



## Quick scan for *Pseudomonas kitaguniensis*

National Plant Protection Organization, the Netherlands

Quick scan number: QS2024BAC001

Quick scan date: 9 October 2024

No.	Question	Quick scan answer for <i>Pseudomonas kitaguniensis</i>
1.	What is the scientific name (if possible up to species level + author, also include (sub)family and order) and English/common name of the organism? <i>Add picture of organism/damage if available and publication allowed.</i>	<i>Pseudomonas kitaguniensis</i> Sawada <i>et al.</i> 2020 Family <i>Pseudomonadaceae</i> ; Order <i>Pseudomonadales</i> (bacterial) rot disease of Welsh onion ( <i>Allium fistulosum</i> ).
2.	What prompted this quick scan? <i>Organism detected in produce for import, export, in cultivation, nature, mentioned in publications, e.g. EPPO alert list, etc.</i>	Naktuinbouw (the Netherlands Inspection Service for Horticulture) isolated <i>Pseudomonas kitaguniensis</i> from symptomatic young leek plants ( <i>Allium ampeloprasum</i> var. <i>porrum</i> propagation material) at several sites in the south of the Netherlands. The plants showed burned/whitish leaf tips regularly flanked by yellow margins (Figs. 1-2). No inoculations experiments were performed but it is presumed that <i>P. kitaguniensis</i> had caused these symptoms. <i>Pseudomonas kitaguniensis</i> was not known to be present in the EU.
3.	What is the risk assessment area?	The risk assessment area is the territory of the European Union (EU 27)
4.	What is the current area of distribution?	Until now <i>P. kitaguniensis</i> had only been isolated from plants in Japan and New Zealand (Sawada <i>et al.</i> 2022). The findings in the Netherlands are the first findings outside these countries.
5.	What are the host plants?	<i>Pseudomonas kitaguniensis</i> has been isolated from Welsh onion ( <i>Allium fistulosum</i> ), kiwi ( <i>Actinidia deliciosa</i> ), and peach ( <i>Prunus persica</i> ; Sawada <i>et al.</i> 2020, Sawada <i>et al.</i> 2022, Tsuji <i>et al.</i> 2024). This is the first time <i>P. kitaguniensis</i> was found in leek.

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6.	<p>Does the organism cause any kind of plant damage in the current area of distribution and/or does the consignment demonstrate damage suspected to have been caused by this organism?  <i>Yes/no + plant species on which damage has been reported + short description of symptoms.</i>  <i>Please indicate also when the organism is otherwise harmful (e.g. predator, human/veterinary pathogen vector, etc.).</i></p>	<p>Yes, in Japan <i>P. kitaguniensis</i> causes water-soaking rot on leaves, and soft rot on leaf sheathes and bulb on Welsh onion (<i>A. fistulosum</i>; Sawada <i>et al.</i> 2020, Tsuji <i>et al.</i> 2024). Information on yield losses caused by <i>P. kitaguniensis</i> has not been found. Findings on kiwi and peach appear to be incidental and no severe damage has been reported.</p>
7.	<p>Assess the probability of establishment in the Netherlands (NL) (i.e. the suitability of the environment for establishment).</p> <ol style="list-style-type: none"> <li>In greenhouses</li> <li>Outdoors</li> <li>Otherwise (e.g. storage facilities, human environment)</li> </ol>	<p>The <i>Pseudomonas</i> genus contains a very large and diverse group of bacteria that can be found all around the world in highly diverse habitats. <i>Pseudomonas kitaguniensis</i> has only been described as a species in 2020 and there is no information available on the spread and survival capacity of this specific species. However, <i>Pseudomonas</i> species generally do not require very specific conditions for survival. Additionally, <i>Pseudomonas</i> bacteria might be epiphytically present on the plant without any symptoms and only cause disease when the optimal conditions are met.</p> <p><i>Pseudomonas kitaguniensis</i> has been found in the northern regions of Japan where it affects Welsh onion during spring. In this area winters are colder and summers are warmer than in the Netherlands. In inoculation experiments on Welsh onion symptoms were already observed at 10°C. It seems that especially the wet but still relative cold conditions during spring favour the pathogen and during this period severe symptoms can occur (Sawada <i>et al.</i> 2020, Tsuji <i>et al.</i> 2024). The outdoor conditions in the Netherlands, especially during wet springs, are therefore likely to be favourable for <i>P. kitaguniensis</i>. Conditions in greenhouses or other facilities are generally warmer and/or drier and are expected to be less favourable for this bacterium.</p>
8.	<p>Assess the probability of establishment in the EU (i.e. the suitability of the environment for establishment).</p>	<p>The findings in the Netherlands indicate that <i>P. kitaguniensis</i> can at least establish in part of the EU. A detailed assessment of the area of potential establishment in the EU is not part of this Quick scan.</p>
9.	<p>What are the possible pathways that can contribute to spread of the organism after introduction? How rapid is the organism expected to spread (by natural dispersal and human activity)?</p>	<p>In the Netherlands, the pathogen was found in young leek plants (propagation material) growing in the south of the country. Infested machinery can spread the disease within and between fields especially under wet and cool weather conditions. Mowing of leek plants (which is common practice in the production of leek transplants) is likely to spread the bacterium through the field. Spread over longer distances may occur by trade/movement of infected plants and possibly also by contaminated seeds. There is no information available on natural dispersal of <i>P. kitaguniensis</i>.</p>
10.	<p>Provide an assessment of the type and amount of direct and indirect damage (e.g. lower quality, lower production, export restrictions, threat to biodiversity, etc.) likely to occur if the organism would become established in NL and the EU, respectively?</p>	<p>In the Netherlands, <i>P. kitaguniensis</i> was found in young symptomatic leek plants belonging to different cultivars. This was the first time this pathogen was found in leek. Before, it had only been reported to cause serious damage in Welsh onion. Symptoms consisted of burned/whitish leaf tips regularly flanked by yellow margins (Figs. 1-2). The sickle shaped leaves, typical for <i>P. syringae</i> pv. <i>porri</i>, were not observed. Under favourable weather conditions serious damage to young leek plants may be expected.</p>

