

Alchemilla gracilis Opiz, a species new to the British flora

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ABSTRACT

Alchemilla gracilis Opiz, a widespread species in northern and Central Europe not previously known with certainty in the British Isles, was found in 1976 in Northumberland. The diagnostic characters of the species are described, and its status in Britain is discussed in the light of the distribution of related *Alchemilla* species.

INTRODUCTION

In May 1976 G.A.S. was informed by Mr M. Braithwaite, a local botanist, of an interesting site near Cockplay, north-west of Hexham, Northumberland, v.c. 67, where the sheep-grazed turf of an old lime quarry contained some local plant species. He visited the locality on 13th June 1976 and made a detailed species list, which included *Alchemilla filicaulis* subsp. *vestita* (earlier identified by Mr Braithwaite) and a second, quite distinct *Alchemilla* which G.A.S. was unable to identify. He therefore collected a small quantity of flowering material and sent the pressed specimens at the end of the season to S.M.W. for determination. These were, unfortunately, not examined by S.M.W. until December 1977, but when they were finally dealt with, they turned out to be the European *Alchemilla* species, *A. gracilis* Opiz, never previously certainly reported in Britain. On 16th June 1978, S.M.W., together with G.A.S. and some botanical colleagues, visited the site and studied the population in detail; they also saw two other nearby sites where the species had been discovered by Mr Braithwaite since the confirmation of the plant at the original locality.

(S.M.W. apologises for the inordinate delay in publishing details of this remarkable discovery, and wishes to make clear that he has been solely responsible for that delay.)

ALCHEMILLA GRACILIS AND ITS DISTINCTION FROM OTHER SPECIES OF ALCHEMILLA

Alchemilla gracilis (*A. micans* Buser) belongs to a group of microspecies of the *Alchemilla vulgaris* aggregate which are reasonably well characterised on morphological, distributional and ecological grounds. They are in the subseries *Hirsutae* H. Lindb., species 41-53 in the treatment in *Flora Europaea* (Walters 1968; see also Lippert & Merxmüller 1975). Three of them constitute a remarkable group of continental *Alchemilla* species centred on Upper Teesdale in Britain: these are *A. monticola* Opiz, *A. subcrenata* Buser and *A. acutiloba* Opiz, all medium to large plants with spreading hairs present on stems and petioles and (at least to some extent) on both surfaces of the leaves. In many parts of Central and northern Europe these three species are frequently found growing together, in hay-meadows, on roadsides, etc., and are often accompanied by the fourth member of the group, *A. gracilis*. In sub-alpine regions of Central Europe, and in parts of Scandinavia, the common 'vulgaris' *Alchemillas* belong to this group, *A. monticola* being in general the commonest of all.

