



## First report of the rust *Puccinia komarovii* on *Impatiens parviflora* in the UK

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*Impatiens parviflora*, commonly known as small balsam, is an invasive plant native to the mountains of central Asia. Intentionally introduced through botanical curiosity, this plant has spread rapidly throughout Europe where it has naturalised and can form dense stands in forests and forest edges. On 4 September 2013, uredinia and telia of the rust fungus *Puccinia komarovii* were identified on the abaxial leaf surface of *I. parviflora* (Balsaminaceae) at Northchurch Common, Hertfordshire, UK (51.788326, -0.596067) (Fig. 1). *Impatiens parviflora* was found in an open beech woodland growing alongside *Geranium* sp., *Glechoma hederacea*, *Pteridium aquilinum*, *Rubus fruticosus* and *Urtica dioica*.

To confirm the identification of the rust, the ITS2-LSU region sequence was amplified with the Rust2inv (Aime, 2006) and LR6 (White *et al.*, 1990) primers and sequenced (GenBank Accession No. LC494104). A BLAST search revealed 99% identity to *P. komarovii* collected from *I. parviflora* (KC460259) and *I. glandulifera* (KC460250). Microscopic examination confirmed spore size to be on average 34 × 20.4 µm and 18.8 × 17.6 µm (length × width) for the teliospores and urediniospores respectively (Fig. 2), within the range reported in Tanner *et al.* (2015).

Distinct pathotypes of *P. komarovii* exist which are highly specific towards their hosts (Tanner *et al.*, 2015). These pathotypes are morphologically and molecularly indistinguishable and require cross inoculation studies to differentiate them. Using the methodology outlined in Tanner *et al.* (2015), urediniospores removed from infected leaves were mixed with talcum powder at a ratio of approximately 1 to 50 and brushed onto the lower leaf surface of two leaves of four *I. glandulifera* and *I. parviflora* plants. Plants were lightly misted with sterile distilled water before placing in a dew chamber set at 15°C, for 48 hours. Symptoms were first observed on *I. parviflora* eight days after inoculation with the development of chlorotic spots on the upper leaf surface and uredinial sporulation recorded a further eight days later. No symptoms were observed on *I. glandulifera* six weeks after inoculation.

Reports of *P. komarovii* on *I. parviflora* have been well documented; it was first recorded in Europe in Kiev, Ukraine in 1921 (Sydow, 1935). Since

then the rust has spread westward throughout continental Europe and is now present in at least 21 European countries. More recently it was recorded in Belgium in 2009; this is the first report of the pathogen in the UK. Due to the location of this finding and the presence of the rust in continental Europe, it is likely that the rust is present elsewhere in UK; in 2019 we observed the rust in Egham, Surrey (51.418154, -0.569643) (Fig. 3), confirming its identity through inoculation studies as outlined above.

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Figure 1

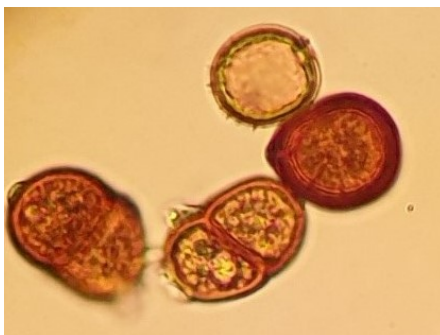


Figure 2



Figure 3

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