv. *oryzae* (EPPO A1 List) was considered to be absent from Madagascar, as shown by regular monitoring for rice diseases carried out since the 1980s. In December 2019, symptoms resembling those of bacterial leaf blight were observed in 2 rice (*Oryza sativa*) fields in Vakinankaratra, the Central Highlands of Madagascar. Affected plants showed yellow to greyish, water-soaked lesions starting from the leaf tip and progressing along the central vein or leaf margin. At a later stage, leaves became completely desiccated and sometimes had droplets of yellow exudate at the leaf margin. Symptomatic leaf samples were collected from these 2 fields. Laboratory analysis (morphological, PCR, pathogenicity tests) confirmed the presence of *X. oryzae* pv. *oryzae*. Further surveys conducted in the regions of Vakinankaratra and Menabe from 2020 to 2022 confirmed the presence of the bacterium in Madagascar and a sharp increase in disease incidence.

The situation of *Xanthomonas oryzae* pv. *oryzae* in Madagascar can be described as follows: **Present, not widely distributed.**

Source: Raveloson H, Rabekijana R, Rakotonanahary NM, Szurek B, Muller B, vom Brocke K, Hutin M (2023) First report of bacterial leaf blight disease of rice caused by *Xanthomonas oryzae* pv. *oryzae* in Madagascar. *Plant Disease* **107**(8), 2510. https://doi.org/10.1094/PDIS-03-23-0411-PDN

Pictures: *Xanthomonas oryzae pv. oryzae*. https://gd.eppo.int/taxon/XANTOR/photos

Additional key words: new record **Computer codes:** XANTOR, MG

2023/254 Update on the situation of *Ralstonia pseudosolanacearum* in surface water in the Netherlands

In the Netherlands, *Ralstonia pseudosolanacearum* (EPPO A2 List) was first found in surface water in 2020 in the province of Utrecht, and in the province of Overijssel (EPPO RS 2021/179, RS 2023/165). In order to prevent any further spread of the bacteria with water, it is prohibited to use surface water to irrigate seed potatoes across the whole country. In areas where EU regulated *Ralstonia* species have been found in surface water, it is prohibited to use surface water to irrigate any type of potato crops.

Since July 2023, *R. pseudosolanacearum* was first recorded in the province of Friesland and new findings were also recorded in two other areas (provinces of Utrecht and Overijssel) in the vicinity of findings reported before. The findings in Friesland are at a great distance from the earlier findings and do not appear to be connected.

As part of the 2023 water survey in total 13 water samples (out of 1937) tested positive for *R. pseudosolanacearum*, as well as one sample of the weed *Solanum dulcamara* (out of 51). The irrigation prohibition area for potato cultivation has been adjusted accordingly.

The pest status of *Ralstonia pseudosolanacearum* in the Netherlands is officially declared as: **Present in several locations, only in specific waterways and under official control**.

Source: NPPO of the Netherlands (2023-11). https://english.nvwa.nl/topics/pest-reporting/documents/plant/plant-health/pest-reporting/documents/pest-report-update-finding-of-ralstonia-pseudosolanacearum-in-surface-water-in-the-netherlands-provinces-friesland-utrecht-and-overijssel-november-2023

Pictures *Ralstonia pseudosolanacearum*. https://gd.eppo.int/taxon/RALSPS/photos

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

2023/255 *Lasiodiplodia regiae*: a new species causing canker and dieback of fruit trees in China