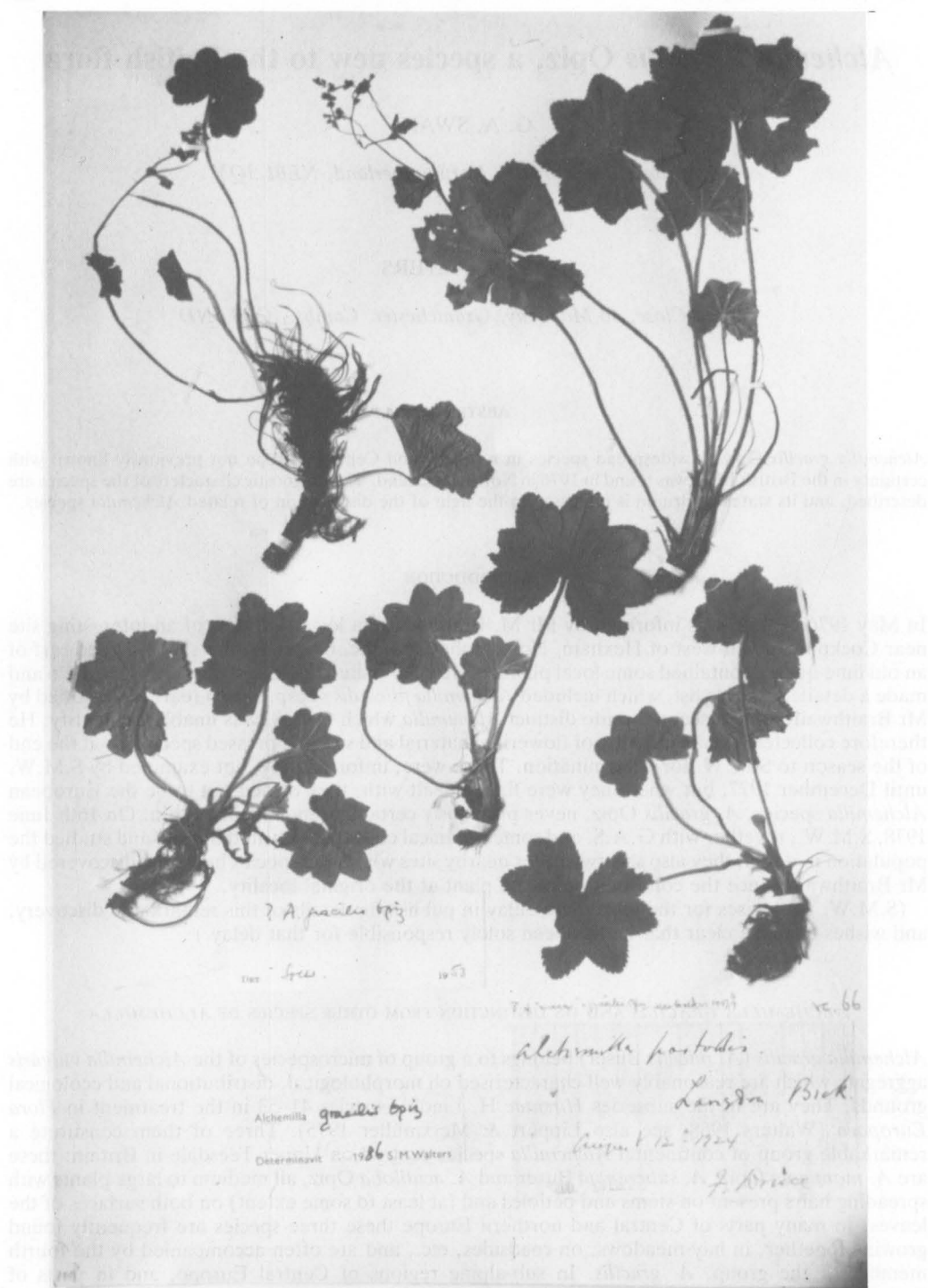


PLATE 1. Herbarium specimen of *Alchemilla gracilis* collected in Teesdale in 1924. (Photograph by P. F. Yeo).

In view of this general pattern of correlated distribution in Europe, the possibility that *A. gracilis* was also a member of the Upper Teesdale flora has long been in the minds of British botanists studying *Alchemilla*; thus Walters (1949, 1952) wrote "*A. gracilis* Opiz . . . should be looked for in Teesdale, particularly in view of the fact that there is a single inadequate specimen (Druce in Herb. Mus. Brit.) which is doubtfully referable to this species." This specimen, annotated by A. J. Wilmott as doubtfully attributable to *A. gracilis* by S.M.W. in 1947, and seen again and annotated by S.M.W. in 1953, lay neglected in the British Herbarium at BM until G.A.S. re-found it after his discovery of the living plant in Northumberland. The reason for this neglect was two-fold. S.M.W. was in any case cautious in identifying the plant from a single gathering, and the very detailed study conducted during the 1950s by Dr Margaret Bradshaw failed to discover any *A. gracilis* in the Upper Teesdale area. (See Bradshaw (1962, 1985) for comments on this.)

The sheet in question is, however, undoubtedly referable to *A. gracilis*. It was collected (as '*A. pastoralis*', i.e. *A. monticola*) by Francis Druce at Langdon Beck in Upper Teesdale on 12th August 1924. The material is quite adequate for critical determination, although much of the ripe fruit has already been shed from the inflorescences. It is probably 'second-growth' material from a rather disturbed, perhaps road-side, habitat. Such plants growing with *A. monticola* and *A. acutiloba* are not easy to detect. This sheet remains the sole evidence that *A. gracilis* grows (or once grew) in Teesdale (Plate 1).

