

Sitonas: *Sitona*, *Andrion*, *Coelositona*, and *Charagmus*

Sitona (not in italics) is used here for these four genera that all used to be included in *Sitona*. The combination of **large eyes**, rather **straight-sided** and **narrow wing-cases**, and **short antennae** distinguishes Sitonas from other broad-nosed weevils.

Compare: *Tanymecus palliatus* has longer antennae, long bristly cheeks, and it is larger than most Sitonas. *Phyllobius* and *Polydrusus* have smaller eyes and longer antennae, and usually longer front legs.

Sitōna= a purveyor of grain; Andrion = manikin, from the small size of the male; Coelositona = hollow *Sitona*; Charagmus = engraved or sculpted.

All the Sitonas feed on legumes (Fabaceae). Some are found only on gorse *Ulex* and broom *Cytisus*; others have a preference for vetches *Lathyrus* and *Vicia*; for clovers *Trifolium*; or for bird's-foot trefoils *Lotus*. Remember that the different foodplants are often found together, and the weevils can wander from their foodplants. *Sitona lineatus* in particular can appear almost anywhere, even if there is not a legume in sight.

This group includes some of our commonest weevils. It is not an easy group without a set of reference specimens, but fresh, fully scaled weevils are not so hard to name once you are familiar with them. Variation within a species is a source of confusion. This is easier to appreciate when you have a set of specimens of each species to compare. In this guide I have only been able to include one or two examples of each species, so your weevil may not be a perfect match for any of the illustrations here.

Often you will have a worn specimen, and then things get more troublesome. The shape of the eyes and the wing-cases are useful characters when scales have worn away, as is the underlying pattern of pits and the spaces between them, especially on the head and pronotum, but you need a good microscope and good lighting to see them. I find the length of the groove on the forehead difficult to judge, especially if the head still has a good covering of scales.

Some of the species are readily identifiable in the field: *Sitona lineatus*, *Andrion regensteinense*, *Charagmus griseus*, *Charagmus gressorius*, *Sitona hispidulus*, *Sitona humeralis*, *Sitona sulcifrons*, *Sitona waterhousei*, and *Sitona gemellatus* all have distinctive characters that are not too hard to see.

Others are less distinctive: *Sitona cylindricollis*, *Sitona macularius*, *Coelositona cinerascens*, and *Sitona lineellus*.

Then there are some difficult pairs: *Sitona ambiguus* and *striatellus*; *Coelositona cambricus* and *puberulus*; *Sitona obsoletus* and *puncticollis*; *Sitona suturalis* and *lateralis*. For the two *Coelositona*, you might need the aedeagus.

There have been two recent changes of names. *Sitona lepidus* is now being called *obsoletus*, and *Sitona ononidis* is *lateralis*. Note that *Sitona lineellus* was called *Sitona decipiens* in some older books, in which case the name *Sitona lineellus* was used for *Sitona ambiguus*. This brings much opportunity for confusion.



Sitona suturalis has a clear stripe down the suture.



Sitona lineatus is the most commonly recorded weevil.



Sitona obsoletus usually has three pale dots down each side of the pronotum.



Sitona sulcifrons has a sparse covering of metallic scales.

Bristles and scales

The scales on the body and wing-cases may be round, oval, narrow, or hair-like. The thick hair-like scales (bristles) may be erect or lie more or less flat against the surface. Whether the **bristles are erect or flat is an important feature**, but there are pitfalls that **can confuse** you until you are familiar with some of the species.



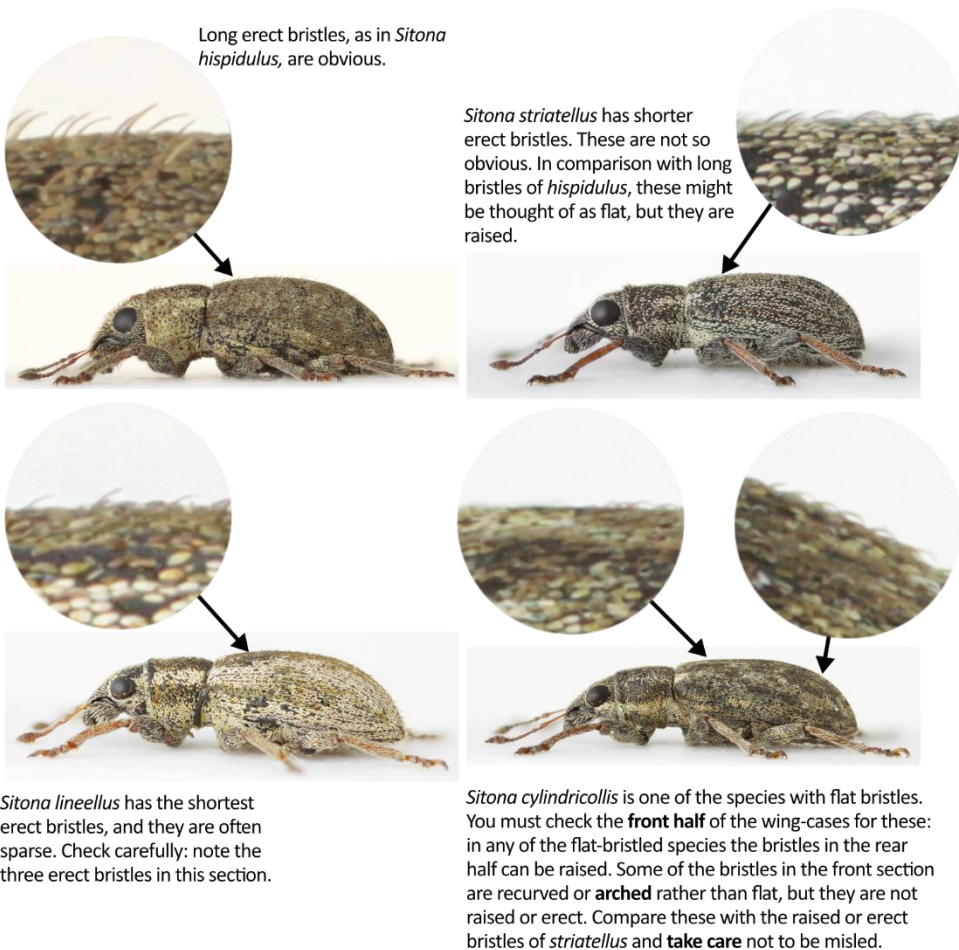
Some species have long erect bristles that are easy to see in the field with a hand lens. Other species have **shorter erect bristles**, which may be visible only under a microscope. If you compare a long-bristled species with a short-bristled one, you might conclude that you have one species with erect bristles, and one with flat bristles.

