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Exotic *Amelanchier* species naturalised in Europe and their occurrence in Great Britain

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ABSTRACT

In Europe, three *Amelanchier* species of American origin are naturalised to a considerable extent: *A. spicata* (Lam.) K. Koch, *A. lamarckii* Schroeder and *A. confusa* Hylander. Only one of them, *A. lamarckii*, has been found hitherto in the British Isles. Its distribution is restricted mostly to southeastern England, especially to those parts where acid soils prevail. A detailed key and a preliminary list of localities are given.

INTRODUCTION

For more than 80 years, several exotic cultivated species of the genus *Amelanchier* (Rosaceae) have been naturalising themselves more and more in various parts of western, central and northern Europe. The taxonomy and distribution of these neophytes, however, has remained mostly doubtful and confused. In the last few years I have tried to clear up this interesting problem. The results are presented in my paper '*Amelanchier*-Arten als Neophyten in Europa' now in the press. As this publication is written in German, I am giving here a short summary in English with a key to the more important species and a list of the localities known to me of the only species that occurs in England.

TAXONOMY

In *Flora Europaea*, Franco (1968) gives an account of the genus *Amelanchier* which unfortunately contains several mistakes. Besides the indigenous *A. ovalis* Medic., he mentions two species as naturalised: *A. grandiflora* Rehder and *A. spicata* (Lam.) K. Koch, the latter being considered conspecific with *A. humilis* Wieg. In reality, however, there are three well-separated species which are naturalised. Moreover, my studies on nomenclature have led to some conclusions which are rather different from the opinions expressed in *Flora Europaea*. In order to prevent further confusion in the difficult taxonomy of the genus, I think it necessary to give the following corrections:

1. The statement in *Flora Europaea* that *A. spicata* (Lam.) K. Koch is conspecific with the American species *A. humilis* Wieg. is based on two views advocated only by Jones (1946). The first is that *A. stolonifera* Wieg. and *A. humilis* should be united, an opinion refuted by most other authoritative American taxonomists. The other is his conviction that *A. spicata* and *A. stolonifera* are synonyms, which is definitely wrong (Fernald 1946). To sum up, in my opinion *A. spicata* is not conspecific with *A. stolonifera*, much less with *A. humilis*. Neither of the two latter taxa has so far been found naturalised in Europe.

2. As I have pointed out briefly in *Taxon* (Schroeder 1968) and discussed more fully in the paper mentioned above, the name *A. grandiflora* Rehder cannot be applied to any of the species naturalised in Europe. The original description (Rehder 1920) agrees in several respects (but not in all) with the species I have named *A. lamarckii* (see below). A herbarium sheet stated in Rehder's handwriting to be the 'type' (Herbarium of the Arnold Arboretum) is, however, quite different both from his description and from *A. lamarckii*. It seems to belong to the true *A. canadensis* (L.) Medic. The marked difference between the description and the type, which may be due to a confusion of herbarium material, makes it impossible to decide now what Rehder really meant by his new species. Therefore the name *A. grandiflora* is to be considered a *nomen confusum*.

3. The taxon which is most widely cultivated in western and central Europe and which is extensively naturalised in the Netherlands and north-west Germany as well as in parts of southern England, has hitherto usually been erroneously called *A. canadensis* (L.) Medic. In recent years it has often been wrongly transferred to *A. laevis* Wieg., *A. intermedia* Spach, *A. confusa* Hyl. or *A. grandiflora* Rehder. It has, however, already been described very adequately by Lamarck (1783) as *Crataegus racemosa*. As the specific epithet *racemosa* is, for nomenclatural reasons, not applicable in the genus *Amelanchier*, I have replaced it (Schroeder 1968) by the *nomen novum*, *A. lamarckii*.

4. In Sweden, another *Amelanchier* taxon has been cultivated under the name *A. canadensis*. This too is also naturalised to a considerable extent. It has been described as a new species, *A. confusa*, by Hylander (1966). *A. confusa* is very different from *A. lamarckii* and may by no means be treated as a synonym of the latter (or included under *A. grandiflora* as in *Flora Europaea*). It is, in fact, a third naturalised species which must be considered as a permanent member of the European flora.

