

Some new British and Irish *Sorbus* L. taxa (Rosaceae)

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ABSTRACT

Nine new *Sorbus* taxa are described from Britain and Ireland: *S. admonitor* M. C. F. Proctor, sp. nov., *S. cambrensis* M. C. F. Proctor, sp. nov., *S. cuneifolia* T. C. G. Rich, sp. nov., *S. eminentiformis* T. C. G. Rich, sp. nov., *S. margaretae* M. C. F. Proctor, sp. nov., *S. × motleyi* T. C. G. Rich, hybr. nov., *S. scannelliana* T. C. G. Rich, sp. nov., *S. stenophylla* M. C. F. Proctor, sp. nov. and *S. stirtoniana* T. C. G. Rich, sp. nov.

KEYWORDS: agamospecies, Britain, Ireland, isozymes, whitebeam.

INTRODUCTION

Some new *Sorbus* L. (Rosaceae) names are required for taxa to be included in an identification handbook (T. C. G. Rich *et al.*, in preparation). Some taxa, such as the form of *S. anglica* Hedl. from Llangollen with narrower cuneate bases to the leaves or the more deeply lobed form of *S. devoniensis* E. F. Warb., have been known for many years, whilst other taxa have only recently been discovered. The new taxa are described below.

METHODS

Broad leaves from the short, vegetative shoots in sunlit situations, excluding the oldest and youngest leaf (Aas *et al.* 1994), were measured on herbarium material in NMW. Lobing was measured perpendicular to the main vein at the centre of the leaf. The numbers of individual veins or pinnae are described rather than number of pairs as the veins or pinnae are usually alternate or subopposite rather than being strictly opposite. Fruits were measured

on fresh material, and the colours matched against the Royal Horticultural Society colour charts (Royal Horticultural Society 1966).

Conservation status assessments were made for the new species following the I.U.C.N. (2001) guidelines. These are largely based on known population sizes or estimates as there are no data on population trends.

NEWS SPECIES DESCRIPTIONS

***Sorbus admonitor* M. C. F. Proctor, sp. nov.**

HOLOTYPUS: large tree above scree, Watersmeet, v.c. 4 North Devon, England, SS744490, 10 October 2007, T. Rich & D. Cann (NMW, accession no. V.2007.1.225; ISOTYPI: **BM, CGE**).

Diagnosis: *S. devoniensis* E. F. Warb. similis sed foliis in centro laminae 10–23(–25) partibus centesimis ad costam profundius lobatis (non, ut in *S. devoniensis*, 6–18(–23) partibus centesimis) differt.

Similar to *S. devoniensis* E. F. Warb. but differing in having leaves more deeply lobed 10–23(–25)% of the way to the midrib at the centre of the lamina (not 6–18(–23)% as in *S. devoniensis*).

Sorbus admonitor is a member of the *S. latifolia* group, and is characterised by the ovate to obovate, shallowly but acutely lobed leaves 1.2–1.5 times as long as wide and cut 10–23% of way to the midrib with broadly rounded to broadly cuneate bases and greenish-white undersides, and by the large brownish berries. Compared to *S. devoniensis* the leaves are also glossier. Figure 1 shows typical leaves of *S. admonitor* and *S. devoniensis*.

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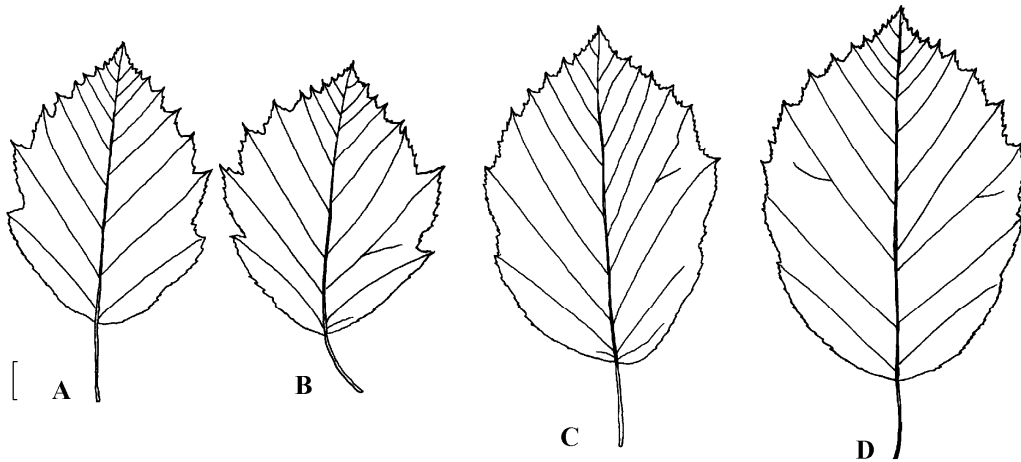


FIGURE 1. Typical leaves of *S. admonitor* (A, B) and *S. devoniensis* (C, D). Scale bar 1 cm.