Fungal diseases causing canker and dieback of fruit trees can cause serious economic losses in commercial orchards. In China, studies on trunk diseases were carried out from 2019 to 2021 in the Henan province. Ten orchards of various fruit tree species were surveyed and symptomatic samples were analyzed in the laboratory for the presence of fungal pathogens. As a result, 150 isolates of Botryosphaeriaceae were obtained from *Actinidia chinensis* (kiwifruit), *Juglans regia* (walnut), *Prunus persica* (peach), *Prunus pseudocerasus* (Chinese sour cherry), *Vitis vinifera* (grapevine), and *Ziziphus jujuba* (jujube). Affected trees showed symptoms of stem canker, branch dieback and gummosis. Morphological examination and phylogenetic analysis revealed the presence of *Botryosphaeria dothidea* and of a new species, *Lasiodiplodia regiae* sp. nov. This new species was found in *A. chinensis, J. regia, P. persica, P. pseudocerasus, V. vinifera* and *Z. jujuba*, from 4 locations in Henan. Pathogenicity tests showed that *L. regiae* can cause canker, dieback and gummosis in 4 studied hosts (*J. regia, P. persica, P. pseudocerasus, V. vinifera*). The authors noted that although *B. dothidea* was the dominant pathogen in the studied orchards in Henan, *L. regiae* was more common in orchards located in the warmer central and southern areas, and that *L. regiae* was not only more virulent than *B. dothidea* but also had a wider host range. It is concluded that further research is needed on this emerging pathogen to better understand its biology and develop control strategies.

Source: Wang Y, Xie S, Cao J, Zhao H, Yin X, Guo Y, Xu C, Guo L, Wu H, Zhang M (2023) *Lasiodiplodia regiae* sp. nov.: a new species causing canker and dieback of fruit trees in China. *Phytopathology* **113**(7), 1210-1221.

Additional key words: new pest **Computer codes:** LSDPRE, CN

2023/256 Potato rugose stunting virus, a newly characterized potato virus

In the 1990s, a previously uncharacterized disease of viral aetiology was observed in cultivated potatoes (*Solanum tuberosum)* in Southern Peru. It was named potato rugose stunting disease (PRSD) and was reported to cause severe symptoms in infected potato plants, including mosaic and deformation of the leaves and stunting (EPPO RS 2006/237).

Studies showed that the disease was caused by an unknown isometric virus, which was provisionally coded SB26/29. This virus had been intercepted on potato in the Netherlands and in the USA. SB26/29 was categorized as a potential quarantine pest for the European Union by EFSA but has not yet been added to the EU quarantine lists.

Recent research further characterized this virus and showed that it belonged to the genus *Torradovirus* and is a new species tentatively named potato rugose stunting virus (PotRSV).

Surveys in Peru detected PotRSV in the regions of Cusco, Huánuco, Ica, Junín, Lima, and Puno with a low incidence (2.3 to 5.5%). PotRSV was often found in mixed infections but when found alone, leaf symptoms ranged from mild mosaic to stunting and rugosity. Although it was suggested in the past that this virus could be transmitted by the psyllid *Russelliana solanicola,* vector transmission experiments performed by the authors using two insect species, *Myzus persicae* and *R. solanicola* were not successful.

Host range studies with artificial inoculation showed that tomato (*Solanum lycopersicum*) and pepper (*Capsicum annuum*) could be asymptomatic hosts.

Source: Alvarez Quinto RA, Amao M, Muller G, Fuentes S, Grinstead S, Fuentes-Bueno I, Roenhorst A, Westenberg M, Botermans M, Kreuze J, Mollov D (2023) Evidence that an unnamed isometric virus associated with potato rugose disease in Peru is a new species of torradovirus. *Phytopathology* **113**(9), 1716-1728. https://doi.org/10.1094/PHYTO-11-22-0449-V

EFSA Panel on Plant Health (2020) Pest categorisation of non-EU viruses and viroids of potato. *EFSA Journal* **18**(1), e05853. https://doi.org/10.2903/j.efsa.2020.5853

Additional key words: new pest, taxonomy **Computer codes:** POTRSV, PE

2023/257 Update of the situation of tomato mottle mosaic virus in the EPPO region

In 2022 EPPO conducted a pest risk analysis on tomato mottle mosaic virus (*Tobamovirus*, ToMMV – EPPO Alert List). As it had been detected in a seed bank in historical seed accessions (EPPO RS 2023/095), it was noted that ToMMV is possibly more widespread in the EPPO region than currently known. To address this issue, the EPPO Secretariat recently conducted a survey on the detection of ToMMV in EPPO countries.

In the Czech Republic, seeds infected by ToMMV had already been detected in 2020 (EPPO RS 2020/252). A survey was conducted in 2021 and 2022 in tomato and pepper seeds. Nine

seed lots tested positive in 2021 (from China, the Czech Republic and Poland) and 5 in 2022 (from India and the Czech Republic).

