



Common problems with field identification – the *Polygonum aviculare* aggregate

BOB LEANEY

As defined by Stace (2019), this aggregate includes four taxa:

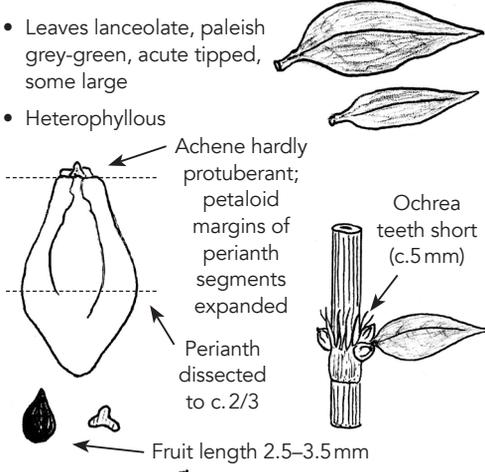
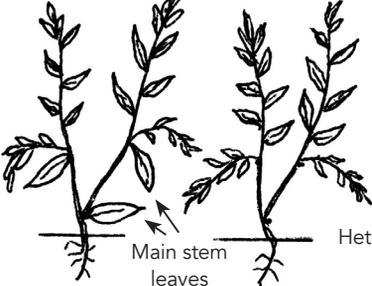
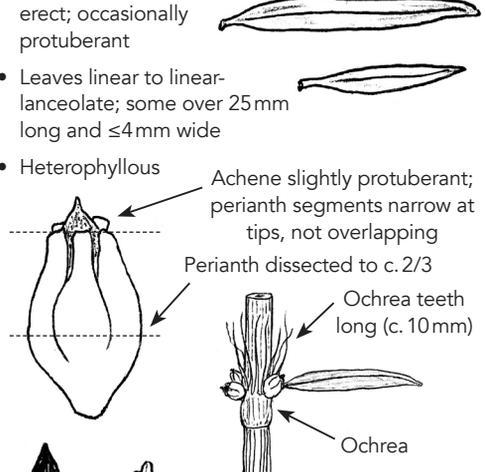
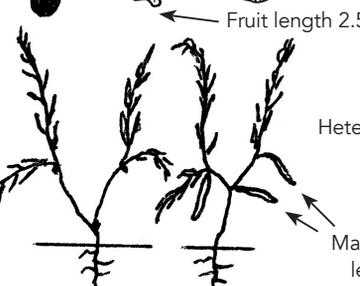
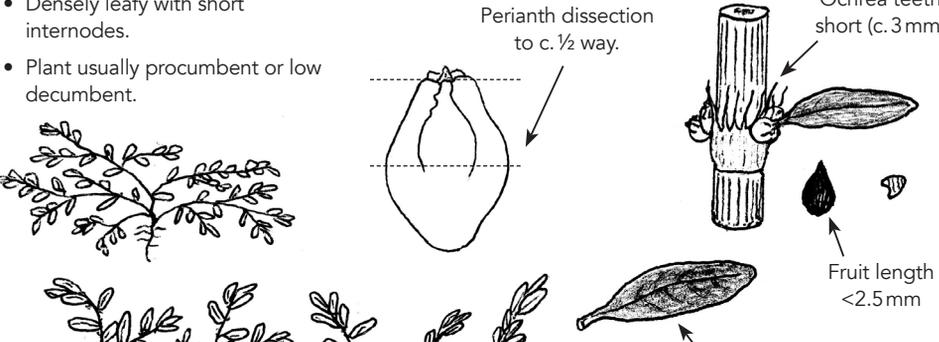
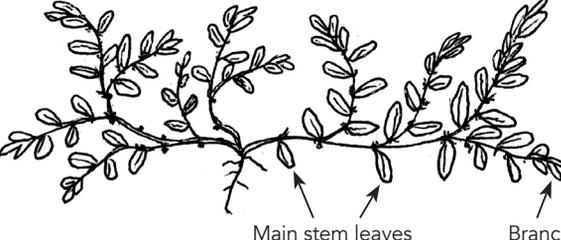
- *Polygonum depressum* (syn. *P. arenastrum*) – Equal-leaved Knotgrass;
- *Polygonum aviculare* s.s. – Knotgrass;
- *Polygonum boreale* – Northern Knotgrass; and
- *Polygonum rurivagum* – Cornfield Knotgrass.

The aggregate continues to cause problems on almost every meeting of the Norfolk Flora Group, both in separating *P. depressum* from *P. aviculare* s.s., and also in attempting to recognise *P. rurivagum*. The former problem is made worse by the fact that the main stem leaves subtending the branches, which are needed to demonstrate heterophylly or lack thereof, have usually fallen by the time the diagnostic floral and fruiting characters are apparent; but there are also frequent plants that seem intermediate and cannot be assigned to the usual species concept. Attempts to find *P. rurivagum* are virtually always fruitless, mainly I feel because this taxon, at least nowadays, is actually very rare!

Polygonum depressum (Equal-leaved Knotgrass): Low, decumbent form with all small, dark green, elliptic, blunt-tipped leaves. Bob Leaney

I have no experience of *P. boreale*, which is confined to Scotland, so will not deal with this taxon. It differs from the other three taxa within the complex mainly in having obovate leaves with quite long petioles that are well exerted from the ochreae (fused stipules).

Our usual nomenclature and identification characters derive from a large morphometric study by Styles almost 60 years ago (Styles, 1962). He recognised *P. aviculare* s.l. as being comprised of the four species listed above, and considered species status for *P. aviculare* and *P. depressum* as being ‘beyond doubt’. However, he was less sure of the specific status for *P. rurivagum*, and experienced considerable difficulty in tracing populations, either in the field or in herbarium collections. Styles’ study suggests that *P. rurivagum* was very scarce even in his time, and confirms the supposition that the species is rare rather than under-recorded nowadays.

