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NEW DISEASE REPORT

First report of *Pseudomonas syringae* infecting *Iris foetidissima* in the United Kingdom

S. Oxspring[1] | **S. Carroll**[1] | **A. Bryning**[1] | **A. Gaunt**[2] | **A. Aspin**[1]

[1]Fera Science Ltd., York, UK

[2]APHA PHSI, Itchen Abbas, Winchester, UK

Correspondence
S. Oxspring, Fera Science Ltd., York Biotech Campus, Sand Hutton, York, YO41 1LZ, UK. Email: samuel.oxspring@fera.co.uk

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In March 2024, a sample of *Iris foetidissima* was submitted by the Plant Health and Seeds Inspectorate of the United Kingdom to Fera Science Ltd. The plant displayed symptoms of slightly sunken leaf spots with chlorotic halos and slight dieback from the leaf tips (Fig. 1), with 75 plants, approximately 50% of the plants inspected, showing symptoms. The plants were inspected at a garden centre in West Sussex but had been cultivated at a nursery in Surrey and were well established in their pots at the time of inspection.

A section of leaf tissue close to the leaf spots was excised aseptically, macerated in 0.1% peptone solution and streaked onto King's medium B (KB) and 5% sucrose nutrient agar (SNA) (Lelliott & Stead., 1987), and incubated at 25°C. After four days' incubation a predominant culture was observed with white colonies that fluoresced blue-green under ultraviolet light on KB and had slightly domed colonies on SNA (Fig. 2), typical of *Pseudomonas syringae*. Colonies were sub-cultured for further identification; characterisation via the LOPAT scheme (Lelliott et al., 1966) identified the bacterium as being a group Ia pseudomonad, indicating that it was likely to be *Pseudomonas syringae*. Partial gene sequencing using primers targeting the *rpoD* gene (Parkinson et al., 2011) showed that the isolate is in *Pseudomonas syringae* phylogroup II (genomospecies I) (Genbank Accession No. PP932688) (Fig. 3). The isolate has been deposited into the National Collection of Plant Pathogenic Bacteria (https://www.fera.co.uk/ncppb) as NCPPB 4788.



FIGURE 1 *Iris foetidissima* displaying symptoms of sunken leaf spots with chlorotic halos.

Pathogenicity tests were performed using three *Iris foetidissima* plants. Plants were covered with bags for 24 hours, spray inoculated

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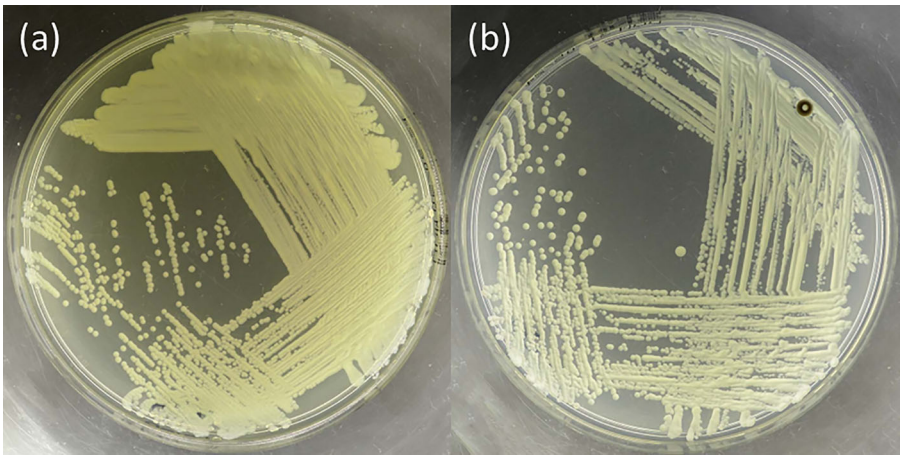

FIGURE 2 *Pseudomonas syringae* (isolate NCPPB 4788) on (a) King's medium B and (b) 5% sucrose nutrient agar, after two days' growth at 25°C.