The unequivocal identification of *Alchemilla* microspecies depends on the availability of well-grown summer flowering specimens complete with some basal leaves. Grazed plants, even if flowering, and second growth late in the season may be unidentifiable. On the other hand, the characters of importance in *Alchemilla* taxonomy, especially the hairiness and leaf-shape, are retained very satisfactorily in well-prepared pressed specimens, so that detailed study is entirely practicable in the herbarium. It is further true that some *Alchemilla* species have very characteristic appearances in the living state so that, with experience, field identification of technically inadequate material may be entirely reliable. This is the case with *A. gracilis*, and it is interesting that G.A.S., who had never seen the plant before, saw that even in its grazed state it was quite distinct from *A. filicaulis* subsp. *vestita* with which it was growing.

The characters shared by the group of four widespread European *Alchemilla* species related to *A. monticola* can be listed as follows:

1. Petioles and (at least) lower part of stems with erecto-patent or patent hairs (i.e. spreading at approx. 45° or 90°). This separates *A. glabra*, a common species in Northern England and Scotland, which has sparse, appressed hairs on petioles and the lower part of stems.
2. Upper surface of mature summer leaves hairy at least in the folds. This separates the other common northern British *Alchemilla*, *A. xanthochlora*, which has glabrous upper leaf surfaces.
3. At least the pedicels of the flowers glabrous. This separates *A. filicaulis* subsp. *vestita*, the most widely-distributed British species, which has some hairs even on the pedicels, and also the (very local) *A. glaucescens*, a relatively small plant with dense indumentum throughout all parts of the plant.

Plants possessing leaves with hairs on the upper surface are therefore worth careful inspection: if the pedicels (and especially if the inflorescence in general) are glabrous, then the species is likely to be a rare or local one in Britain.

Within this group of species related to *A. monticola*, discrimination of *A. gracilis* is easy, because the hair covering, especially on the petioles, is erecto-patent (45° angle), *not* more or less patent (90°). This quality in the indumentum is shown also on the leaf-surfaces and particularly on the veins beneath the leaf, and gives the live plant a characteristic silky sheen (referred to in the name *A. micans* given to the species by Buser). Indeed, the indumentum sometimes approaches that of the arctic-alpine species *A. glomerulans*, though leaf-shape and particularly hypanthium-shape easily distinguish the two species. Growing in grazed turf mixed with *A. filicaulis*, *A. gracilis* can readily be picked out by the silky erecto-patent hair covering: as G.A.S. demonstrated in the field in 1978, individual leaves could also be distinguished in that they were usually 9-lobed, whereas the *A. filicaulis* leaves were 7-lobed.

Two other diagnostic features are shown by *A. gracilis*. The first, which seems to be very reliable even in grazed material which may have only poorly-developed inflorescences, is the shape of the hypanthium in flower. Uniquely in *A. gracilis* this is narrow with a base cuneate in outline (see Fig. 1). If the inflorescence is reasonably well-grown, the other diagnostic feature becomes evident: the

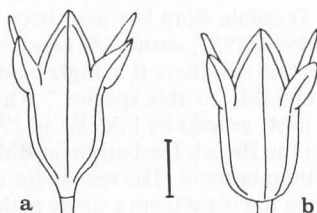


FIGURE 1. Diagram of hypanthium shape in (a) *Alchemilla gracilis*, (b) other British species of the subseries *Hirsutae*. (Adapted from Lippert & Merxmüller 1975.) Scale bar = 1 cm.

branching of the inflorescence is rather sparse, and the whole inflorescence is narrow and relatively few-flowered. Combined with the erecto-patent or even sub-appressed indumentum, this gives the inflorescence a very characteristic appearance (Plate 1). Leaf-shape, as in most *Alchemilla* species, is too variable to be a very reliable diagnostic character, but a well-grown summer leaf of *A. gracilis* is reniform to reniform-orbicular in outline, with a narrow but open sinus (that is, the lobes do not overlap to cover the junction of the blade and the petiole). In this respect the leaf is rather intermediate in shape between the reniform leaf of *A. filicaulis*, which usually has quite a wide sinus, and the more or less orbicular leaf of *A. monticola* in which the basal lobes usually overlap. (The coloured illustrations of leaves of *Alchemilla* in Garrard & Streeter (1983) include *A. gracilis*, and are recommended for their accuracy.)