In Germany, 128 leaf samples of tomato plants and 8 leaf samples of pepper were tested for ToMMV during the surveillance for tomato brown rugose fruit virus (ToBRFV). One tomato sample tested positive for ToMMV.

In Slovenia, 60 and 66 tomato and pepper plant samples were tested for ToMMV in 2022 and 2023 respectively. All plant samples were negative. Tomato and pepper seed lots were also tested and one (from China) tested positive.

In the United Kingdom, 87 and 54 tomato plant samples were tested in 2022 and 2023 respectively. All plant samples were negative. Tomato and pepper seed lots were also tested: 163 in 2022 and 162 in 2023, 16 and 5 seed lots tested positive respectively.

Source: NPPOs of Czech Republic, Germany, Slovenia, United Kingdom

EPPO (2022) EPPO Technical Document No. 1088. Pest risk analysis for Tomato mottle mosaic virus. EPPO, Paris. Available at https://gd.eppo.int/taxon/TOMMV0/documents

Pictures: *Tomato mottle mosaic virus*. https://gd.eppo.int/taxon/TOMMV0/photos

Additional key words: new record **Computer codes:** TOMMV0, CZ, DE, GB, SI

2023/258 Virus species associated with apple russet ring and apple green crinkle diseases

Among fruit disorders, the EU Regulation 2019/2072 lists as Regulated Non-Quarantine Pests (RNQPs) for *Malus* species 'russet ring' and 'green crinkle'. They are also listed by other EPPO countries. Apple russet ring and apple green crinkle are graft-transmitted diseases which were first reported more than 60 years ago but no association between a specific virus and the disease had been clearly demonstrated. However they were regulated or included in certification schemes of a number of countries at that time. In 2020, Li *et al*. conducted a series of experiments and showed that 'russet ring' was caused by a variant of apple chlorotic leaf spot virus and that 'green crinkle' was caused by apple stem pitting virus (both also listed as RNQPs by the EU).

It can be noted that James *et al*. in 2013 had already considered that 'apple green crinkle associated virus' (AGCaV) could be a variant or strain of ASPV.

EPPO note: These results will be reflected in the EPPO Global Database, and as a consequence the EPPO Codes for these two diseases (APLP00 for russet ring, and APGC00 for green crinkle) will be deactivated, and the disease names will be reassigned to their associated viruses.

Source: James D, Varga A, Jesperson GD, Navratil M, Safarova D, Constable F, Horner M, Eastwell K, Jelkmann W (2013) Identification and complete genome analysis of a virus variant or putative new foveavirus associated with apple green crinkle disease. *Archives of Virology* **158**, 1877-1887.

Li C, Yaegashi H, Kishigami R, Kawakubo A, Yamagishi N, Ito T, Yoshikawa N (2020) Apple russet ring and apple green crinkle diseases: Fulfillment of Koch's postulates by virome analysis, amplification of full-length cDNA of viral genomes, in vitro

transcription of infectious viral RNAs, and reproduction of symptoms on fruits of apple trees inoculated with viral RNAs. *Frontiers in Microbiology* **11**, 1627. https://doi.org/10.3389/fmicb.2020.01627

Commission Implementing Regulation (EU) 2019/2072 of 28 November 2019 establishing uniform conditions for the implementation of Regulation (EU) 2016/2031 of the European Parliament and the Council, as regards protective measures against pests of plants, and repealing Commission Regulation (EC) No 690/2008 and amending Commission Implementing Regulation (EU) 2018/2019. Consolidated available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02019R2072-20231009

Additional key words: taxonomy, regulation **Computer codes:** ACLSV0, ASPV00

2023/259 Review of Citrus phantom diseases

Aknadibossian *et al*. (2023) reviewed Citrus 'phantom disorders' of presumed virus and virus-like origin. They provide a list of 55 citrus phantom disorders that should be disregarded and not used in the scientific literature as they cannot be considered as being associated with a pathogenic aetiology or should have their names updated to reflect today's knowledge and their association with currently known pathogens or abiotic factors.

