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SLU Risk Assessment of Plant Pests

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Is *Matsucoccus matsumurae* present in Sweden?

1 Background

EFSA is currently performing a pest categorisation of *Matsucoccus matsumurae* (Kuwana) [EPPO code: MATSRE]. *Matsucoccus matsumurae* is a species of scale insect (Japanese pine bast scale or red pine scale) reported mainly from Asia and North America. According to a commodity risk assessment of bonsai plants from China by EFSA (2021) the species was also reported as present in Sweden, citing ScaleNet (García Morales et al. 2022), which cites Gertsson (2001). EFSA requested information from the Swedish NPPO to verify the pest status (pers. comm. Swedish Board of Agriculture).

SLU Risk Assessment of Plant Pests was requested by the Swedish Board of Agriculture to evaluate whether *Matsucoccus matsumurae* should be regarded to be present in Sweden. In addition, information should be provided whether any measures are applied against the spread of this species in Sweden.

2 Methodology

Information was obtained from both scientific and grey literature. Searches were performed in ISI Web of Sciences, Google Scholar and different specific databases, i.e., CABI Crop Protection Compendium (CABI 2022), SLU Artfakta (SLU Artdatabanken 2022) and ScaleNet (García Morales et al. 2022).

3 Presence of *Matsucoccus matsumurae* in Sweden

In the annotated checklist of scale insects in Sweden by Gertsson (2001), *M. matsumurae* (syn. *M. pini*) is listed as present in Sweden and details that the scale was only reported from Abisko in 1955 and 1964 citing Ossiannilsson (1959, 1972). Ossiannilsson reports finding *M. pini* (Green) in Abisko in 1955 (one female) and again in high numbers on *Pinus sylvestris* in 1964 (Ossiannilsson 1959; 1972). He reports the location as the only one he found for the species. In a later article, Gertsson (2011) describes several observations of *M. pini* in Sweden and in that article he refers to the findings of Ossiannilsson from 1959 and 1972 as *M. pini* (no synonyms

listed). Moreover, in an account of the scale insect fauna of Fennoscandia and Denmark, Gertsson (2013) only lists one species of the family Matsucoccidae as occurring in the region, which is *M. pini* (Green) (no synonyms listed). Finally, Gertsson has verified that *M. matsumurae* has never been found in Sweden whereas *M. pini* appears to be common (Gertsson 2011; C.-A. Gertsson pers. comm. 5 April 2022).

As mentioned above, ScaleNet (García Morales et al. 2022) listed *M. matsumurae* as present in Sweden but that was based on the article by Gertsson (2001) where *M. matsumurae* was considered a synonym of *M. pini*. It should be noted that Sweden was removed from the geographic distribution of *M. matsumurae* in ScaleNet on April 8, 2022 (García Morales et al. 2022). Other sources that describe the distribution of *M. matsumurae* does not include Sweden in their distribution ranges, i.e., Foldi (2004) and CABI (2022a).

Whether *M. matsumurae* and *M. pini* should be regarded as two distinct species or as conspecific has been under discussion (Kosztarab & Kozár 1988; Foldi 2004; Booth and Gullan 2006). Foldi (2004) redescribed the genus *Matsucoccus* and provides a morphological description and a key that separates the two species. According to Foldi (2004), *Matsucoccus matsumurae* (Japanese pine bast scale) is reported as present in USA, China, Korea, Japan, Russia as well as in Ukraine and is restricted to areas with moderate temperatures (citing McClure (1983)). *Matsucoccus pini* (European pine bast scale) is reported from across Europe and in Marocco (Foldi 2004). However, given the high variation of the morphological characteristics and the life history within the two species the taxonomy is described as uncertain and thus there is a need to analyse them using molecular methods (Foldi 2004; Booth and Gullan 2006). DNA analyses have been conducted for *M. matsumurae* and synonyms, but did not include *M. pini* (Booth and Gullan 2006; Choi et al. 2019; Ahmed et al. 2020).

Since there is no definitive data for their synonymy *M. matsumurae* and *M. pini* are listed as two separate species in ScaleNet (García Morales et al. 2022; B. Denno & D. Miller, pers. comm. 6 April 2022); also CABI (2022a, b) and EPPO (2022) lists the two as separate species¹. In contrast SLU Artfakta (SLU Artdatabanken 2022) lists *M. matsumurae* as a synonym of *M. pini*, which is considered established in Sweden.

Conclusion

To conclude, no original reports of observations of *M. matsumurae* in Sweden were found. All original reports refer to *M. pini*. The listing of *M. matsumurae* in Gertsson (2001) is due to the assumption of the two as synonyms at the time of that reporting. Thus, based on the assumption that *M. matsumurae* and *M. pini* are two separate species, there is no support that *M. matsumurae* is present in Sweden.