To sum up, the four important *Amelanchier* species native or naturalised in Europe are:

A. ovalis Medicus, *Gesch. Bot.*, p. 79 (1793)
A. spicata (Lam.) K. Koch, *Dendrologie*, **1**: 182 (1869)
A. confusa Hylander, *Lustgården*, **45/46**: 273–274 (1966)
A. lamarckii Schroeder, *Taxon*, **17**: 633 (1968)

These can be identified using the following key:

1. Styles very short, about 1 mm long, not exceeding the hypanthium. Petals often woolly outside. Leaves 2·5–5 cm long, mostly rounded at the apex, coarsely crenate with about 3–5 rounded teeth per cm. Upright or spreading shrub up to 3 m .. .. *A. ovalis*

   Styles 2·5–4 mm long, clearly exceeding the hypanthium, connate at least at the base, often to $\frac{1}{3}$ or even $\frac{2}{3}$ of their length. Petals glabrous or only ciliate at the apex. Leaves finely or coarsely serrate with acuminate teeth. Taller shrubs up to 6 m or more 2

2. Inflorescences erect, dense, the lowest pedicels not much longer than the rest. Petals 6–10 mm long, obovate, about twice as long as wide, ciliate at apex. Top of ovary densely woolly. Calyx on mature fruits erect or spreading. Young leaves at flowering time light green or somewhat olive green, with

dense floccose yellowish tomentum beneath. Mature leaves 3–6 cm long, broadly elliptical or obovate to nearly orbicular, rounded to cordate at base, rounded or shortly acuminate at apex, mucronate, finely serrate with about 5–7 teeth per cm. Fastigiate shrub up to 8 m, without conspicuous autumn colouring .. .. *A. spicata*

Inflorescences ascending or nodding, lax, the lowest pedicels often much longer than the rest. Petals 10–15 mm long, oblanceolate, at least three times as long as wide, glabrous. Young leaves at flowering time glabrous or only silky-hairy beneath 3

3. Top of ovary woolly. Calyx on mature fruits strongly recurved. Young leaves at flowering time mostly flat, light green, often with light red patches between the veins, glabrous on both sides or with a few residual areas of thin white silky tomentum beneath. Mature leaves 3–5·5 cm long, ovate, broadly cuneate to subcordate at base, acuminate from the middle, mucronate, irregularly and mostly coarsely serrate with about 2–6 teeth per cm. Fastigiate shrub up to 6 m, without conspicuous autumn colouring .. *A. confusa*

Top of ovary glabrous. Calyx on mature fruits erect or spreading, not recurved. Young leaves at flowering time about half open, intensely purplish or copper-coloured, white silky-hairy beneath. Mature leaves 4·5–8·5 cm long, obovate to oblong or elliptical, rounded or subcordate at base, shortly acuminate in the upper third, mucronate, finely and regularly serrate with about 5–7 teeth per cm. Tall shrub or small tree up to 10 m, with divergent branches and very conspicuous yellow, orange or crimson autumn colouring .. .. *A. lamarckii*

The three naturalised taxa are undoubtedly of North American origin, but none of them is known as a distinct species in North America. They must be considered as microspecies, which have been overlooked or taken for hybrids in their native country because of their intermediary positions between several other well-known and widely distributed species. The suggestion that they might be hybrids that have arisen in European gardens (neogenic endemics) cannot be taken seriously. In Europe, the three species have been found naturalised in the following countries (abbreviations as in *Flora Europaea*):

A. spicata: Au Be Cz Da Fe Ge Ho No Rs(B) Rs(C) Su
A. confusa: Su
A. lamarckii: Be Br Da Ge Ho Su

Besides these three widespread neophytes, some other exotic taxa occur as ornamentals in gardens and parks. *A. laevis* Wieg. and *A. asiatica* (Sieb. & Zucc.) Endl., in particular, are now increasingly cultivated, as is to a lesser extent *A. stolonifera* Wieg. Therefore these species may be expected to escape from gardens in the future. In the 19th century *A. alnifolia* Nutt. and *A. lamarckii* var. *scharnkeana* (Aschers. & Graebn.) Schroeder (Schroeder 1968) were planted in several large parks and gardens. Both taxa, which seem to be cultivated no longer, have been found growing wild in two and three localities respectively. In contrast, the true *A. canadensis* (L.) Medic. exists only as a rarity in some botanic gardens, and *A. arborea* (Michx.f.) Fern. seems to occur more rarely still. A key to most of the exotic species (though containing the confusing incorrect names *A. spicata* and *A. stolonifera*) may be found in Krüssmann (1960).