In the EPPO Global Database (GD), when a disease agent has been identified this has gradually been reflected in the database (i.e. diseases have been assigned to their causal agents). However, when analyzing the list provided by Aknadibossian *et al*. (2023), the EPPO Secretariat noted that the following citrus diseases still had an entry in GD. As a consequence, these diseases will be either removed from GD (e.g. Citrus gum pocket agent), or reassigned to their associated pathogens (e.g. Citrus zonate chlorosis agent will be assigned to *Higrevirus waimanalo*). All obsolete EPPO Codes will be deactivated.

Name	Preferred name in EPPO GD	EPPO Code	Comment
Gum pocket/ gummy pitting/ wood pitting	Citrus gum pocket agent	CSGP00	Disorders possibly of physiological or stress origin that could be enhanced by viroid infection
Algerian navel orange virus (ANOV)	Algerian navel orange virus	ANOV00	Apart from the original report, there is no other mention of ANOV, and no type isolate is available today
Citrus yellow mottle	Citrus yellow mottle virus	CIYMV0	Only observed in 3 trees in Japan in 1984. Initial isolates were lost and the disease has not reappeared. Should not be confused with citrus yellow mottle-associated virus recently reported from Pakistan
Bahia bark scaling (BBS)	Citrus Bahia psorosis agent	CSBP00	Recently showed to be caused by a fungus, *Lasiodiplodia iraniensis*
Zonate chlorosis	Citrus zonate chlorosis agent	CSZC00	Recently, hibiscus green spot virus 2 (*Higrevirus waimanalo*, HGSV2) was shown to be the causal agent of this disorder

Name	Preferred name in EPPO GD	EPPO Code	Comment
Leathery leaf	Citrus leathery leaf agent	CSLL00	Apart from the original report, there is no other mention of this disease, and no type isolate is available today

Source: Aknadibossian V, Freitas-Astúa J, Vidalakis G, Folimonova SY (2023) Citrus phantom disorders of presumed virus and virus-like origin: what have we learned in the past twenty years? *Journal of Citrus Pathology* **10**(1). http://dx.doi.org/10.5070/C410161176

Additional key words: taxonomy **Computer codes** HGSV20, LSDPIR

2023/260 Are sterile eggs a suitable substrate for the egg parasitoid *Trissolcus japonicus*?

Halyomorpha halys (Hemiptera: Pentatomidae – formerly EPPO Alert List) originates from Asia and has emerged as an invasive pest in North America and Europe in the 1990s and 2000s, respectively. Management of this pest is mainly by chemical insecticides however this is not very effective because of the high mobility of the pest and its ability to develop resistance to synthetic insecticides. Classical biological control of *H. halys* has been researched using the egg parasitoid *Trissolcus japonicus* (Hymenoptera: Scelionidae). *T. japonicus* completes its larval development within a single egg. In the pests native range, the use of sentinel fertile egg masses to detect egg parasitoids is a useful method, however applying this method in in the invasive range could lead to spread of the pest species. Using sterile sentinel eggs to record indigenous egg parasitoids is a potential alternative. The study used sterile eggs of *H. halys* obtained in three ways: (1) irradiation of fresh eggs with gamma rays (irradiated eggs), (2) eggs obtained by mating *H. halys* fertile females with irradiated males (sterile insect technique (SIT) eggs) and (3) refrigeration of fresh *H. halys* eggs at 8°C for a minimum of 14 days (refrigerated eggs, control). The proportion of emergence of parasitoids was different for the three egg types. The 1-day-old SIT eggs tested had parasitoid emergence rates above 90 % and had similar values for eggs tested which were up to 10 days old. For the eggs tested which were 20 days old, the proportion of emerged insects dropped to 75 %. In contrast, irradiated and refrigerated eggs had lower emergence of parasitoids from 1-day-old eggs tested (84 % and 78 %), while values were higher for 4 day old eggs tested and similar values for 7 day old eggs. For the eggs tested which were 20 days old, the proportion of emergence for both the irradiated and the refrigerated eggs dropped significantly compared to the SIT eggs. The results suggest that SIT and biological control could be combined for the biological control of *H. halys*.

