Express PRA[1)] for *Aceria kuko*

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Initiation: request of the Bayerische Landesanstalt für Landwirtschaft suspecting the occurrence on Goji-berries in Bavaria

Express - PRA	***Aceria kuko***		
Phytosanitary risk for Germany	**high** ☐	**medium** ☒	**low** ☐
Phytosanitary risk for EU-MS	**high** ☐	**medium** ☒	**low** ☐
Certainty of Assessment	**high** ☐	**medium** ☒	**low** ☐
Conclusion	Up to now the gall mite *Aceria kuko* which is common in China occurs only sporadically in Germany or the European Union. In a pest risk assessment prepared by the Food and Environmental Research Agency (Fera) in 2010 the eradication of the pest that had been introduced into the UK could not be confirmed. Also for Baden-Württemberg it is not yet known whether the infestation, which was firstly detected in 2011, has been eradicated. Detailed information on the actual spread in Germany and other Member States is not available. Without containment measures *Aceria kuko* may present a phytosanitary risk mainly for the commercial cultivation of Goji-berries and pepper. Economic relevance in case of introduction has to be expected mainly in respect to field growing of pepper in other European countries. Based on this risk analysis it has to be assumed that the gall mites could establish in Germany or other Member States and cause considerable damage. At the moment the economic relevance cannot be estimated because of lack of data. Hence measures for the control and on the prevention of the introduction of *Aceria kuko* should be met according to § 4a of the German Plant Inspection Order (PBVO). Known infested sites should be subject to an intensive eradication programme.		
Taxonomy[2)]	Acari (mites); Eriophyidae (gall mites)		
Trivial name	Goji gall mite		
Synonyms	*Eriophyes kuko; Aceria tjyingi; Eriophyes tjyingi; Eriophyes parawagnoni; Aceria parawagnoni*; Aceria paramacrodonis**		

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	*not universally accepted (Anderson, H. & Ostoja-Starzewski, J. C., 2010)
Does a relevant earlier PRA exist?	Yes Fera Pest Risk Analysis for *Aceria kuko* (Anderson, H. & Ostoja-Starzewski, J. C., 2010).
Biology	Size: 0.17 – 0.25 mm; vermiform, two pairs of forelegs, adults light salmon coloured, juvenile stages cream to white, eggs uncoloured; thermophile species, optimal development temperature between 25 – 35°C, females lay app. 28 eggs within 6 days; period of development to maturity app. 7.5 – 12 days, life time of the adults app. 25 – 30 days; at high temperatures app. 6 to 7 overlapping generations are possible (Ostoja-Starzewski, J.C., 2009), at the moment no data on the necessary minimum temperature for survival are available; however, an activity of the gall mites below 0°C was described (Anderson, H. & Ostoja-Starzewski, J. C., 2010).
Is the pest a vector?[3)]	Not known.
Is a vector needed?[4)]	No
Host plants	Goji-berry (*Lycium chinense* Miller; *Lycium barbarum* L.), black night-shade (*Solanum nigrum* L.), pepper (*Capsicum anuum* L.); susceptibility of potatoes and tomatoes (*Solanum lycopersicum*) or other Solanaceae not yet confirmed (Anderson, H. & Ostoja-Starzewski, J. C., 2010).
Symptoms[5)]	Leaf galls with 3 – 5mm diameter with yellowish-greenish colour on the underside, on the leaf surface rather reddish, in the galls larger number of mites (Ostoja-Starzewski, J.C., 2009).
Presence of host plants in Germany[6)]	Limited cultivation of Goji-berries, sporadically in gardens; cultivation of peppers in small amounts under glass, in total 39 hectare (BMELV 2012) also in gardens; black night-shade distributed as wild plants in Germany.
Presence of host plants in the MS[7)]	Several smaller cultivation areas of Goji-berries in Spain, Switzerland, Austria; cultivation of pepper under glass in other European countries and outdoors in Spain and the Mediterranean region.
Known infested areas[8)]	China, Japan, Republic of Korea, Taiwan Possibly wider spread in UK (Anderson, H. & Ostoja-Starzewski,

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	J. C., 2010). Occurring in Germany in Baden-Württemberg (EPPO, PQR).
Pathways[9)]	Introduction via infested host plants, however, the importation from third countries into the European Union of Solanaceae intended for planting is prohibited according to Dir. 2000/29/EC.
Natural spread[10)]	Slowly via gusts, rather limited to neighbouring plants.
Expected establishment and spread in Germany[11)]	The plant pest has not yet been eradicated in Baden-Württemberg. Presumably it has the potential to establish in Germany, probably further spread.
Expected establishment and spread in the MS[12)]	An introduction within the EU is possible via transport with infested host plants, probably establishment in warmer Member States.
Known damage in infested areas[13)]	Damage on *Lycium chinense* is known from China and could also be observed in UK and in Baden-Württemberg; the galls which are created by the mites may cause damage on the leaf tissue, whereby the photosynthesis rate is reduced and crop loss has to be expected.
Limitation of the endangered area in Germany	All over Germany since Goji-berries are often planted in gardens, black night-shade is spread throughout Germany.
Expected damage in endangered area in Germany[14)]	Comparable with damage in infested areas.
Expected damage in endangered area in MS[15)]	See Germany, mainly in areas with field growing of pepper.
Control feasibility and measures[16)]	At the moment solely the uprooting and destruction of infested plants is known as an effective measure.
Detection and diagnosis [17)]	Due to the small size in most cases an infestation is not detected before appearance of the galls; microscopic identification by means of morphologic characteristics like the drawing on the dorsal tergite and the structure of the empodium (Ostoja-Starzewski, J.C., 2009). Up to now only the overwintering within the galls is described (Kim, 1968), however, in UK *Aceria kuko* could be detected on imported defoliated plants. It is assumed that also an overwintering below bud scales and bark pieces is common (Ostoja-Starzewski, J.C., 2009).