The early flowering of *A. gracilis* seems to differentiate it from most other *Alchemilla* species with which it might be confused. Thus, G.A.S. recorded it in full flower at the Cockplay locality on 16th May 1984, at least one week in advance of *A. filicaulis* subsp. *vestita* growing with it. Plants which S.M.W. has cultivated (from one of the Coldwell localities) since 1978 also come into flower early every year. If this phenological difference is consistent, it may explain why the species remained undetected for so long in mixed populations, for the inflorescences in cultivation are shedding ripe seed and becoming relatively inconspicuous by late June or early July, and the whole plant could become covered by competing vegetation in the wild.

DESCRIPTION OF THE LOCALITIES

In the locality near Cockplay, where G.A.S. first detected the plant, the population in June 1978 was estimated to contain in the main site some 100 separate plants (or small clumps) mostly concentrated in an area of some 30 × 10 m of heavily-grazed, more or less closed, grassland turf.¹ Nearby, in the same field, a smaller population in more broken turf on a small limestone outcrop contained an estimated 30 or 40 plants. In the main site, there was some admixture with *A. filicaulis* subsp. *vestita*, and in the subsidiary site the two species of *Alchemilla* seemed about equally common. The history of the site is not known, but is presumed to have been worked for lime; it is on the junction of limestone and the Whin Sill rock, and the surface limestone explains the exceptionally species-rich grassland turf. Associated species listed on 13th June 1978 were: *Agrostis capillaris*, *Anthoxanthum odoratum*, **Avenula pratensis*, *Bellis perennis*, *Briza media*, *Cerastium fontanum*, *Cynosurus cristatus*, *Deschampsia cespitosa*, *Festuca ovina*, *F. rubra*, **Galium verum*, *Holcus lanatus*, **Koeleria macrantha*, *Lotus corniculatus*, *Plantago lanceolata*, **Plantago media*, *Potentilla erecta*, *Ranunculus bulbosus*, *Sanguisorba minor*, *Taraxacum* cf. *brachyglossum*, *Thymus drucei*, *Trifolium pratense*, *T. repens*, *Viola riviniana*. (*Species indicating relatively calcareous soil.)

The two other localities discovered in 1978 are near Coldwell, about 1 km from the original one. Both sites were visited on 13th June 1978 and in one of these there was a small population of

¹ This estimate was, apparently, too small: Dr A. J. Richards surveyed the population on 8th May 1984 and estimated the flowering plants of *A. gracilis* to number 800 ± 100.

A. gracilis in a damp corner of a roughly-grazed pasture. At the other locality nearby, there were a few clumps of separate individual plants with lax, somewhat etiolated inflorescences up to 50 cm tall growing in lush ungrazed meadow with competition from tall coarse grasses, especially *Dactylis glomerata*. Associated spp. here were: *Alopecurus pratensis*, *Bellis perennis*, *Cerastium fontanum*, *Cirsium arvense*, *Cynosurus cristatus*, *Festuca rubra*, *Lolium perenne*, *Plantago lanceolata*, *Plantago major*, *Poa annua*, *Poa trivialis*, *Ranunculus acris*, *Rumex acetosa*, *Rumex obtusifolius*, *Taraxacum* sp., *Veronica chamaedrys*, *Veronica serpyllifolia*.

Neither locality showed any unusually rare or local species, and indeed seemed quite unremarkable. In the ungrazed meadow, the lack of grazing was possibly a recent factor: some species (including the *Alchemilla* itself) seemed rather etiolated and not well adapted to the vigorous competition by the grasses.

After 1978, G.A.S. kept a sharp look-out during extensive botanical study of Northumberland for new localities for *A. gracilis*, but it was not until 1985 that he was successful. The new locality near Sharpley is in the general area of the 1976 discoveries, and consists of grassland on a roadside verge, where *A. gracilis* was found growing with *A. filicaulis* subsp. *vestita*. The adjacent field had relatively species-rich calcareous grassland with much *Poterium sanguisorba* and other calcicoles such as *Plantago media*, but G.A.S. could not find *A. gracilis* in the field.