Source: Roselli G, Anfora G, Sasso R, Zapponi L, Musmeci S, Cemmi A, Suckling DM, Hoelmer KA, Ioriatti C, Cristofaro M (2023) Combining irradiation and biological control against Brown Marmorated Stink Bug: are sterile eggs a suitable substrate for the egg parasitoid *Trissolcus japonicus*? *Insects* **14**, 654. https://doi.org/10.3390/insects14070654

Pictures: *Trissolcus japonicus*. https://gd.eppo.int/taxon/TRSSJP/photos

Additional key words: biological control **Computer codes:** TRSSJP, HALYHA

2023/261 Biological control of *Pontederia crassipes* in South Africa

Pontederia crassipes (Pontederiaceae: EPPO A2 List) is one of the world's most invasive aquatic plants. Native to South America, *P. crassipes* has been introduced into the EPPO region where it can cause significant negative impacts including blocking water channels, degrading biological diversity, and providing breeding grounds for mosquitoes. Although nine biological control agents have been released against *P. crassipes* in South Africa, populations of the species remain above a tolerable level. Despite the large suite of introduced natural enemies, classical biological control of *P. crassipes* is constrained by cooler temperatures experienced in the more temperate areas of South Africa. *Megamelus scutellaris* (Hemiptera: Delphacidae) is a phloem-feeding bug which was released in South Africa in 2013 and causes a reduction in the photosynthetic efficiency of the plant. Although it is usually used as a classical biological control agent, inundative releases have been conducted, in which large numbers of *M. scutellaris* are released regularly. This has resulted in excellent establishment along with a significant reduction in *P. crassipes* cover in areas where,

historically, biological control seemed unlikely due to excessive eutrophication. This study has shown that inundative releases of biological control agents over multiple seasons results in the most effective control of *P. crassipes*, especially at cool temperatures and eutrophic sites.

Source: Miller B, Coetzee JA, Hill MP (2023) Evaluating the establishment of a new water hyacinth biological control agent in South Africa. *African Entomology* **30**, e15613. https://doi.org/10.17159/2254-8854/2023/a15613

Pictures: *Pontederia crassipes*. https://gd.eppo.int/taxon/EICCR/photos

Additional key words: biological control **Computer codes:** EICCR, ZA

2023/262 Biological control of *Fallopia* species using the psyllid *Aphalara itadori*

Aphalara itadori (Hemiptera: Psyllidae) is a classical biological control agent for the invasive knotweed species (Polygonaceae) *Fallopia japonica, F. sachalinensis* and their hybrid *F.* × *bohemica* (all EPPO List of Invasive Alien Plants). Host range and performance testing has shown that *A. itadori* shows interpopulation variation in its performance on the three hosts. Psyllids collected from Hokkaido show a higher performance on *F. sachalinensis* (the predominant species in that area), whereas a population from Southern Japan (Kyushu), performs best on *F. japonica* (the only knotweed species present in that area). A new population of psyllids was collected from Murakami (Central Japan) where *F. japonica* and *F. sachalinensis* occur and the region has a similar climate to that of North-Western Europe. The performance of this population of psyllid was assessed on the three aforementioned knotweeds. The results of no-choice experiments indicated that the Murakami population performed best on *F.* × *bohemica* (juveniles developed the fastest and the number of emerged adults was twice as high as that recorded on the other two *Fallopia* hosts). The presence of psyllids from the Murakami population had an overall negative impact on final stem length for all knotweeds, though only *R. sachalinensis* and *R.* × *bohemica* showed a reduced rhizome biomass. Based on these results, psyllids from the population from Murakami is expected to have the largest impact in the field on *F.* × *bohemica* and *F. sachalinensis*.