Sorbus admonitor has been known for many years as the large tree at Watersmeet car park, Devon with a 'No Parking' notice nailed to it, which had leaves more deeply lobed than the widespread form of *S. devoniensis* (Martin & Fraser 1939; Sell 1989). Studies of isozymes by Proctor *et al.* (1989) showed that *S. admonitor* differs consistently from *S. devoniensis*. The specific epithet '*admonitor*' (i.e. to admonish) was first coined by E. F. Warburg as a jocular reference to the 'No Parking' notice.

Sorbus admonitor is endemic to the Watersmeet area where there are at least 108 trees in the East Lyn Valley and two trees nearby above Sillery Sands, Lynmouth (Rich & Cann 2009). *Sorbus devoniensis sensu stricto* does not grow in the East Lyn Valley area and the two taxa have not been confirmed growing together. *Sorbus admonitor* differs from *S. subcuneata* Wilm., with which it does grow, in having broader leaves with rounded bases, and a denser crown.

The I.U.C.N. (2001) conservation assessment is 'Endangered' based on the Rich & Cann (2009) survey data.

***Sorbus cambrensis* M. C. F. Proctor, sp. nov.**

HOLOTYPE: face of railway cutting cliff, Cwm Clydach, SO218120, 9 July 2001, T. C. G. Rich, R. Preece & G. Motley (NMW, accession no. V.2001.25.74a).

DESCRIPTION

Frutex vel arbor parva ad 8 m. Cortex truncorum majorum griseibrunneus. Gemmae lanceoloideae, acutae, pilis albis vestitae. Folia

lata brachyblastorum 6.0–11.0(–12.5) × (4.0–) 4.5–8.0(–8.5) cm, obovata, 1.3–1.6plo longiora quam latiora, ad longitudinis suae 53–67 partes centesimas latissima, apice obtuso, basi cuneata (angulo inter marginem et costam 34–54(–58)°, sine lobis vel lobis non profundis secta, marginibus biserratis, dentes plerumque exstantes ferentibus sed in 1–3 cm infimis prope petiolum fere integris, venis 18–24, in centro laminae ad angulum (28–)31–41(–48)° a costa tentis; pagina superior atro-viridis; pagina inferior griseialba tomentosa. Inflorescentiae ad 8 cm diametro, aggregatae, tholiformes, ramulis sparsim tomentosis instructae. Sepala triangularia vel deltata, viridia vel tomentosa. Petala 7–8.5 × 5–6 mm, elliptica, alba. Antherae cremaeae vel cremaeae roseitinctae. Styli 2, plus minusve per dimidium longitudinis conjuncti, ad basin pilosi. Fructus maximi 10.5–12.5 × 11.5–13 mm, 0.8–1.0plo longiores quam latiores, saepe aspectu globoso, in maturitate saturate coccinei, lenticellarum mediocrium numero modico praediti.

Shrub or small tree to 8 m or more tall. Bark of larger trunks greyish-brown. Buds lanceoloid, acute, clothed with white hairs. Broad leaves of short sterile shoots 6.0–11.0(–12.5) × (4.0–) 4.5–8.0(–8.5) cm, obovate, 1.3–1.6 times as long as wide and widest 53–67% of the way along the leaf length, with the apex obtuse and the base cuneate (with the angle between the margin and the midrib 34–54(–58)°), unlobed or shallowly lobed, with the margins biserrate with teeth usually directed outwards but nearly entire in the lowest 1–3 cm near the petiole,

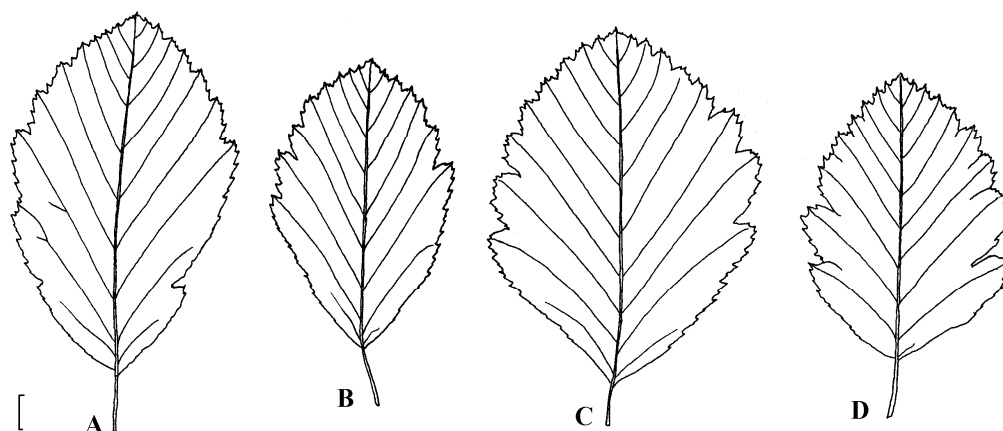


FIGURE 2. Typical leaves of *S. cuneifolia* (A, B) and *S. anglica* (C, D). Scale bar 1 cm.

with 18–24 veins, held at an angle of (28–)31–41(–48)° to the midrib at the centre of the lamina; upper surface dark green; lower surface greyish-white tomentose. Inflorescences to 8 cm in diameter, crowded, domed, with branchlets sparsely tomentose. Sepals triangular to deltate, green or tomentose. Petals 7–8.5 × 5–6 mm, elliptic, white. Anthers cream or cream with a hint of pink. Styles 2, joined for about half their length, pilose at the base. Largest fruits 10.5–12.5 × 11.5–13 mm, 0.8–1.0 times as long as wide, often looking globose, deep red at maturity (R.H.S. colour chart 33A, 42A, 44A, 45A, 46A), with a moderate number of medium lenticels.