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		However, it was observed that when weather condition became warmer and drier leek plants quickly recovered. This year's leek season is still ongoing so the ultimate impact of the <i>P. kitaguniensis</i> outbreak at leek propagators on the production at leek growers is still unknown. So far, no damage was reported at leek growers (Naktuinbouw 2024).
11.	Has the organism been detected on/in a product other than plants for planting (e.g. cut flowers, fruit, vegetables)? <i>If "no", go to question 13</i>	No
12.	If the organism has been found on/in a product other than plants for planting (e.g. cut flowers, fruit, vegetables), what is the probability of introduction (entry + establishment)? <i>Only to be answered in case of an interception or a find.</i>	
13.	Additional remarks	The origin of the infestation is unknown. Seed was most likely not the source of the outbreak. Twenty-two seed lots of leek, most of them linked to the outbreaks, were tested but <i>P. kitaguniensis</i> was not detected. The bacterium was found on several locations of producers of transplants in the south of the Netherlands where the production is concentrated. The bacterium might already have been present for a longer time without being noticed. The spring of 2024 was unusual wet in the Netherlands which may have contributed to the outbreaks of <i>P. kitaguniensis</i> .
14.	Summary and conclusions	<ul style="list-style-type: none"> <li>• This Quick scan was prompted by the first finding of the bacterium <i>Pseudomonas kitaguniesis</i> in the Netherlands. This bacterium was not known to be present in the EU.</li> <li>• <i>Pseudomonas kitaguniesis</i> is a recently described species and was previously only known from Japan and New Zealand. The origin of the infestation in the Netherland is unknown.</li> <li>• <i>Pseudomonas kitaguniesis</i> was already known as a pathogen of Welsh onion (<i>Allium fistulosum</i>) and is probably also a pathogen of leek (<i>Allium ampeloprasum</i> var. <i>porrum</i>). Damage may especially occur during cool and wet conditions. However, the impact (% yield loss) that can be expected is highly uncertain. Leek plants appeared to recover when the weather became warmer and drier.</li> </ul>
15.	References	<p>Naktuinbouw provided information on symptoms, seed testing and impact for leek propagators and growers (2024).</p> <p>Sawada H, Fujikawa T, Nishiwaki Y &amp; Horita H (2020) <i>Pseudomonas kitaguniensis</i> sp. nov., a pathogen causing bacterial rot of Welsh onion in Japan. <i>International Journal of Systematic and Evolutionary Microbiology</i>. <b>70</b>, 3018-3026.</p> <p>Sawada H, Fujikawa T &amp; Satou M (2022) <i>Dismantling and reorganizing Pseudomonas marginalis sensu lato</i>. <i>Plant Pathology</i>. <b>72</b>, 654-666.</p>

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		<p>Tsuji M, Sato M &amp; Fuji S-i (2024) <i>The first report of rot disease of onion occurred by Pseudomonas kitaguniensis, causing severe rot symptoms at lower temperatures. Journal of General Plant Pathology. 90, 217-222.</i></p> <p>Van Overbeek LS, Visser JHM, Koenraad H &amp; Van Kruistum G (2006). <i>Onderdrukking van Pseudomonas syringae pv porri in prei. Plant Research International. <a href="https://edepot.wur.nl/297485">https://edepot.wur.nl/297485</a></i></p>
16.	Follow-up measures	No official measures



**Figure 1** Spot of affected plants in field with young leek plants (picture by Naktuinbouw).



**Figure 2** Close up of spot of affected plants in field with young leek plants (picture by Naktuinbouw).