Express PRA for *Homona magnanima* – Interception –

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Inititation: Interceptions in Baden-Württemberg of *Taxus* from Takatsuki, Japan, in Brandenburg of *Taxus cuspidata* and in North Rhine-Westphalia of *Pinus thunbergii*, both from Yokohama, Japan.

Express Pest Risk Analysis	***Homona magnanima* Diakonoff**		
Phytosanitary risk for Germany	**high** ☐	**low – medium** ☒	
Phytosanitary risk for EU MS	**medium – high** ☒		**low** ☐
Certainty of assessment	**high** ☐	**medium** ☒	**low** ☐
Conclusion	The Oriental tea tortrix *Homona magnanima*, native to Japan, does not occur in the EU. So far, it is neither listed in the annexes to Regulation (EU) 2019/2072 nor by EPPO. *Homona magnanima* infests tea plants (*Camellia sinensis*), but also many other host plants, such as apple and pear trees, roses, rhododendron, avocados, grapes, eggplants, olive trees and ginkgo. In addition, conifers such as *Podocarpus macrophyllus* can be infested and severely damaged. The larvae spin neighboring leaves together and feed on the mesophyll of the rolled-up leaves. They can also cause damage to fruit. It cannot be excluded that *H. magnanima* can establish outdoors at least in warmer areas in Germany due to suitable climatic conditions; establishment in other, in particular in more southern EU Member States is possible. Due to its high damage potential for various host plants and its high degree of polyphagy, *H. magnanima* represents a significant phytosanitary risk for Germany and other EU Member States. Based on this risk analysis, it is assumed that *Homona magnanima* can establish in Germany or another Member State and cause significant damage. Thus, measures should be taken to prevent the risk of introducing this potential quarantine pest in accordance with Article 29 of Regulation (EU) 2016/2031.		
Preconditions for an Express PRA fulfilled?	Yes, the Oriental tea tortrix so far does not occur in the EU and can cause damage to various host plants.		

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Taxonomy, common name, synonyms	Lepidoptera, Tortricidae, *Homona*, *Homona magnanima* Diakonoff Photos: http://www.jpmoth.org/Tortricidae/Tortricinae/Homona_magnanima.html
EPPO Code	HOMOMA
Does a relevant earlier PRA exist?	No, only the previous version of this PRA (in German).
Distribution and biology	Japan, China, Taiwan, North Korea, South Korea (CABI, 2020), Vietnam (Razowski, 2008). Generally, *H. magnanima* has four generations, in warmer areas also five. *Homona magnanima* overwinters as a larva, a diapause does not occur according to CABI (2020). Yasuda (1972), on the other hand, states that *H. magnanima* enters diapause in the 4th or 5th larval stage, but does not create a hibernaculum and may continue to feed on warm winter days. The adults only fly, mate and oviposit in the evening. Mating begins 2 days after hatching and oviposition starts the following day. The lifespan of the adults is about 10 days in spring and 8-9 days in summer. A single female lays about 3-5 egg clusters with an average of 144 eggs per cluster, in total around 400-700 eggs. The larvae hatch after about 7-8 days in summer and 12-13 days in spring or autumn. The young larvae are very active and start moving and spreading soon after hatching. The larval period lasts on average 30 days and the pupal period about 7 days. Temperature has an impact on the growth rate of *H. magnanima*. The development rate of larvae and pupae increased up to 28°C, but decreased at 30°C (Mao und Kunimi, 1990). Studies predicting the impact of global climate change on *H. magnanima* in Kagoshima Prefecture in south-western Japan showed that a 2°C increase in average temperature between 1968 and 1998 had an impact on the phenology and abundance of the pest. The higher average temperature led to an early emergence of *H. magnanima* compared to previous years; the number of generations also increased (Yamaguchi et al., 2001).
Are host plants present in the PRA area? If so, which?	Yes. The Oriental tea tortrix is very polyphagous. According to Yasuda (1972) it can attack 35 genera from 26 families (both gymnosperms and angiosperms), according to Noguchi