Sorbus cambrensis is a member of the *S. porrigentiformis* E. F. Warb. group within the *S. aria* (L.) Crantz group, and is characterised by the obovate, biserrate leaves which are greyish-white underneath and the large subglobose fruits.

Studies of *S. porrigentiformis* by Proctor & Groenhof (1992) demonstrated that trees from Coed Pantydarren (cited as Darren Disgwylfa), Craig-y-Cilau and other crags in the Llangatock area had a different isozyme profile to the widespread lowland form of *S. porrigentiformis*, and also differed in leaf tothing and fruit size and shape. They also noted that plants at Tarren yr Esgob differed slightly from *S. cambrensis*, and these are described separately below as *S. stenophylla*.

Sorbus cambrensis is endemic to v.c. 42 Breconshire, Wales. It has been recorded scattered widely within Cwm Clydach, at Blackrock, at Craig-y-Cilau, and at Coed Pantydarren. The total population is probably about 100 plants.

Sorbus cambrensis is very similar to *S. porrigentiformis* and *S. stenophylla*. It tends to grow into a larger tree than *S. porrigentiformis* with usually more robust shoots, has leaves somewhat more oblong in outline and biserrate, and has larger, subglobose fruits (length:width ratio 0.85–0.95) which are brighter red. *Sorbus stenophylla* has narrower leaves with a narrower cuneate base and deeper biserrate tothing. Morphologically the leaves are similar to those of *S. leptophylla* E. F. Warb. but that species has fruits longer than wide. For leaf silhouettes of *S. cambrensis*, see Figures 5j–l of Proctor & Groenhof (1992).

The provisional I.U.C.N. (2001) conservation assessment is 'Endangered'.

***Sorbus cuneifolia* T. C. G. Rich, sp. nov.**

HOLOTYPE: Creigiau Eglwyseg (Cefn Fedw), Llangollen, v.c. 50 Denbighshire, Wales, 10 July 2002, T. C. G. Rich & S. O. Hand (NMW, accession no. V.2002.17.161).

Diagnosis: *S. anglicae* Hedl. similis sed foliis basi angustius cuneatis, angulo inter marginem et costam (29–)32–44(–46)° (non, ut in *S. anglica*, foliis basi late cuneatis, angulo inter marginem et costam (38–)40–59(–65)°) differt.

Similar to *S. anglica* Hedl. but differing in having leaves more narrowly cuneate at the base with the angle between the margin and the midrib (29–)32–44(–46)° (not broadly cuneate with the angle between the margin and the midrib (38–)40–59(–65)° as in *S. anglica*).

Sorbus cuneifolia is a member of the *S. anglica*/*S. intermedia* group, and is characterised by the elliptic to obovate leaves with distinct obtuse lobes cut up to about a quarter

to one third of the way to the midrib; they are greyish-white tomentose beneath with 'feathery' intermediate veins between the main veins, and have cuneate leaf bases.

Sorbus cuneifolia was first recognised as distinct by A. J. Wilmott and E. F. Warburg who used a working epithet '*castelli*' after its occurrence on the ruined walls of Castell Dinas but they never published it. The epithet *cuneifolia* refers to the narrower leaf bases, its distinguishing feature from the closely related *S. anglica*. Figure 2 shows typical leaves of *S. cuneifolia* and *S. anglica*.

Sorbus cuneifolia is a rare tree confined to the west-facing Carboniferous Limestone crags of Eglwyseg Mountain north of Llangollen, Denbighshire (v.c. 50), Wales. About 240 plants are known (Morgan 1987, Woods 1998), and its I.U.C.N. (2001) conservation assessment is thus 'Endangered'.

***Sorbus eminentiformis* T. C. G. Rich, sp. nov.**

HOLOTYPE: coppiced tree in woodland, Seven Sisters, Great Doward, v.c. 36 Herefordshire, England, SO546153, 23 September 2002, T. C. G. Rich (NMW, accession no. V.2002.17.150).

Diagnosis: *S. eminenti* E. F. Warb. similis sed foliis subrhombis ad basin late cuneatis (non, ut in *S. eminente*, orbicularibus ad basin rotundatis) differt.

Similar to *S. eminens* E. F. Warb. but differing in having subrhombic leaves broadly cuneate at the base (not orbicular and rounded at the base as in *S. eminens*).

Sorbus eminentiformis is a member of the *S. aria* group and is characterised by the obovate-orbicular to subrhombic leaves 1.0–1.3 times as long as wide with a broadly cuneate base (the lowest part of the leaf looking triangular) and regular, neat, uniserrate, acuminate teeth, and the broad, red fruits.