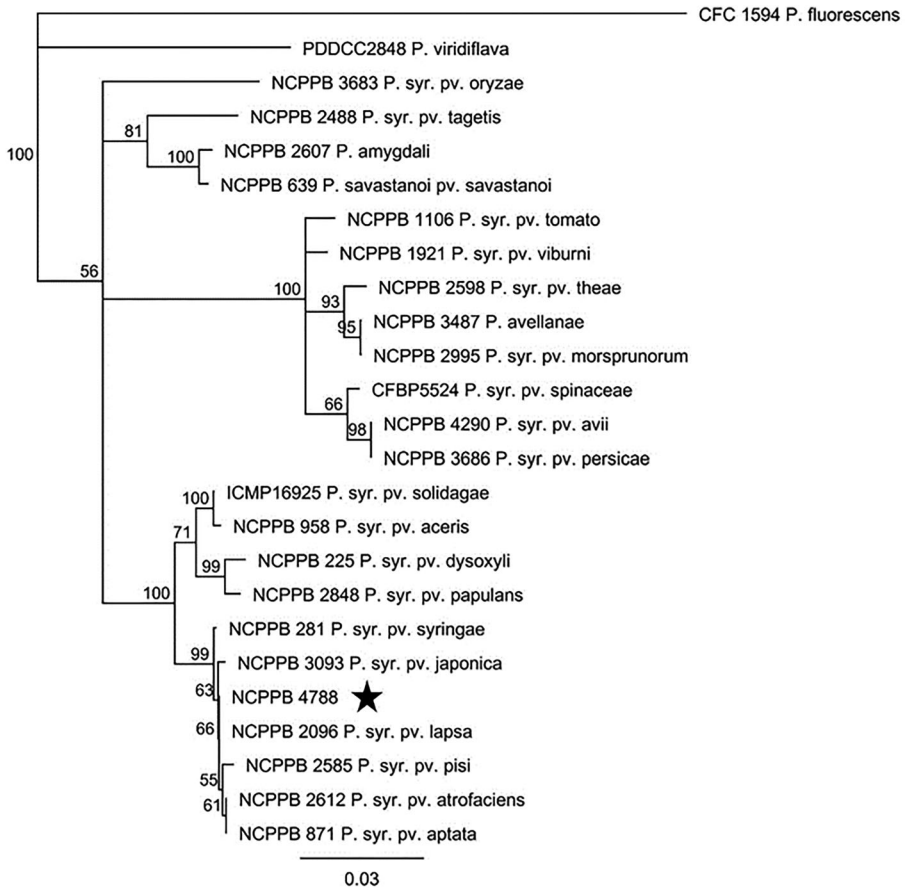

FIGURE 3 Phylogenetic neighbour joining tree (1000 bootstraps) based on the *rpoD* gene of the isolate from *Iris foetidissima* (indicated by a star) along with *Pseudomonas syringae* reference strains. For clarity, most pathovars of phylogroup II are displayed but only representatives of the other *P. syringae* phylogroups are shown, with *P. fluorescens* used as an outgroup. Sequences were trimmed to 577 bp.

until run off with a 10^8 cfu/ml bacterial suspension in phosphate-buffered saline (PBS) and re-covered for a further 24 hours to maintain high humidity. Mock inoculations were performed using the same method but sprayed with PBS only. Plants were kept in a glasshouse cubicle for the duration of the infection, maintained between 26–30°C with no artificial lighting (April-May). No symptoms were observed one month post inoculation. Plants were reinoculated using the same method as above with the addition of being stabbed with a ster-

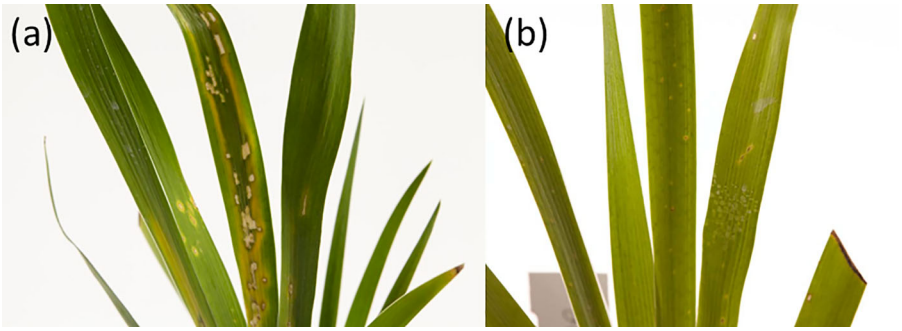

FIGURE 4 (a) *Iris foetidissima* 14 days post reinoculation with *Pseudomonas syringae* (isolate NCPPB 4788), showing sunken leaf spots with chlorotic halos; (b) *Iris foetidissima* 14 days post mock inoculation showing slight mechanical damage at the site of wounding.

ile hypodermic needle to aid infiltration. Mock inoculations were carried out by spraying with PBS and then stabbing with a sterile needle. Chlorotic spots started to develop seven days post reinoculation (Fig. 4a) while mock-inoculated plants showed mechanical damage at the wounding site but no further symptom development (Fig. 4b). Koch's postulates were fulfilled by re-isolation from the leaf spots, taken from leaves that had been surface sterilised by swabbing with 100% ethanol, and were confirmed as the same isolate by partial gene (*rpoD*) sequencing.

To our knowledge this is the first finding of *Pseudomonas syringae* infecting *Iris foetidissima* in the UK. There has been a previous report of *Pseudomonas syringae* infecting *Iris germanica* in the USA (Umesha et al., 2008). As symptoms were only observed after mechanical damage, we propose that the bacterium needs wounds to cause infection. *Puccinia iridis* was also found on the original sample, which might have provided entry points for the bacteria but there are currently no publications to support this hypothesis and further work would be required to prove it.

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ORCID

S. Oxspring https://orcid.org/0009-0005-8625-6369
S. Carroll https://orcid.org/0000-0002-2761-0744
A. Bryning https://orcid.org/0000-0001-7628-3615
A. Aspin https://orcid.org/0000-0001-8232-8867

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