	(1990) it attacks 29 families and 31 species. The closely related species *Homona issikii*, on the other hand, only infests conifers (but apparently restricted to *Cryptomeria fortunei* and *C. japonica*). In detail: CABI (2020) lists *Arachis* (peanuts), *Camellia sinensis* (tea), *Chrysanthemum indicum* (chrysanthemums), *Citrus, Diospyros kaki* (kaki, persimmon)*, Eurya, Glycine, Lithocarpus edulis, Malus domestica* (apple)*, Nandina domestica, Paeonia, Paulownia tomentosa, Podocarpus* (yew), *Prunus, Prunus avium* (sweet cherry)*, Pyrus* (pears), *Rhododendron, Rosa, Solanum melongena* (eggplant) as host plants, all or almost all of which occur in the PRA area as ornamentals or crop plants. Nishi et al. (2019) also name *Persea americana* (Avocado) as a host plant, Meijerman and Ulenberg (2000) and Yasuda (1972) list additionally *Abies firma, Camellia japonica, Castanopsis sp., Cinnamomum camphora, Citrus unshiu, Cleyera japonica, Euonymus japonica, Glochidion obovatum, Glycine max, Ilex crenata, Juglans ailanthifolia, Larix leptolepis, Ligustrum japonicum, Malus pumila, Melia azedarach, Metasequoia glyptostroboides, Myrica rubra, Olea europeae, Paeonia suffroticosa, Pieris japonica, Pittosperum tobira, Podocarpus macrophyllus, Podocarpus nagi, Prunus persica, Prunus x yedoensis, Punica granatum, Pyrus simoni, Quercus phillyraeoides, Quercus acutissima, Quercus variabilis, Rosa, Rhus japonica, Salix sp., Taxus cuspidata* (see also reason for two of the interceptions)*, Vaccinium bracteatum, Vitis, Viburnum awabuki* and *Wisteria floribunda.* Jinbo et al. (2014) also mention *Cinnamomum tenuifolium, Hedera rhombea, Ligustrum lucidum, Neolitsea sericea, Rhododendron x pulchrum* 'Oomurasaki'*, Stauntonia hexaphylla* and *Zanthoxylum piperitum. Wenling (2019)* also lists *Hibiscus mutabilis, Photinia x fraseri, Phoebe zhennan* and *Quercus serrata. Homona magnanima* also attacks *Osmanthus fragrans* (Nohira and Awano, 1977), *Ginkgo biloba* (Lin et al., 2022), and *Gardenia jasminoides* (Kanaya et al. 2024). In Korea, *H. magnanima* is an important pest of olive trees (medium to high occurrence, severe damage to shoots and leaves; Choi et al. 2023). According to the Nara Prefectural Agricultural Experiment Station (1975), it also damages *Photinia glabra, Laurus nobilis, Rhaphiolepis indica, Quercus glauca,* and *Lagerstroemia indica.*

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Transfer from consignment to host plant	Larvae are very polyphagous (number and diversity of host plants) and very active, and adults are good flyers (CABI, 2020). Therefore, transfer from the consignment to host plants is possible.
Is a vector/ further plant needed for host alternation? Which? Distribution?	No.
Climate in distribution area comparable to PRA area?	Yes. The moth occurs from temperate to tropical zones (Sato et al. 1980), in Japan everywhere except Hokkaido (Noguchi, 1990). The climate in the areas where *H. magnanima* is present corresponds primarily to the Köppen-Geiger climate zones Cfa and Cfb; it is temperate, warm temperate to subtropical (e.g. Japan: Kantō region on Honshu: temperate; Nara Prefecture: warm temperate, Kagoshima on Kyushu: subtropical; Taiwan: mountainous regions: temperate, northern and central regions: subtropical). The prevailing climate in Germany and the EU is the Cfb climate (MacLeod and Korycinska, 2019).
If no, are host plants present in protected cultivation?	Not relevant.
Expected damage in the PRA area	Damage is very likely to be expected. *Homona magnanima* is an economically important tea pest in its area of distribution (e.g. Lee et al., 2020). The larvae's webbing together of leaves with subsequent feeding on the mesophyll and their massive feeding activity cause severe damage to the leaves and young shoots of the host plants. This results in leaf dieback, defoliation and crop loss. The economic damage limit for *H. magnanima* in tea fields was determined to be 4 larvae/m² (CABI, 2020, with reference to other sources). According to CABI (2020), *H. magnanima* does not attack the fruits of trees, but there are photos of the larvae infesting persimmons and grapes (Meijerman and Ulenberg, 2000) that contradict this statement. *Homona magnanima* has also been shown to occur in outdoor avocado cultivation in Kagoshima (Kyushu, Japan, subtropical climate) – the larvae prefer to feed on fruits, flower stalks and shoots and can cause severe fruit damage (Nishi et al., 2019). Australia regulates the moth as a quarantine pest, also pointing out the ability of the larvae to chew through protective bags to reach fruit (AQIS, 1998,