When Warburg (1957) described *S. eminens* from Offa's Dyke, Tidenham in the Wye Valley, he noted that plants from around Symonds Yat differed from the form he described from the Wye Valley and Avon Gorge in having subrhombic leaves with rather deeper teeth. Molecular studies by Proctor & Groenhof (1992), Chester *et al.* (2007) and Cowan *et al.* (2008) have confirmed that they differ from each other. For leaf silhouettes of *S. eminentiformis* see Figures 4a–b of Proctor & Groenhof (1992), and Figures 4c–f for *S. eminens*.

Sorbus eminentiformis is endemic to the Lower Wye Valley in England and Wales, where it occurs in v.c. 34 West Gloucestershire, v.c. 35 Monmouthshire and v.c. 36 Herefordshire (Rich *et al.* 2009). The total population is probably under 100 trees, the bulk of which occur on the Great Doward. The I.U.C.N. (2001) conservation assessment is 'Endangered'.

***Sorbus margaretae* M. C. F. Proctor, sp. nov.**

HOLOTYPE: Desolate, v.c. 4 North Devon, SS7849, 31 May 1997, M. C. F. Proctor (NMW, accession no. V.2003.19.388).

Diagnosis: *S. vexanti* E. F. Warb. similis sed fructibus latis atrorubrioribus latioribus quam longioribus differt.

Similar to *S. vexans* E. F. Warb. but differing in having broad, darker red fruits that are wider than long.

Sorbus margaretae is a member of the *S. aria* group, and is characterised by the unlobed, obovate leaves with biserrate teeth which are densely white-tomentose underneath and the red, very broad fruits.

Sorbus margaretae was first recognised as distinct by Margaret E. Bradshaw during her surveys of the rare whitebeams of South-west England in 1984, and it is named after her. It was provisionally named 'Taxon D', and isoenzyme studies showed that it is genetically distinct from the related species *S. rupicola* (Syme) Hedl. and *S. vexans* (Proctor *et al.* 1989). It is probably the plant referred to as '*S. rupicola* "Devon form"' by Martin & Fraser (1939).

Sorbus margaretae is endemic to the coast of South-west England from Combe Martin, North Devon (v.c. 4) to Culbone, South Somerset (v.c. 5). The total population is at least 120 plants. The I.U.C.N. (2001) conservation assessment is 'Endangered' based on the available data.

Sorbus margaretae is distinguished from *S. vexans* by the darker red fruits which are much broader than long, and by minor leaf characters (Proctor *et al.* 1989). It is distinguished from *S. rupicola* – which has elliptic-obovate leaves with single tootthing – by the broader obovate leaves with biserrate tootthing. *Sorbus porrigentiformis* also grows in some of the same localities and is similar but has broader leaves. Figure 3 shows typical leaves and fruits of *S. margaretae*, *S. rupicola* and *S. vexans*.

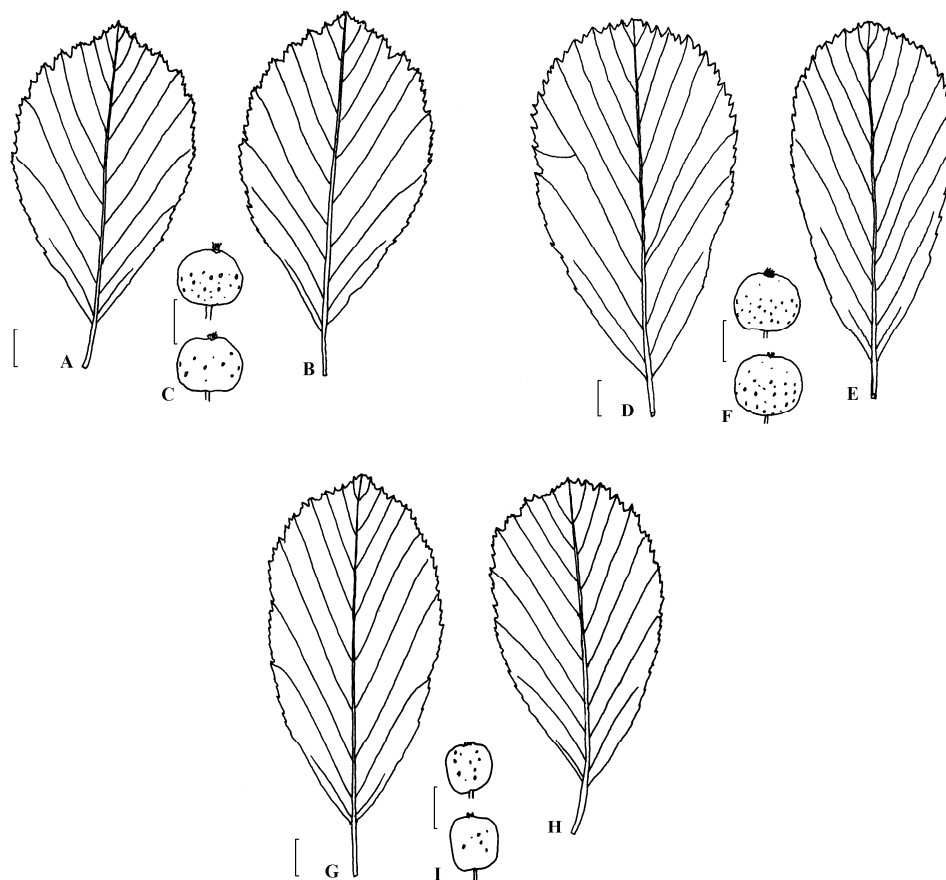


FIGURE 3. Typical leaves and fruits of *S. margaretae* (A–C), *S. rupicola* (D–F) and *S. vexans* (G–I). Scale bars 1 cm.