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Remarks	Without control measures an establishment in Germany has to be expected. An introduction mainly has to be expected via infested plant material. Presumably an infestation is only detected when the first galls are present.
Literature	Anderson, H. & Ostoja-Starzewski, J. C. (2010): Fera Pest Risk Analysis for Aceria kuko, The Food and Environment Research Agency; http://www.fera.defra.gov.uk/plants/plantHealth/pestsDiseases/documents/Aceriakuko.pdf BMELV (2012): Ertragslage Garten- und Weinbau 2011, Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz; http://berichte.bmelv-statistik.de/GBB-2000000-2011.pdf) in German Kim, C. H. (1968): Some biological notes on Eriophyes kuko Kishida. Its biology and life history. Korean Journal of Plant Protection 5/6: 59 - 63 Ostoja-Starzewski, J.C. (2009): Goji gall mite Aceria kuko (Kishida); Plant Pest Notice; Central Science Laboratory; http://secure2.csl.gov.uk/plants/publications/plantHealth/documents/PPN55.pdf

Fig. 1: Galling on Goji-berry [Photo: Central Science Laboratory, 2008]

Fig. 2: Galling on Goji-berry on the leaf surface [Photo: Central Science Laboratory, 2008]

Fig. 3: Deformation on leaves of pepper (Capsicum annum) caused by *Aceria kuko* [Photo: Central Science Laboratory, 2008]

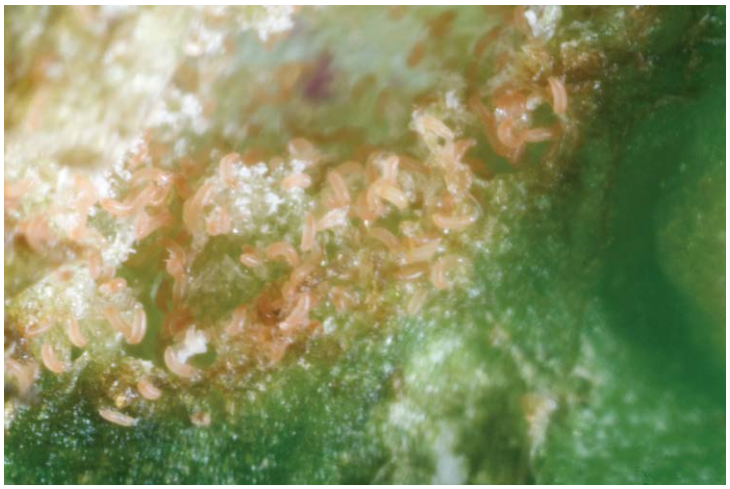

Fig. 4: Different stages of *Aceria kuko* in a gall [Photo: Central Science Laboratory, 2008]

Explanation

1) Compilation of the most important directly available information allowing a first preliminary estimation of the phytosanitary risk. This short assessment is necessary for the decision on a notification to EU and EPPO as well as the preparation of a complete risk analysis, for the information of the countries and as a basis for the possible initiation of eradication measures. Regarding the phytosanitary risk especially the possibility of the introduction into and spread in Germany and the Member States as well as possible damage are taken into account.

2) Taxonomic classification – also subspecies; in case that the taxonomical classification is uncertain the JKI-scientist initiates the taxonomic classification, as far as possible.

3) If so, which organism (which organisms) is (are) transmitted and does it (do they) occur in Germany / the MS?

4) If so, which organism serves as a vector and does it occur in Germany / the MS?

5) Description of the pattern of damage and the severity of the symptoms/damage on the different host plants

6) Presence of the host plants in protected cultivation, open field, amenity plantings, forest.
Where, in which regions are the host plants present and to which extent?
How important are the host plants (economical, ecological,..)? Possible origin

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How important are the host plants (economical, ecological,..)? Possible origin

8) f. e. acc. to CABI, EPPO, PQR, EPPO Datasheets

9) Which pathways are known for the pest and how important are they for the possibility of introduction? Primarily the transport of the pest over long distances is meant, normally with infested traded plants, plant products or other contaminated articles. This does not comprise the natural spread resulting from introduction.

10) Which pathways are known for the pest and of which relevance are they in respect of the possibility of spread? In this case the natural spread resulting from introduction is meant.

11) under the given prevalent environmental conditions

12) under the given prevalent environmental conditions (native areas and areas of introduction)

13) Description of the economic, ecological/environmental relevant and social damage in the area of origin resp. areas of occurrence up to now

14) Description of the economic, ecological/environmental relevant and social damage to be expected in Germany, as far as possible and required, differentiated between regions

15) Description of the economic, ecological/environmental relevant and social damage to be expected in the EU/other Member States, as far as possible and required, differentiated between regions

16) Can the pest be controlled? Which possibilities of control are given? Are plant health measures conducted in respect to this pest (in the areas of current distribution resp. by third countries)?

17) Description of possibilities and methods for detection. Detection by visual inspections? Latency? Uneven distribution in the plant (sampling)?