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A new species of *Aria* (Rosaceae) from the Wye Valley, Wales

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Abstract
Aria wyensis D.Green is a new endemic species of whitebeam from the Wye Valley, Wales. It is a member of the *Aria porrigentiformis* group with small (6–9 cm), broadly obtrullate to oblanceolate leaves with few (5–7) pairs of lateral veins, prominent, forward-facing, acuminate, biserrate lobes and small (5–6 cm across), few-flowered inflorescences. Flow cytometry indicates it is tetraploid. The population when first found consisted of 16 trees but this number has subsequently been reduced due to inappropriate action by climbers to 12 trees. Conservation action is required to prevent further loss.

Keywords: *Aria wyensis*; Critically Endangered; endemic; *Sorbus*; whitebeam.

Introduction

In 2012, whilst looking for whitebeams in the Wye Valley, Wales, I found a distinctive population of trees in a small quarry which differed from other whitebeams known in Britain and Ireland (Rich et al., 2010; Rich et al., 2014). The trees have been studied for ten years and are here described as a new species.

I follow the recent split of *Sorbus* sensu lato in Europe (Sennikov & Kurtto, 2017) and describe it as a member of *Aria* (Pers.) Host (=*Sorbus* subgen. *Aria* Pers.).

Aria wyensis D.Green **sp. nov.**
HOLOTYPE. Wynd Cliff Quarry, St Arvens, v.c.35 Monmouthshire, Wales, SO5307797377, 75 m altitude, 20 July 2022, D.E. Green (**NMW** accession no.V.2023.004.1, Fig. 1. Isotype: herb. **D.E. Green**).

Wynd Cliff whitebeam

Description

Shrub to at least 6 m tall. Bark of the larger trunks brown with lenticels. Leaf buds ovoid-conical, acute, pilose. Broad leaves of short sterile shoots (6–)7–9 × (4–)5–6(–6.5) cm, 1.3–1.5 times as long as wide, obtrullate to obovate in outline and widest at 50%–64% of the way along the leaf length, base cuneate, apex acute, with distinct lobes up to 3 mm deep with pronounced acuminate tips, the toothing biserrate reducing down to nil at the base, pairs of veins 5–7(–8) augmented by finer tertiary veins, held at an angle of 25–32º to the midrib, upper side of the

young leaf shiny, bright green when young, aging to a mat green at maturity, lower side greyish-green tomentose with some arachnoid hairs on veins. Petioles 10–20(–25) mm. Inflorescences 5–6 cm across, flat-topped with a slight crowning. Flowers 10–14 mm across. Sepals bright green, narrowly triangular with a blunt tip, sparsely glandular, arachnoid hairs on the margins. Petals 4.0–4.5 mm long, orbicular to round, creamy white. Anthers cream with slight pink/red tinge. Styles 2, free almost to base. Largest fruit 10–12 × 12–15 mm, wider than long but mostly globose or almost cuboid in some aspects, dark orange in colour maturing to red with small lenticels. Seed 6–7 × 1–2 mm, dark brown; shiny, with longitudinal striations on the top face which is convex with two longitudinal ridges. Chromosome number: flow cytometry of three samples indicates that this specimen is a tetraploid (pers. comm. Jaume Pellicer 2012).

Figure 1. Holotype of *Aria wyensis* (NMW)

Aria wyensis is a member of the *Aria* with simple leaves that are tomentose underneath and red fruits, and it has clear affinities to the *A. porrigentiformis* (E.F. Warb.) Sennikov & Kurtto *senso latu* group. Within *Aria*, *A. wyensis* is characterised by the small, broadly obtrullate to obovate leaves with few pairs of lateral veins, prominent, forward-facing, acuminate, biserrate lobes and small, few-flowered inflorescences (Figs. 2-4).

Figure 2. Typical leaves of *Aria wyensis* from short lateral shoots

Figure 3. *Aria wyensis* inflorescence in bud

Figure 4. *Aria wyensis* fruits

Aria wyensis is similar to some other species of *Aria* which grow in the lower Wye valley (Rich *et al*., 2009 updated by Rich *et al*., 2019). It is most similar to the triploid *Aria greenii* (T.C.G. Rich) Sennikov & Kurtto but lacks the prominent leaf apex of that species. The tetraploid *A. porrigentiformis* differs in its scarcely lobed but regularly toothed leaves and larger inflorescences, as does the triploid *A. evansii* (T.C.G. Rich) Sennikov & Kurtto. The triploid *A. saxicola* (T.C.G. Rich) Sennikov & Kurtto has narrowly obovate leaves. The tetraploids *S. eminens* (E.F. Warb.) Sennikov & Kurtto and *S. parviloba* (T.C.G. Rich) Sennikov & Kurtto both have larger, broadly elliptical leaves. The variable diploid *Aria edulis* (Willd.) M. Roem (=*Sorbus aria* (L.). Crantz) differs in having leaves typically ovate to elliptic with 9–14 pairs of veins and fruits longer than wide.