Source: Camargo AM, Kurose D, Post MJC, Lommen STE (2022) A new population of the biocontrol agent *Aphalara itadori* performs best on the hybrid host *Reynoutria* x *bohemica*. *Biological Control* **175**, https://doi.org/10.1016/j.biocontrol.2022.105007

Pictures: *Reynoutria x bohemica*. https://gd.eppo.int/taxon/REYBO/photos

Additional key words: biological control **Computer codes:** POLCU, REYBO, REYSA, JP

2023/263 *Saururus cernuus* in the EPPO region: addition to the EPPO Alert List

Why
Saururus cernuus is an aquatic and semi-aquatic plant species native to North America and found in limited areas of the EPPO region. The EU LIFE RIPARIAS project has identified *S. cernuus* as an alert list species for Belgium with a high risk of introduction and establishment. The EPPO Panel on Invasive Alien Plants are seeking further information on any additional occurrences of *S. cernuus* in the EPPO region and reports of environmental and economic impacts.

Geographical distribution
EPPO region: Belgium, France (including Corsica), Germany, United Kingdom.
North America: Canada (District of Columbia, Ontario, Québec), Mexico, USA (Alabama, Arkansas, Delaware, Florida, Georgia, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Maryland, Michigan, Mississippi, Missouri, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Virginia, West Virginia, Wisconsin).
Oceania: New Zealand.

Morphology
An upright hairy perennial which can grow between 15-120 cm in height. Leaves are lance-shaped to nearly triangular with a cordate base. Flowers occur on an inflorescence up to 15 cm in length. *S. cernuus* has rhizomes, often with adventitious roots. Seeds brown, 1-1.3 × 0.7-1 mm, smooth.

Biology and Ecology
Saururus cernuus is an aquatic and semi-aquatic perennial plant, submerged or emerged. It flowers throughout the summer and sets seed from July to September. It can reproduce both vegetatively and via seed. In some countries in the EPPO region (e.g. Belgium), reproduction appears to be exclusively vegetative.

Habitats
Saururus cernuus is found in marshes, streams and along stagnant water bodies. It can be found in lotic and lentic conditions, growing as a submerged form in the water column or as an emerged form at the margin of waterbodies. It is tolerant of water level fluctuations. It can also be found in the understory of swamp forests. *S. cernuus* is tolerant of some shading but grows best under moderate to full sun.

Pathways for movement
Saururus cernuus is a popular ornamental plant and as such may be intentionally transported over long distances. It can also be spread unintentionally through dumping of garden waste. Additionally, accidental transport can occur from established populations by recreation equipment or machinery. The rhizomes contain aerenchyma tissue allowing them to float – which can promote natural spread.

Impacts
In France, *S. cernuus* is reported to be able to outcompete native plant species and contribute to the degradation of EU-listed habitats. In New Zealand, *S. cernuus* is considered a minor weed.

Control
As the species grows in and around water the use of chemical control methods is limited. Removal using machinery and physical uprooting has been used to control the species though all parts of the plant must be removed for this to be successful.

Sources
Branquart E, Adriaens T, Devisscher S, D'hondt B, Denys L, Dumortier A, Latli A, Packet J, Scheers K, Vanderhoeven S, Willeput R (2022) Belgian alert lists of alien aquatic plants and crayfish. Report prepared in support of implementing action A1 of the LIFE RIPARIAS project LIFE19 NAT/BE/000953, 15 pages.
Denys L, Packet J, Verhaegen F (2008) Een tweede groeiplaats van *Saururus cernuus* in Vlaanderen. *Dumortiera* **95**, 27-28.
RIPARIAS project (2023) https://www.riparias.be/
Swatek JH, Loos GH, Keil P, Haeupler H (2004) *Saururus cernuus* L., das Eidechsenschwänzchen, im Duisburg-Mülheimer Wald (Westliches Ruhrgebiet, Nordrhein-Westfalen). *Floristische Rundbriefe* **38**, 39-44.