Sorbus × *motleyi* T. C. G. Rich, **hybr. nov.**
= *Sorbus aucuparia* L. × *S. leyana* Wilm.

HOLOTYPUS: Coed Penmailard, Brecon (v.c. 42), Wales, T. C. G. Rich, 11 June 2002 (NMW, accession no. V.2002.17.074).

DESCRIPTION

Arbor juvenis caulibus erectis. Petioli 10–14 mm. Folia lata brachyblastorum 65–86 × 50–60 mm, 1.25–1.65plo longiora quam latiora, elliptica, ad longitudinis suae 40–55 partes centenas latissima, venis 13–17, in centro laminae ad angulum 37–55° a costa tentis, profunde lobata, ad basin pinnis lateralibus 4–7 discretis ellipticis acutis et foliolo terminali multo ampliore late ovato obtuso lobato praedita, marginibus magis minusve uniserratis, dentes acutos prorsum projectos ferentibus, supra glabrescentia, infra

viridialba tomentosa, aestate exeunte glabrescentia. Inflorescentiae ad 8 cm diametro, aggregatae, tholiformes, ramulis sparsim tomentosis instructae. Flores 12–18 mm diametro. Sepala triangularia, tomentosa, glandulis paucis in marginibus praedita. Petala 7–9 × 5–6 mm, elliptica, alba. Antherae cremae roseinctae. Styli 2, plus minusve per unum longitudinis trientem conjuncti, ad basin pilosi. Fructus maximi 9–12 × 10–13 mm, (0.75–)0.8–1.0plo longiores quam latiores, aspectu plerumque latiores quam longiores, in maturitate coccinei, lenticellis paucis parvis praediti.

Young tree with erect stems. Petioles 10–14 mm. Broad leaves of short shoots 65–86 × 50–60 mm, 1.25–1.65 times as long as wide, elliptic, widest 40–55% of the way along the leaf length, with 13–17 veins, held at an angle

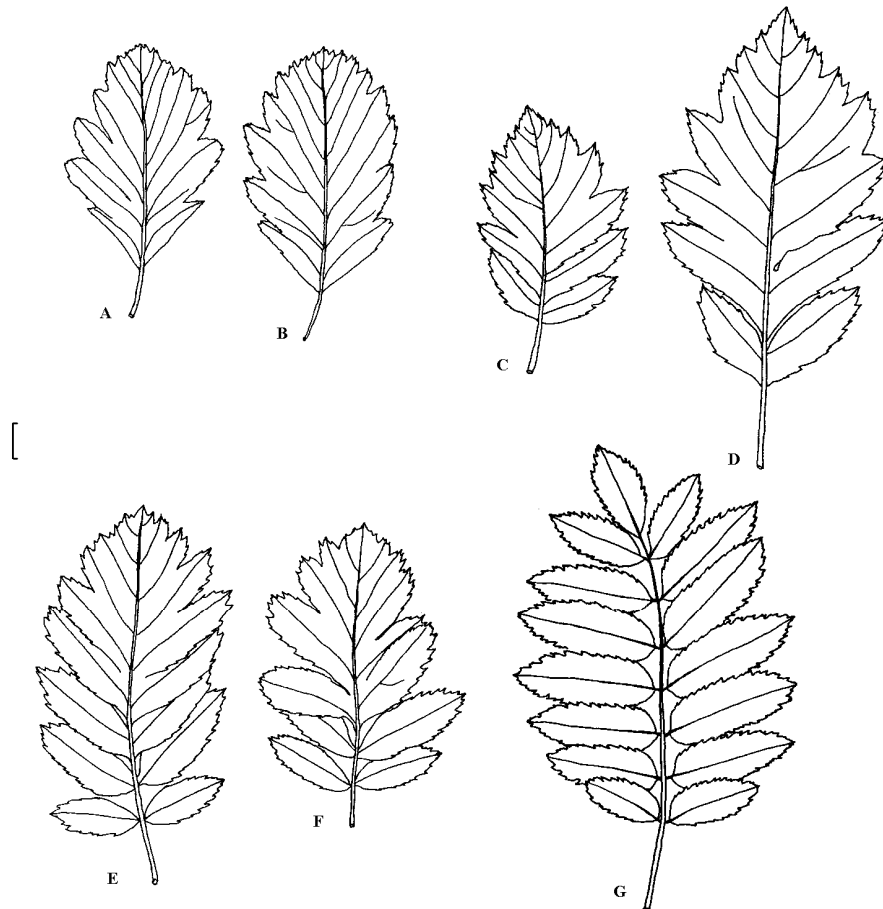


FIGURE 4. Leaves from *Sorbus* species at Coed Penmailard. A, B, Broad leaves of short shoots of *S. leyana*. C, D sucker leaves of *S. leyana*. E, F Broad leaves of short shoots of *S. × motleyi*. G, *S. aucuparia*. Scale bar = 1cm.