¹*Matsucoccus matsumurae* (Kuwana, 1905) is listed with the synonyms *Matsucoccus liaoningensis*, *Matsucoccus resinosae* Bean & Godwin 1955, *Matsucoccus thunbergiana* Miller & Park 1987 and *Xylococcus matsumurae* Kuwana 1905 (CABI 2022a; EPPO 2022; García Morales et al. 2022) and *M. pini* (Green 1925) is listed with the synonym *Kuwania pini* Green 1925 (CABI 2022b; García Morales et al. 2022).

4 Measures against the pest in Sweden

No measures have been taken against *M. matsumurae* (nor *M. pini*) in Sweden.

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7 References

- Ahmed, M. Z., Ray, C. H., Moore, M. R., & Miller, D. R. (2020). The *Matsucoccus* Cockerell, 1909 of Florida (Hemiptera: Coccoomorpha: Matsucoccidae): Potential pests of Florida pines *Insecta Mundi* 0810: 1–31.
- Booth, J. M., & Gullan, P. J. (2006). Synonymy of three pestiferous *Matsucoccus* scale insects (Hemiptera: Coccoidea: Matsucoccidae) based on morphological and molecular evidence. *Proceedings of the Entomological Society of Washington*, 108 (4): 749-760.
- CABI (2022a) Crop Protection Compendium, Datasheet, *Matsucoccus matsumurae*, LINK: <https://www.cabi.org/cpc/datasheet/75314> [Accessed 2022-04-06]
- CABI (2022b) Crop Protection Compendium, Datasheet, *Matsucoccus pini*, LINK: <https://www.cabi.org/cpc/datasheet/32662> [Accessed 2022-04-06].
- Choi, J., Cha, D., Kim, D. S., & Lee, S. (2019). Review of Japanese pine bast scale, *Matsucoccus matsumurae* (Kuwana)(Coccoomorpha: Matsucoccidae), occurring on Japanese black pine (*Pinus thunbergii* Parl.) and Japanese red pine (*P. densiflora* Siebold & Zucc.) from Korea. *Forests*, 10(8), 639.

EFSA Panel on Plant Health (PLH), Bragard, C., Baptista, P., Chatzivassiliou, E., Di Serio, F., Jaques Miret, J. A., ... & Gonthier, P. (2022). Commodity risk assessment of bonsai plants from China consisting of *Pinus parviflora* grafted on *Pinus thunbergii*. EFSA Journal, 20(2), e07077.

EPPO (2022) EPPO Global Database (available online). <https://gd.eppo.int>

Foldi, I. (2004) The Matsucoccidae in the Mediterranean basin with a worldlist of species (Hemiptera: Sternorrhyncha: Coccoidea), Annales de la Société Entomologique de France, 40:2, 145-168, LINK: <https://doi.org/10.1080/00379271.2004.10697412>

Gertsson, C.-A. (2001) An annotated checklist of the scale insects (Homoptera: Coccoidea) of Sweden. [Förteckning över Sveriges sköldlöss.]. Entomologisk Tidskrift 122 (3): 123-130. Lund, Sweden 2001. ISS 00 I 3-886x.

Gertsson, C.-A. (2005) Spår av en intressant sköldlusart funna på skånska tallar. FaZett 18: 25-28.

Gertsson, C.-A. (2011) Nya arter och nya landskapsfynd av sköldlöss (Hemiptera, Coccoidea) från Sverige fram till år 2010. [New species and new province-records of scale insects from Sweden (Hemiptera: Coccoidea) up to the year 2010.]. Entomologisk Tidskrift 132 (1): 39-45. Uppsala, Sweden 2011. ISSN 0013-886x.

Gertsson, C.-A. (2013). A zoogeographical analysis of the scale insect (Hemiptera, Coccoidea) fauna of Fennoscandia and Denmark. Norwegian Journal of Entomology 60, 81–89.

McClure, M.S. (1983) Temperature and host availability affect the distribution of *Matsucoccus matsumurae* (Kuwana) (Homoptera: Margarodidae) in Asia and North America, Annals of the Entomological Society of America, Volume 76 (4): 761–765, <https://doi.org/10.1093/aesa/76.4.761>

Ossiannilsson, F. (1959) Bidrag till kännedom om den svenska sköldlusfaunan (Hom. Coccoidea) II. [Contributions to the Knowledge of the Swedish Coccid Fauna II.]. Opusc. Ent. 24: 193- 201.

Ossiannilsson, F. (1972). Till kännedom om Abiskotraktens Hemiptera. Entomologisk Tidskrift 93: 88-89.

García Morales M, Denno BD, Miller DR, Miller GL, Ben-Dov Y, Hardy NB. 2022. *ScaleNet: A literature-based model of scale insect biology and systematics*. Database. doi: 10.1093/database/bav118. <http://scalenet.info>. [Accessed 2022-04-05]

SLU Artdatabanken (2022) Artfakta, <https://namnochslaktskap.artfakta.se/taxa/256653/details?lang=en> [Accessed 2022-04-01]