<i>POLYGONUM AVICULARE</i> S.S.	<i>POLYGONUM RURIVAGUM</i>
<ul style="list-style-type: none"> • Procumbent to erect • Leaves lanceolate, paleish grey-green, acute tipped, some large • Heterophyllous  <p>  Main stem leaves Heterophyllous </p> <p>Main stem leaves often lost (applies to all spp.)</p>	<ul style="list-style-type: none"> • Usually ascending to erect; occasionally protuberant • Leaves linear to linear-lanceolate; some over 25 mm long and ≤4 mm wide • Heterophyllous  <p>  Main stem leaves Heterophyllous </p>
<i>POLYGONUM DEPRESSUM</i>	
<ul style="list-style-type: none"> • Densely leafy with short internodes. • Plant usually procumbent or low decumbent.  <p>  Main stem leaves Branch </p> <ul style="list-style-type: none"> • Leaves elliptic, dark green, blunt-tipped. • Leaves all small; main stem leaves same size as those on branches (but usually lost) (isophyllous). 	

Interestingly, another extensive morphometric study of the complex, by Meerts et al. (1990) in Belgium, found no plants corresponding to *P. rurivagum* and only enough clustering to assign *P. aviculare* and *P. aequale* (*P. depressum*) to subspecies status; similarly, Stace in his 4th edition Flora (Stace, 2019) states that the four taxa might be better treated as subspecies; the second Docks and Knotweeds Handbook (Akeroyd, 2014) takes a similar approach.

Polygonum aviculare and *P. depressum*

Polygonum aviculare and *P. depressum* can usually be separated by a combination of habit, leaf shape and leaf colour. *P. depressum* is characteristically procumbent to decumbent, and densely leafy, with short internodes; *P. aviculare* s.s. is usually ascending to erect and has a more open structure, but is frequently procumbent or decumbent on pavements or other trampled substrates.

Looking for heterophylly is usually precluded by the fact that the main stem leaves fall off early in both taxa, but the branch leaves are also very different: small, elliptic and dark green, with rounded to sub-acute tips in *P. depressum* and usually much larger, lanceolate to narrowly ovate and pale grey-green, with acute tips in *P. aviculare* s.s. Perianth dissection usually correlates well with these leaf characters: to about half way down in *P. depressum* and about two-thirds in *P. aviculare*. If leaf and perianth characters are equivocal, fruit length and shape can be very useful in this paring (but not in *P. aviculare* vs *P. rurivagum*). The achenes can be obtained by rubbing the flowers vigorously between the fingers and thumb, and the characteristic shape is best viewed by holding the fruit by the base and looking down at the pointed apex, or by transection with a scalpel blade at home later.

P. rurivagum

The main spotting feature for *P. rurivagum* is the very long, narrow leaf shape, which should be linear or linear-lanceolate, with a parallel-sided central section, not elliptic or broadly lanceolate. Short leaves with a width of below 4mm are not diagnostic; the leaves should be at least 25 mm long for a maximum width of 4 mm to be indicative of *P. rurivagum*. Another misconception that causes problems is the belief that red flower colour is diagnostic for *P. rurivagum*. Styles did describe the flowers of *P. aviculare* s.s. and *P. depressum* as ‘pink-purple’ and those of *P. rurivagum* as ‘red’, but dismissed flower colour as a reliable diagnostic character. Another common assumption is that the achenes of *P. rurivagum* are protuberant, but the degree of protuberance is very variable and not nearly as marked as in *P. oxyspermum* (Ray’s Knotgrass). The exposure of the achenes in *P. rurivagum* is mainly between the perianth segment tips, which are narrower and with less expanded, white petaloid margins than the other two taxa. Long ochreae teeth are another feature of *P. rurivagum* that is worth looking for (Poland & Clement, 2020).



Above: *Polygonum depressum* – low, decumbent form, all small, dark green, elliptic, blunt-tipped leaves and isophylly; right top: *P. aviculare* – long internodes, large, mid green, ovate to lanceolate, acute-tipped leaves and heterophylly; bottom right: *P. rurivagum* – long linear-lanceolate leaves <4mm wide and heterophylly. Bob Leaney



However, plants that fit *P. rurivagum* as regards leaf and flora characters can lack this feature, and often the teeth are so frayed and randomly directed as to be impossible to measure.

Conclusion

The majority of plants within the *P. aviculare* complex can be readily identified in the field using the bullet points shown in the illustration.

However, one finds a lot of intermediates between *P. aviculare* s.s. and *P. depressum*, mainly with regard to habit and leaf shape. The most frequent intermediates we seen in Norfolk have the ascending or erect habit and acute-tipped leaves of *P. aviculare* s.s., but the leaves are crowded together and uniformly small as in *P. depressum*. Such forms should usually be recorded as *P. aviculare* agg., but if it seems important to make the separation, material should be taken home for further examination. Perianth dissection, achene length and shape on transection should all point in one direction for a reliable identification to be made.

Suspected *P. rurivagum* should always be taken home, for this taxon is probably being over-recorded and in reality very scarce. Crucial to this determination is the finding of long, linear leaves, some at least 2.5 cm long, but <4 mm wide. Narrow tips to the perianth segments exposing the achenes should also be present on the majority of the flowers.

References

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Polygonum aviculare s.s. Note long internodes, large, mid green, ovate to lanceolate, acute-tipped leaves and heterophylly. John Norton



Polygonum depressum. Showing low, procumbent habit and all small, dark green, elliptic, blunt-tipped leaves. Mike Crewe



Polygonum rurivagum. Long linear-lanceolate leaves, <4mm wide and heterophylly. This photo also shows the slightly protruding achenes. John Norton