Aria wyensis also differs in that leaf-burst and flowering is consistently three weeks later than the other *Aria* species (I have noted this over 10 separate springs). The growth mode in this single locality is multi-stemmed and shrublike, which may be partly due to cutting back of stems by climbers.

All known trees show little variation in leaf, flower or fruit.

Distribution

Aria wyensis appears to be a Welsh endemic, limited to a single quarry and associated cliffs near the Wynd Cliff, Lower Wye Valley, v.c.35 Monmouthshire. It occurs as a pioneer species growing on spoil on two quarry benches in a recently disused, SE-facing carboniferous limestone quarry (Fig. 5). Other whitebeams and relatives occurring here are *Aria edulis, A. eminens, A. porrigentiformis* and *Sorbus aucuparia*.

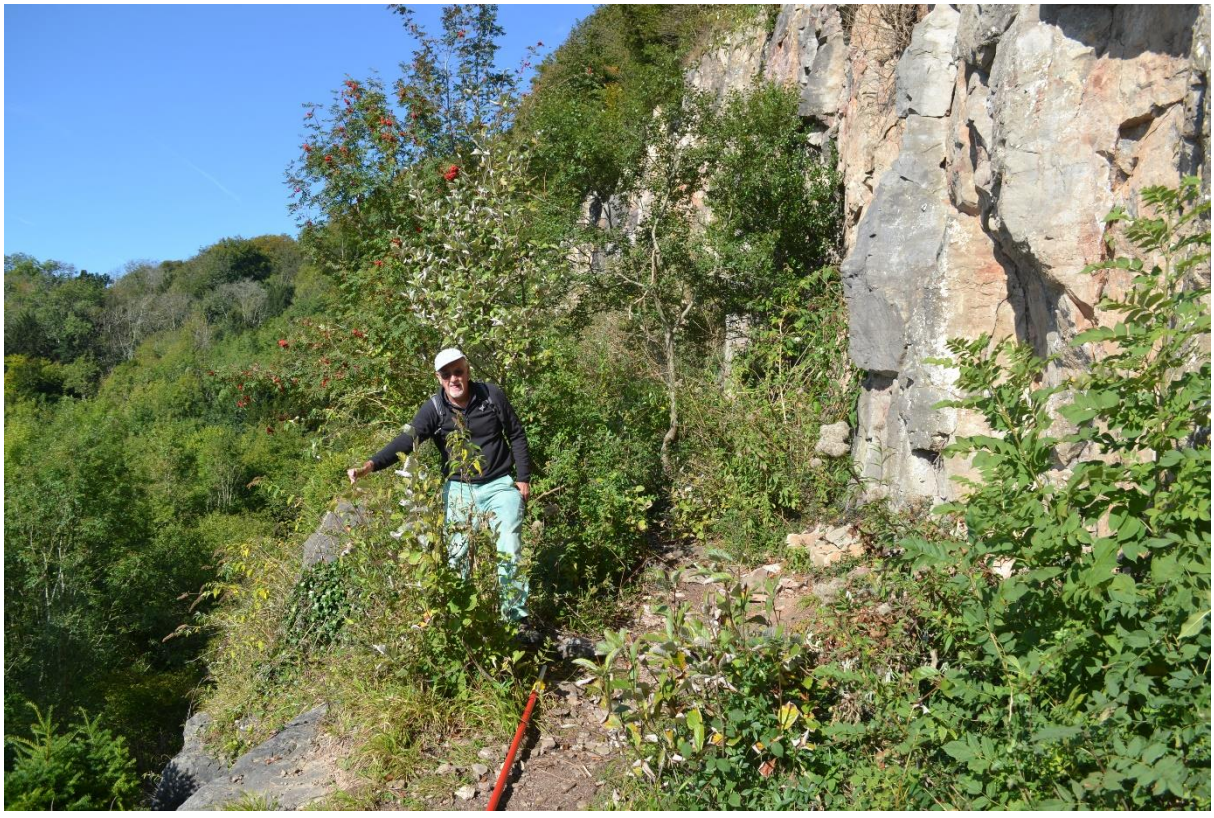

Figure 5. Dave Green with *Aria wyensis*, 2017. Image: T.C.G. Rich

Origins

Like other members of the *A. porrigentiformis* group, the tetraploid ploidy level suggests it is probably derived indirectly as a cross between the diploid *Aria edulis* and a member of the *A. porrigentiformis* group though exactly how is unclear due to the relatively uncommon characters of small, lobed leaves with few veins.

It must have arrived in the quarry as seed, possibly fallen from parent trees on the adjacent, near-vertical cliffs above the quarry.

Conservation status

With the small, declining population restricted to one locality it is IUCN (2022) Red List Category 'Critically Endangered' (Criteria A, B, C and D).

It was first found and collected by D.E. Green in 2012 when 16 individuals were recorded. In 2017, only 12 bushes were present, the population reduced by unofficial inappropriate management by climbers. The quarry is part of the Lower Wye Valley SSSI, and Natural Resources Wales are now aware of its occurrence. Twelve bushes were still present in 2022.

Etymology

This epithet is derived from the Wye Valley where *A. wyensis* occurs.

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