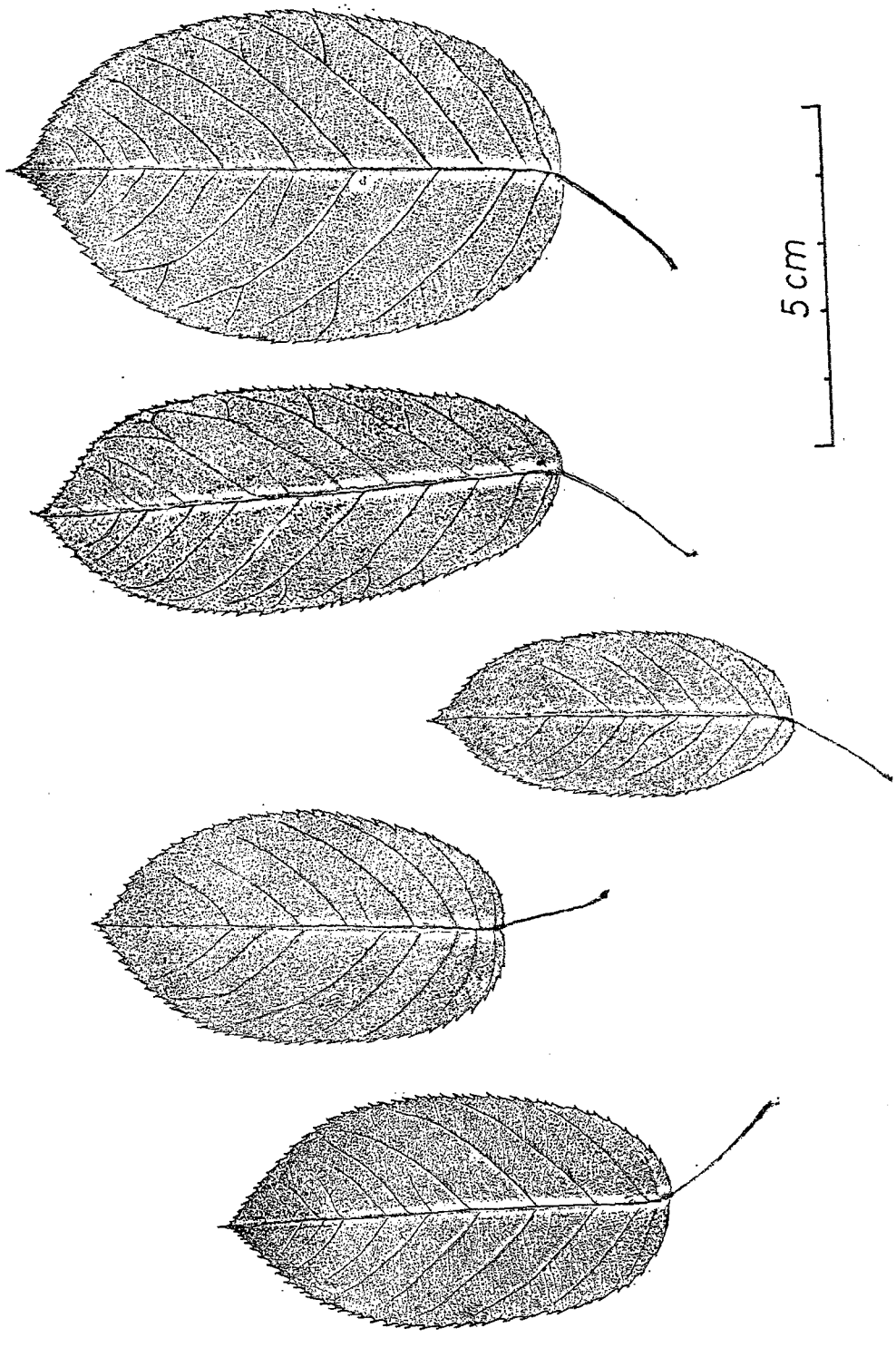

FIGURE 1. *Amelanchier lamarckii*, typical leaves.