STATUS AND DISTRIBUTIONAL SIGNIFICANCE

A. gracilis, as we have explained, has a wide distribution in Central and northern Europe essentially similar to that of the other three related species *A. monticola*, *A. subcrenata* and *A. acutiloba*; such distributions are characterised as Northern-Montane (Matthews 1955) and are shown by several other British species, including e.g. *Primula farinosa*. Its discovery in the north of England is therefore not unexpected. On the other hand, the three other species are centred in the Upper Teesdale area (if we neglect two apparently casual and non-persistent records for *A. monticola* elsewhere), where the flora already has a remarkable assemblage of rare and local species, including two other *Alchemilla* species, *A. glomerulans* and *A. wichurae*, with montane distributions in Britain.

Bradshaw (1962) discusses the status of the Northern-Montane group of *Alchemilla* species in the Teesdale area, and concludes that a hypothesis of survival and secondary expansion from a wider Late-Glacial distribution, which might reasonably be applied to the Arctic or Arctic-alpine species *A. wichurae* and *A. glomerulans*, has little to support it for the Northern-Montane group, though clearly it cannot be ruled out. She points to the almost complete absence for these three species of any natural habitats. They are strongly synanthropic, both in Teesdale and also in Scandinavia where much information is available (see especially Sjörs (1954) and Samuelsson (1943)). She considers the possibility of accidental introduction as hay-meadow 'weeds', or even intentional introduction as medicinal '*Alchemilla vulgaris*' in historic time, and concludes that the question of their origin remains an entirely open one.

Samuelsson (1943) gives a detailed discussion of the Scandinavian distribution of *A. gracilis*, and shows that it is not significantly different from that of *A. monticola* and *A. acutiloba* – except that there is a curious, unexplained absence from Western Finland, a feature not shown by the other two species. Even more so than *A. monticola*, *A. gracilis* is a ruderal plant in Scandinavia, being particularly common in artificial park grassland and on roadsides, but readily colonizing from such sites into hay meadows and pastures. The spread of the species in recent historic time is reasonably well documented in particular localities both in Norway and Sweden where the *Alchemilla* flora has been critically surveyed over a sufficiently long period to record such a spread. Thus Samuelsson himself was certain that the species spread in his own life-time in the vicinity of his birthplace (the town of Strängnäs in Södermanland) from an initial record in 1910. This assessment accords well with the fact that Sjörs (1954) does not record *A. gracilis* from the (relatively old) synanthropic hay meadow communities of Dalarna (Sweden) where he made a special study. Indeed, it seems that throughout Fennoscandia *A. gracilis* occurs rarely in even semi-natural habitats until one reaches the Finnish-Russian frontier region, where it is recorded in open deciduous woodland and assessed as a truly native species (Fagerström 1939–40; cited in Samuelsson 1943, p. 35). In European Russia, the species is common in a variety of habitats; for

example, Tikhomirov (1969) states that in the Moscow region: "it often grows in abundance" and "possesses perhaps the broadest ecological range among our [species of *Alchemilla*], being often found in dry meadows, on hillsides, in shady forests, etc." The species extends into W. Siberia, outside the boundary of Europe as adopted for *Flora Europaea* (see Juzepczuk, 1941, p. 348).

The nearest Continental localities to Britain are in the Low Countries; here there seems to be some evidence that *A. gracilis* is still extending its range, though the belated recognition of the species in the flora of a particular country cannot, obviously, by itself be taken as evidence of its recent introduction. For a discussion of the status of the species in Belgium see Sougnez & Lawalrée (1956, 1959), and in Luxembourg see Reichling (1969).

What light does this throw on the newly-discovered British occurrences of *A. gracilis*? Firstly, we can say that, since they are all within a small area, a relatively recent introduction and spread from a Continental source seems quite probable. On the other hand the Cockplay locality – grazed limestone turf – is emphatically *not* a crudely artificial new habitat, and the population there certainly gives the impression of relative age. Secondly, we have to admit that there is a great deal of northern England for which systematic and careful *Alchemilla* recording, such as Bradshaw (1962) undertook for Teesdale and Weardale, has not been done, so that we have no idea whether the newly-discovered *Alchemilla* is really so rare and local. If we have to conclude with Bradshaw that the case for the native status of the Northern-Montane Teesdale *Alchemillas* is wholly uncertain, the same doubt must remain over the Northumberland records of *A. gracilis*. It is a challenge to sharp-eyed northern botanists to extend the known range of this interesting addition to the British flora.

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