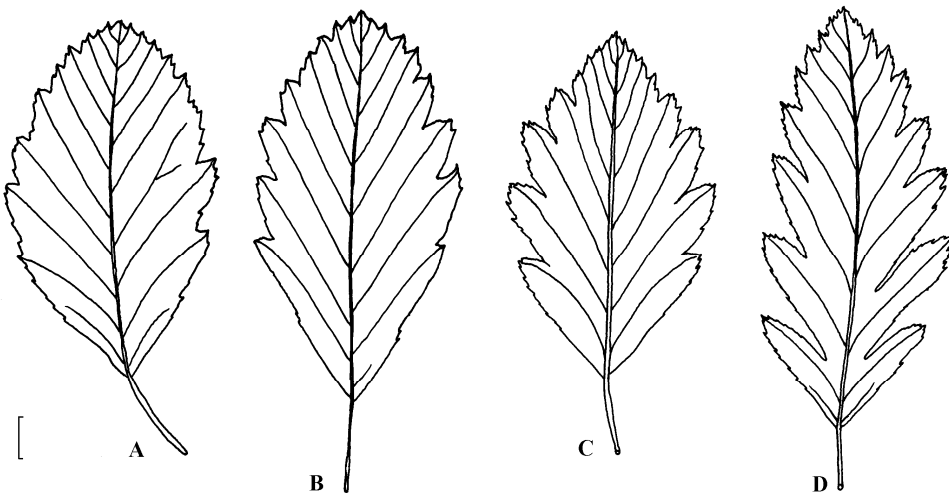


FIGURE 5. Typical leaves of *S. scannelliana* (A, B), and *S. arranensis* (C, D). Scale bar 1 cm.

of 37–55° to the midrib at the centre of the lamina, deeply lobed with 4–7 free, elliptic, acute, lateral pinnae at the base and a much larger broadly ovate, obtuse, lobed terminal leaflet, with the margins ± uniserrate with acute, forward-pointing teeth, glabrescent above, greenish-white tomentose beneath, becoming glabrescent in late summer. Inflorescences to 8 cm in diameter, crowded, domed, with branchlets sparsely tomentose. Flowers 12–18 mm in diameter. Sepals triangular, tomentose, with a few glands on the margins. Petals 7–9 × 5–6 mm, elliptic, white. Anthers cream with a hint of pink. Styles 2, joined for about a third of their length, pilose at the base. Largest fruits 9–12 × 10–13 mm, (0.75–)0.8–1.0 times as long as wide and usually looking wider than long, widest at of below the middle, scarlet at maturity (R.H.S. colour chart 45B) with a few small lenticels.

Sorbus × motleyi is a member of the *S. anglica/S.intermedia* group, and is characterised by the leaves with 4–7 free leaflets and a larger terminal lobe, and greenish white underneath. The wild saplings are too young to fruit, and the description of flowers and fruits here is based on grafted material which flowered at the National Botanic Garden of Wales in 2008.

Sorbus × motleyi (Figure 4E–F) differs from *S. leyana* (Figure 4A, B) in having leaves with four or more free lateral pinnae, the lowest of which are typically constricted at their base where they join the petiole. *Sorbus leyana* leaves from sunlit situations are generally deeply lobed but lack free pinnae (Figure 4A, B), but in deep shade or on sucker regrowth from damaged stems, they may have 1–3 free pinnae at the base of the leaf, usually with the lamina adnate to the midrib on both sides (Figure 4C, D). *Sorbus × motleyi* differs from *S. aucuparia* (Figure 4G) in having a broad, lobed, terminal leaflet much larger than the lateral leaflets.

Sorbus × motleyi is more likely to be confused with two other hybrids than either of its parents. It differs from *S. × thuringiaca* (Ilse) Fritsch (= *S. aucuparia* × *S. aria*) in having broader leaves with fewer veins and obtuse apices (leaves 1.5–2.0 times as long as wide with 16–27 veins and acute apices in *S. × thuringiaca*). *Sorbus × motleyi* differs from *S. × liljeforsii* T. Rich (= *S. aucuparia* × *S. intermedia*) in having broader leaves with greenish-white-tomentose undersides to the leaf (1.4–2.0 times as long as wide and

greenish-tomentose underneath in *S. × liljeforsii*; Rich 2008).

In 1999, G. S. Motley, after whom it is named, found a sapling with leaves intermediate between *S. leyana* and *S. aucuparia* under a *S. aucuparia* tree at Coed Penmailard, which he interpreted as a hybrid between them. A second, younger sapling was found nearby in 2004. AFLP data confirmed the hybrid origin of the first sapling (unpublished data; R. S. Cowan, pers. comm. 2002).

Sorbus × motleyi is analogous in origin to *S. pseudofennica* E. F. Warb., which arose as a *S. arranensis* Hedl. × *S. aucuparia* hybrid on Arran (Robertson *et al.* 2004a, b). The two *S. × motleyi* saplings appear to be different ages, and must have arisen independently; Robertson *et al.* (2004a, b) found that *S. pseudofennica* had also arisen on more than one occasion. The older of the two *S. × motleyi* saplings probably originated in c. 1990 after the damage inflicted to the woodland by the second Great Storm of 1989 (cf. Rich *et al.* 2005). The chromosome number is not known.