PRELIMINARY REPORT ON THE DISTRIBUTION IN ENGLAND

In British floristic literature, several records of naturalised Amelanchiers may be found. As in other European countries, there is no unanimity concerning the taxonomic position of the naturalised specimens. The modern Floras (e.g. Clapham, Tutin & Warburg 1962) mostly quote *A. laevis*, but other species such as *A. canadensis*, *A. confusa*, *A. intermedia* or *A. alnifolia* are also mentioned as naturalised. The descriptions given in the Floras are often combinations of field notes and extracts from American literature, and therefore it is rather difficult to decide which species are really present as neophytes in Great Britain.

In the course of my investigations, I had the opportunity to see the material of several important British herbaria, and in 1968 I visited the wild *Amelanchier* population at Hurtwood in Surrey. All the specimens I have seen—dried and living ones—belong clearly to *Amelanchier lamarckii*, the species that is so frequent in the Netherlands and north-west Germany. Therefore it may be supposed, for the present, that *A. lamarckii* is the only species naturalised in Great Britain. Certainly it is the most widely distributed one, even if individuals of other species should be detected in the future.

In order to facilitate identification, I have, in addition to the description in the key, illustrated typical leaves of *A. lamarckii* (Fig. 1). A drawing which depicts the habit of flowering and fruiting twigs very well may be found under the name of *A. laevis* in Clapham, Tutin & Warburg (1960), while the drawings by Hadfield (1959, 1969) are not so characteristic, though they give some details more accurately. A translation of my synoptical table showing the differences between *A. lamarckii*, *A. laevis*, *A. arborea* and *A. canadensis* has been published by McClintock (1969). For further details I refer to my publications mentioned above.

The only records of naturalised Amelanchiers in the British Isles which I could get refer to England, and most of them are from the south-eastern part of the country. Even in this district the distribution is not uniform. Obviously there are distribution centres in areas with predominating acid soils: the Eocene beds of the New Forest and the Bagshot-Camberley region, and the areas of Cretaceous sandstones. This reflects the ecological requirements of *A. lamarckii*, which, both in Britain and on the Continent, is restricted to acid, mostly sandy soils of rather variable water content. In Hurtwood, Surrey, *A. lamarckii* is a member of forest and hedge communities belonging to the vegetation type called Querco-Betuletum by continental botanists, and the descriptions indicate similar vegetation also in several other localities. This corresponds well with the situation in the Netherlands and in north-west Germany, where the Querco-Betuletum and the shrub communities replacing it are the typical habitat of *A. lamarckii*.

The following preliminary list of records that I have so far been able to obtain together with the distribution map (Fig. 2) do not claim to be complete. I intend only to draw attention to the problem. The list has been compiled from the data I found in herbaria and literature, and, for the most part, from many private records of several botanists, which I obtained with the aid of Mr D. McClintock and Dr H. J. M. Bowen. It is a pleasure to me to acknowledge the friendly assistance I obtained from these two gentlemen and likewise from the keepers of the herbaria mentioned below.