Additional key words: invasive alien plant, alert list **Computer codes:** SUACE

2023/264 Cost-effectiveness of using drones to detect invasive alien tree species

Mapping and monitoring invasive species is critical for environmental management as part of restoration and conservation efforts. Additionally, the early detection of invasive alien plants is important to prevent establishment and spread. Mapping and monitoring has traditionally been conducted manually, which can be both time consuming and costly. Drones can be effectively used and may offer a better alternative. Invasive pine species (*Pinus taeda* and *P. elliottii*) have threatened the native biodiversity of the Parque Natural Municipal das Dunas da Lagoa da Conceição (Santa Catarina Island, Brazil) since their introduction in 1973. A lightweight unmanned aerial vehicle was used to locate pine seedlings and adult trees in an open coastal habitat. When an individual pine was identified, it was removed using manual or mechanical methods. This was then compared to the cost and time that it would take to manually search for individuals on the ground and remove them. The total cost and time for detecting and removing these invasive pines was estimated . When using a drone to locate pines and conduct targeted control activities, the cost was reduced to approximately one-third compared with traditional methods. The time needed to detect and remove invasive trees was more than seven times less compared with traditional active search and removal.

Source: Sühs RB, Ziller SR, Dechoum M (2023) Is the use of drones cost-effective and efficient in detecting invasive alien trees? A case study from a subtropical coastal ecosystem. *Biological Invasions*. https://doi.org/10.1007/s10530-023-03190-5

Additional key words: invasive alien plants **Computer codes:** PIUTD, PIUEL, BR

2023/265 Invasive alien plants in Russia

The first list of invasive alien plants in Russia was compiled for North-West Russia in 2003 and included 22 taxa. Following this, in 2006, work began on a Black Book of the Flora of Central Russia, resulting in a monograph of 52 invasive alien plants. Following this, additional blacklists for other regions in Russia were developed. In 2015, the Commission on

Invasive species of the Botanical Gardens of Russia proposed to develop a unified blacklist for Russia. A team of scientists worked to review all entries for invasive alien plants in Russia and a final list was prepared. The results detail that there are currently 584 invasive alien vascular plant species from 87 families recorded in Russia. Table 1 details the most widespread species based on the number of administration units in Russia the species is recorded in. The study categories these invasive alien plants into groups based on their level of invasiveness. Out of 584 species, 107 have been placed in the highest invasive category, as these species are invading natural and semi-natural habitats, and their establishment will change the structure of the ecosystems and disrupt their processes and functions.

Table 1. Widespread invasive alien plants in Russia

Species	Family	EPPO Status	Origin
Acer negundo	Sapindaceae	-	North America
Bidens frondosa	Asteraceae	EPPO List IAP	North America
Echinocystis lobata	Cucurbitaceae	-	North America
Elodea canadensis	Hydrocharitaceae	-	North America
Erigeron annuus	Asteraceae	-	North America
Erigeron canadensis	Asteraceae	-	North America
Heracleum sosnowskyi	Apiaceae	EPPO A2 List	Caucasus
Impatiens glandulifera	Balsaminaceae	EPPO List IAP	Asia (Himalayas)
Lupinus polyphyllus	Fabaceae	EPPO List IAP	North America
Solidago canadensis	Asteraceae	EPPO List IAP	North America

Source: Senator S, Vinogradova YK (2023) [Invasive plants of Russia: inventory results, distribution features and management issues]. *Advances of Modern Biology* (*Успехи современной биологии*) **143**(4), 393–402 (in Russian).

Additional key words: invasive alien plants

Computer codes: ELDCA, ACRNE, ECNLO, SOOCA, BIDFR, ERICA, LUPPO, IPAGL, ERIAN, RU

2023/266 13th NEOBIOTA conference (Lisbon, PT, 2024-09-03/06)

The 13th NEOBIOTA conference will be held from 3 to 6 September 2024, in Lisbon. NEOBIOTA 2024 will bring together scientists and environmental managers dedicated to the topic of invasive species. This event will share the most recent knowledge about these species, including prevention and control methods, involving society and various stakeholders. Readers can join the mailing list for pre-registration via the website.

Important dates (please note that adjustments may be made):

- Opening abstract submissions and registrations –19th February 2024
- Abstract submission deadline –19th April 2024
- Notification on abstracts acceptance: 3rd June 2024
- Early bird registration deadline –14th June 2024
- Announcement of final conference program –22nd July 2024
- Late registration deadline –26th July 2024

Source: NEOBIOTA website: https://www.neobiota2024.org/

Additional key words: invasive alien plants, conference