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	Department of Agriculture, Water and the Environment, 2021). Furthermore, according to the Nara Prefectural Agricultural Experiment Station (1975), *H. magnanima* is the most common lepidopteran pest on *Podocarpus macrophyllus*. The infestation prevents the growth of new shoots and causes significant damage to young trees. Lin et al., 2022 describe damage to *Ginkgo biloba*. The EU has no significant tea-growing areas. However, damage could be caused to a large number of other host plants and, due to the absence of the most important host plant, there is a risk that these other host plants would be more severely damaged than in the current distribution areas of the Oriental tea tortrix, where tea is grown in large quantities. In Japan, the damage is most severe from July to August, and in warm regions, it continues into the winter (Nara Prefecture Agricultural Research Station, 1975). Risk of introduction via bonsai: even if no significant damage to *Pinus* is known, there is still a high risk that *H. magnanima* is transferred from the infested/contaminated bonsai to important host plants.
Relevance for organic farming	There are various management options that could be applied in organic farming (pheromones, but see below, Mochizuki et al., 2001, natural enemies, granulosis virus; Nakai, 2009, Sato et al., 1980), but they are not suitable for achieving complete eradication.
Is an infestation easy to eradicate?	In principle, eradication with insecticides is possible if the moth is not yet widespread and the abundance is low. However, *H. magnanima* has developed resistance to a number of insecticides (AQIS, 1998, Nakai, 2009). For this reason, IPM measures are used in infested areas. Control with the help of pheromone traps is also possible; in Japan, damage was kept at a low level until the late 1980s. However, after 12 years of use in tea plantations in Shizuoka Prefecture, Japan, the effectiveness decreased significantly. Here too, resistance to the pheromone has probably developed (Mochizuki et al., 2001).
Remarks	This risk analysis is subject to a medium degree of uncertainty because damage caused by *H. magnanima* has so far been reported mainly on tea plants and it is not clear to what extent significant damage to other host plants could

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	occur in a new area of distribution. However, significant damage was also found recently on avocados, grapes and kaki (Nishi et al., 2019). More recent literature (Lin et al., 2022) also describes damage to *Ginkgo biloba*, olive trees (Choi et al., 2023) and *Gardenia jasminoides* (Kanaya et al. 2024). In addition, although no tea is grown there, Australia has regulated the species as a quarantine pest (AQIS, 1998, Department of Agriculture, Water and the Environment, 2021). Control is becoming increasingly difficult (due to the development of resistance both to insecticides and pheromones. Damage to host plants in the EU cannot be ruled out. For these reasons, *H. magnanima* is classified as a potential quarantine pest. *Homona magnanima* is used to study so-called "male killing" (MK). MK refers to the killing of male offspring by microorganisms during embryogenesis. It is a strategy for improving the fitness of the microorganisms. Two embryonic MK bacteria, namely *Wolbachia* (Alphaproteobacteria) and *Spiroplasma* (Mollicutes), as well as a larval MK virus, Osugoroshi virus (OGV; Partitiviridae), have been identified in the moth (see e.g. Arai et al., 2023).
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Figures 1-4: Larvae of *Homona magnanima*

Figure 1. Larva of the Oriental tea tortrix (*Homona magnanima*). Size representation, length 26 mm; diameter approx. 5 mm. (Photo: Olaf Zimmermann, LTZ Augustenberg)

Figure 2. Larva of the Oriental tea tortrix (*Homona magnanima*). Damage to yew (*Taxus* sp.) caused by larval feeding, webs (Photo: Olaf Zimmermann, LTZ Augustenberg, Germany).

Figure 3. Larva of the Oriental tea tortrix (*Homona magnanima*) on yew (Taxus sp.) Larval head with mouthparts (Photo: Olaf Zimmermann, LTZ Augustenberg, Germany)

Figure 4. Larva of the Oriental tea tortrix (*Homona magnanima*) on Japanese black pine (*Pinus thunbergii*). (Photo: Christian Heinendirk, Landwirtschaftskammer NRW, Germany)