LIST OF RECORDS

ABBREVIATIONS AND SIGNS USED IN THE LIST

Herbaria:

BM London, British Museum (Natural History)
K Kew, Royal Botanic Gardens
LTR Leicester University, Department of Botany
OXF Oxford University, Botany School

Literature (for titles see under References):

B Bowen 1968
DR Druce 1926
DU Dunn 1893
KL Kent & Lousley 1953
S Salmon 1931
WD Wolley-Dod 1937

Other sources:

BL Bowen by letter
MC McClintock by letter
R Data from an unpublished Flora of Kent by Dr F. Rose, communicated by McClintock
Y Data from an unpublished record list by Mrs Yule, Godshill, Hants., communicated by McClintock

! = Specimens seen by the author and identified as *Amelanchier lamarckii*

v.c. **9**, DORSET: Upton near Poole, a few trees in a hedge, 1956 (BL); Osmington near Weymouth, 1956 (MC); Broadstone near Poole, on the main road A349 (MC).

v.c. **11**, SOUTH HAMPSHIRE (all records from Y, unless indicated otherwise): Ashley Heath area; St Ives, heathy roadsides, well established, on the borders of the New Forest (BL); Iford area near Christchurch; Nea Croft area near Christchurch; Holmsley, 1933 (**OXF**, as *A. laevis*)!; Wootton; Sway, Set Thorne; Bolderwood; Hollands Wood, Ramnor; Clay Hill; Fletchwood; Ashurst, Langley Wood; Marchwood; Stanswood and Hillhead; Rownhams; Chilworth; Ampfield near Romsey (MC); north of Chandlers Ford; each side of Fareham–Winchester road near Fair Oak.

v.c. **12**, NORTH HAMPSHIRE: Liss Forest, Woolmer Forest (Y); Passfield, Headley Down (Y); Kingsley, Fleet, 1950 (**K**, as *A. laevis*)!; Fleet area, Aldershot, between Blackwater and Hartley–Wintney, about a mile south of where the main road goes over Hartford Bridge Flats, two specimens growing on a wild bit of heath but with the roots on the edge of a boggy ditch, 1923 (**OXF**, as *A. canadensis* or *A. laevis*)!; north of Mortimer to county border (Y.)

v.c. **13**, WEST SUSSEX: Midhurst, growing in a wood, where there seems to be a lot of it, probably either planted or bird sown, 1923 (**BM**, **OXF**, as *A. florida*)!; Blackdown, above Valewood House amongst planted pines, 1924 (**OXF**, as *A. canadensis*)!; Storrington, in a wild spot, 1926 (**OXF**, as *Crataegus* sp.)!; Slinfold near Horsham (WD).

v.c. **14**, EAST SUSSEX: Mayfield (WD); forests on sandstone south of the county border near Tunbridge Wells, 1968 (communicated by D. W. Shimwell).

v.c. **16**, WEST KENT: Tunbridge Wells Common, 1937 (R); Kenward Green, Pembury, near Tunbridge Wells, 1962 (R); Cranbrook, Angley Wood, 1956 (R); Parsons Marsh, Brasted (near Scords Wood), a strong colony, 1960 (R); Hosey Common, 1953 (KL); Crockhamhill Common, 1939 (R).

v.c. **17**, SURREY: Oxshott Heath (KL); Bagshot Heath, naturalised at Lightwater, 1958 (**K**, as *A. arborea*)!; Windlesham, self-sown in thickets by the road on acid soil, 1969 (BL)!; Deepcut Camp, before 1921 (**BM**, as *A. canadensis*)!; Copses about Witley and Thursley (DU); Hurtwood: from this forest area on Lower Greensand naturalised Amelanchiers have been known since as long ago as 1893 (DU). Clapham, Tutin & Warburg (1962) record '*A. laevis*' as 'common over several square miles in the Hurtwood'. My visit in 1968 showed, however, that the distribution is not so extensive. The densest population of *A. lamarckii* that I found was in the parts lying west of the road from Peaslake to Ewhurst, especially in a strip extending from the margin of Peaslake about 1 mile to the south-southwest, where many large shrubs and numerous seedlings are present. On a herbarium label written by Dr Warburg (**OXF**) this locality is referred to as 'Bentley Copse near Shere', and the forest structure is quite adequately described there as 'Oak coppice with pine, rowan, whitebeam, ling and bilberry', to which may be added holly, birch and alder-buckthorn. In other parts of the Hurtwood area I saw scattered specimens on Holmbury Hill and about ½ mile east of Leith Hill. Further records exist from Park Wood near Albury (S), Farley Green (S) and Westcott Heath (**LTR**)!.