Sorbus × motleyi is endemic to Wales, and has only been found at Coed Penmailard, v.c. 42 Brecon. Currently only two saplings are known which could easily be accidentally trampled if care is not taken when visiting the site. It is I.U.C.N. (2001) threat category 'Critically Endangered'.

***Sorbus scannelliana* T. C. G. Rich, sp. nov.**

HOLOTYPE: wooded limestone ridge east of Blue Pool, Ross Island, Killarney, V9469588161, v.c. H2 North Kerry, Ireland, 9 September 2008, R. Hodd, A. McVeigh & T. Rich (NMW, accession number V.2008.1.3; ISOTYPI: **BEL, BM, DBN, TCD**).

Diagnosis: *S. arranensis* Hedl. similis sed foliis obtusis, in centro laminae 14–24 partibus centesimis ad costam non tantopere profunde lobatis (non, ut in *S. arranensis*, acutis, in centro laminae 30–60 partibus centesimis ad costam lobatis) differt.

Similar to *S. arranensis* Hedl. but differing in having obtuse leaves not so deeply lobed 14–24% of the way to the midrib at the centre of the lamina (not acute and lobed 30–60% of the way to the midrib at the centre of the lamina as in *S. arranensis*).

Sorbus scannelliana is a member of the *S. anglica/S. intermedia* group, and is characterised by the shallowly lobed, elliptic leaves which are greenish-white tomentose

underneath. It has probably evolved as a hybrid between *S. aucuparia* and *S. rupicola* (analogous in origin to *S. arranensis*) in the Killarney area where both parents occur. The epithet honours Maura J. P. Scannell, whose knowledge of Irish botany is unrivalled.

Sorbus scannelliana is endemic to Ross Island, Killarney, Kerry (v.c. H2), Ireland, and was first found in June 1988 by T. Rich and N. Taylor. The population size in September 2008 was found to be only five plants, and the I.U.C.N. (2001) conservation assessment is 'Critically Endangered'.

In the Killarney area, *S. scannelliana* is only likely to be confused with *S. anglica* which is locally frequent on Ross Island and the Muckross Peninsula, and *S. intermedia*. *Sorbus anglica* has broader leaves which are whiter underneath with distinct cross venation between the main leaf veins (Figure 2c, d). *Sorbus intermedia* is also naturalised on Ross Island and differs in having more deeply lobed leaves with fewer veins. *Sorbus scannelliana* differs from *S. leyana* Wilm. in having shallower leaf lobes, and from *S. minima* (Ley) Hedl. in having larger, broader leaves. Figure 5 shows typical leaves of *S. scannelliana* and *S. arranensis*.

***Sorbus stenophylla* M. C. F. Proctor, sp. nov.**

HOLOTYPE: Tarren yr Esgob, v.c. 42 Breconshire, Wales, SO252305, 6 September 1970, M. Porter (NMW).

DESCRIPTION

Frutex vel arbor parva ad 8 m. Gemmae lanceoloideae, acutae, pilis albis vestitae. Folia lata brachyblastorum (5.5–)7.0–11.5(–12.5) × 4.5–7.0(–7.5) cm, obrullata vel oblonga, 1.35–1.75plo longiora quam latiora, ad longitudinis suae 52–67 partes centesimas latissima, apice obtuso vel rotundato interdum acuminato vel acuto, basi cuneata (angulo inter marginem et costam 30–42°), plerumque sine lobis sed interdum lobis non profundis secta, marginibus dentes acutos biserratos, prope apicem plerumque curviserratos, ferentibus sed in 1–3 cm infimis prope petiolum fere integris, venis (13–)14–20(–21), in centro laminae ad angulum (25–)27–33(–37)° a costa tentis; pagina superior atroviridis; pagina inferior griseialba tomentosa. Inflorescentiae ad 6 cm diametro, tholiformes, aggregatae, ramulis tomentosis instructae. Sepala triangularia, aut sparsim tomentosa aut viridia et solum in marginibus tomentosa. Petala 6–9 × 6–7 mm,

late elliptica vel late ovata, alba. Antherae roseae. Styli 2, plus minusve per dimidium longitudinis conjuncti. Fructus maximi 11.5–13.5 × 12–14 mm, 0.85–1.0plo longiores quam latiores, aspectu plerumque latiores quam longiores, in maturitate rubri, lenticellarum parvarum vel magnarum numero modico praediti.