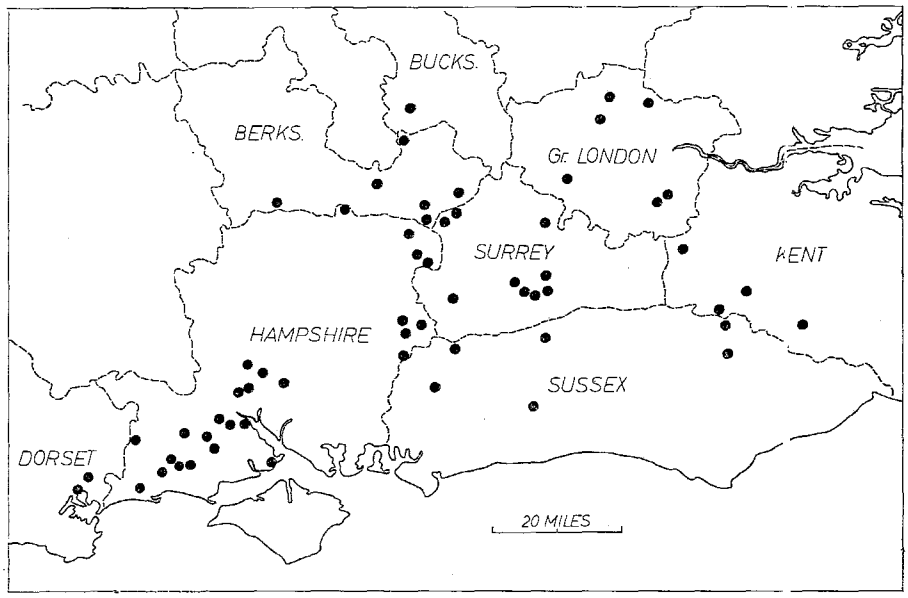

FIGURE 2. Distribution of *Amelanchier lamarckii* in southern England.

GREATER LONDON. v.c. **16**, WEST KENT: Hayes Common, 1911 (KL), 1918 (**OXF**, as *A. canadensis*)!; Bromley, Fishers Wood, 1961 (R). v.c. **17**, SURREY: Richmond, Ham Common, 1943 (KL), 1953 (**BM**, as *A. laevis*)!. v.c. **18**, SOUTH ESSEX: Walthamstow, Cook's Folly Wood, 1899 (**BM**, as *A. canadensis*)!. v.c. **21**, MIDDLESEX: North End, Hampstead, 1916, 1949 (KL); Kenwood, 1950 (KL); East Finchley Wood, 1887, 1912 (KL).

v.c. **22**, BERKSHIRE: '*Amelanchier*, when naturalised in Berks, grows in small colonies which spread quite fast if not destroyed by fire or the axe. Such colonies are confined to acid, fairly dry soils similar to those in N. Surrey, the New Forest

and also on the N. German plain. Associated woody plants include *Betula pendula*, *B. pubescens*, *Frangula alnus*, *Sorbus aucuparia*, *Calluna vulgaris* and *Vaccinium myrtillus*, together with the well naturalised alien *Rhododendron ponticum*' (BL); Newbury, Inholmes (B); Reading, Ufton park, acid wood margin, 1961 (B, BL); Whiteknights Park, 1969 (BL)!; Ashley Hill near Henley, acid woodland (B, BL); Crowthorne, Heath Lake and Wellington College, woods on acid, sandy soil (B, BL); Sandhurst, woodland on very acid soil (B, BL); Ascot, quite naturalised in woods, 1915 (**OXF**, **BM**, as *A. canadensis*)!.

v.c. **24**, BUCKINGHAMSHIRE: In a wood near Lane End, 1915 (DR; **OXF**, as *A. canadensis*)!.

v.c. **69**, WESTMORLAND and NORTH LANCASHIRE (not shown in Fig. 2): Broughton-in-Furness, on peat mosses, 1962 (**K**, as *A. laevis*)!; Islands of Windermere, 1891 (**BM**, as *A. canadensis*)!.

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