Shrub or small tree to 8 m tall. Buds lanceoloid, acute, clothed with white hairs. Broad leaves of short sterile shoots (5.5–)7.0–11.5(–12.5) × 4.5–7.0(–7.5) cm, obrullate to oblong, 1.35–1.75 times as long as wide and widest 52–67% of the way along the leaf length, with the apex obtuse to rounded, occasionally acuminate or acute, and the base cuneate (with the angle between the margin and the midrib 30–42°), usually unlobed or occasionally with shallow lobes, with the margins biserrate, with acute teeth usually curving towards the apex near the top, but with the lowest 1–3 cm near the petiole nearly entire, with (13–)14–20(–21) veins, held at an angle of (25–)27–33(–37)° to the midrib at the centre of the lamina; upper surface dark green; lower surface greyish-white tomentose. Inflorescences to 6 cm in diameter, domed, crowded, with branchlets tomentose. Sepals triangular, either sparsely tomentose or green and tomentose only on the margins. Petals 6–9 × 6–7 mm, broadly elliptic to broadly ovate, white. Anthers pink. Styles 2, joined for about half their length. Largest fruits 11.5–13.5 × 12–14 mm, 0.85–1.0 times as long as wide and usually looking wider than long, red at maturity (R.H.S. colour chart 42A, 44A, 45A), with a moderate number of small to large lenticels.

Sorbus stenophylla is a member of the *S. porrigentiformis* group within the *S. aria* group, and is characterised by the narrowly cuneate, obrullate to oblong leaves with deeply incised teeth, and fruits which are wider than long.

Specimens named by E. F. Warburg show that he included material from the Llanthony Valley in his *S. porrigentiformis*. Studies of the isozymes by Proctor & Groenhof (1992) demonstrated that the isozyme profiles differed from *S. porrigentiformis* and were similar to *S. cambrensis*, differing from the latter in clearer separation of two bands. As the leaf shape is consistently different, they are treated as a distinct species. For leaf silhouettes showing *S. stenophylla* see Figures 5m–o of Proctor & Groenhof (1992). For differences from *S. cambrensis*, see above.

Sorbus stenophylla is endemic to the Llanthony Valley, Wales at Darren, Cwmyoy (v.c. 35), Tarren yr Esgob (in both v.c. 35 and v.c. 42) and Darren Lwyd (v.c. 42). Some plants at Craig-y-Cilau (v.c. 42) and Pwll-du Quarry, Govilon (v.c. 35) match *S. stenophylla* in morphology but require verification from DNA analysis. The population size at Tarren yr Esgob is c. 50 plants, there are seven trees at Darren Lwyd, and 50–100 at Cwmyoy. The I.U.C.N. (2001) conservation assessment is 'Endangered'.

Sorbus stirtoniana T. Rich, **sp. nov.**

HOLOTYPE: Tree c. 5 m tall with many trunks above track just west of junction, West Crag, Craig Breidden, v.c. 47 Montgomeryshire, Wales, grid reference SJ288139, T. C. G. Rich, A. Law, L. Houston, C. Charles and A. C. Tillotson, 19 June 2001 (NMW, accession no. V.2001.025.184), with photographs of fruits and measurements 2 October 2002.

Diagnosis: A *S. leptophylla* E. F. Warb. foliis ovatis vel ellipticis (non obovatis), ad vel infra (non supra) medium latissimis, differt.

Differs from *S. leptophylla* E. F. Warb. in having ovate or elliptic (not obovate) leaves, widest at or below (not above) the middle

Full description: Tree or small shrub to 5 m, with trunk ascending or appressed to the rock surface. Broad leaves of short shoots (50–)60–110(–135) mm long \times (32–)40–75(–77) mm wide, 1.3–1.8 times as long as wide, ovate to elliptic, widest at (37–)38–55(–56)% along the leaf length, cuneate at the base, acute at the apex, with margins simple or weakly lobed, serrate to biserrate, with a total of (16–)18–24 veins, the veins at the middle of the leaf held at an angle of (28–)29–47(–48) $^{\circ}$ to the midrib, glabrescent above, white-tomentose below. Fruits 11–15(–16) mm long \times (10–)11–13 mm wide, 0.9–1.3 times as long as wide and usually

appearing longer than wide, dark red (RHS 1966 colour chart 46b), with few medium-sized lenticels scattered mainly at the base.

Sorbus stirtoniana is a member of the *S. aria* group, and is characterised by the elliptic to ovate, acute, cuneate leaves with 18–24 veins which are white-tomentose below, and the large fruits which are usually longer than wide. Leaf outlines are given in Figures 2a–e of Rich *et al.* (2005). It is tetraploid (Bailey *et al.* 2008).

Sorbus stirtoniana differs from *S. leptophylla* E. F. Warb., to which it is most closely related, in having leaves wider below rather than above the middle (cf. Figure 1 of Rich *et al.* 2005). It shares the same *Aria* chloroplast type 'D' with *S. leptophylla* (Chester *et al.* 2007), which is also found in *S. aria* (L.) Crantz (frequent) and in *S. porrigentiformis* (rare). *Sorbus stirtoniana* differs from *S. porrigentiformis* and *S. rupicola* in having fruits longer than wide, and in having leaves widest below the middle. *Sorbus stirtoniana* differs from the diploid *S. aria* in having larger leaves and fruits, and in ploidy level.

At least 35 plants are known on the cliffs of the West Crag of Craig Breidden, and two on the North Crag (Rich *et al.* 2005), to which it is endemic. It is I.U.C.N. (2001) 'Critically Endangered'.

Named in honour of Prof. Charles Stirton in recognition of his inspirational work in establishing the National Botanic Garden of Wales.

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