Most of the flat-bristled species have flat bristles in the **front half** of the wing-cases. The **bristles in the rear half are often erect**. This is particularly so in the very common *Sitona lineatus*. You must look at the front half of the wing-cases to see whether the bristles are flat or erect.

Bristles in the **flat-bristled species may be arched**: they are raised in the middle, but they curve back down so the tip is touching or almost touching the surface. Even though they are not strictly flat against the surface, they do **not** count as erect or raised. This may sound like a subtle and arbitrary distinction; it is, but there are usually always **other features you can use instead**, so do not worry if at first it is confusing.



When looking to see whether bristles are erect or flat, always check the front half of the wing-cases, from the side.



The species of *Sitona* and *Andrion* are listed below in approximate order of bristliness, with a side view of the front part of the wing-cases. The flat-bristled species with the most obviously arched bristles are *Sitona lineatus* and perhaps *cylindricollis*, *obsoletus*, and

puncticollis. These are the most likely to cause confusion; *humeralis*, *lateralis*, *suturalis*, and *sulcifrons* are usually obviously flat. *Sitona gemellatus* has obviously flat scales.

Species with erect bristles

Andrion regensteinese



Sitona macularius



Sitona hispidulus



Sitona striatellus and *ambiguus*



Sitona waterhousei



Sitona lineellus



Species with flat bristles

Sitona lineatus



Sitona puncticollis



Sitona suturalis



Sitona cylindricollis



Sitona humeralis



Sitona sulcifrons



Sitona obsoletus



Sitona lateralis



And *Sitona gemellatus*, which is distinctive because it has no flat round or oval scales. *Coelositona* have flat scales.

Eyes and head shape

The shape of the eyes is most useful, especially if you have a specimen that has lost its scales. *Sitona* can be divided into three groups based on eye shape: rather flat eyes; moderately rounded eyes; rounded or bulging eyes. As with many characters, it is more of a continuum than a clear distinction, but fortunately, the two groups with rounder eyes are also separated by bristles: those with **moderately rounded eyes have flat bristles**; those with more rounded or **bulging eyes have erect bristles**. *Coelositona*, *Sitona gemellatus*, and *Charagmus* have rounded eyes too, but they are distinctive in other ways (longer rostrums, ridges on rostrum, or no broad scales on top of wing-cases). *Andrion regensteinese* has rounded eyes but is distinctive in its body shape and long bristles.

Eye shape will often immediately narrow your choices to one or two species. Check the accounts of those species for differences between them. Eye shape can vary a little (compare the two *suturalis* illustrated below), but it is one of the best characters because it is easy to see. If you are using photos for identification or preparing specimens, make sure the head is in a good position to show the shape of the eyes: specimens with heads tilted to one side are hard to evaluate.



Sitona humeralis has a distinctive head shape, with each side of the top of the head sloping in to a cavity down the rostrum.



Sitona hispidulus is easily recognised by the long bristles and almost flat eyes.

Sitona arranged in approximate order of increasingly rounded eyes, followed by *Charagmus* and *Coelositona*.

Eyes rather flat

Sitona suturalis



Sitona lateralis



Sitona hispidulus



Sitona humeralis



Sitona suturalis



Eyes moderately rounded; bristles flat

Sitona puncticollis



Sitona obsoletus



Sitona lineatus



Sitona sulcifrons



Sitona cylindricollis



Eyes rounded or bulging; bristles erect (see also *Andrion regensteinense*)

Sitona lineellus



Sitona ambiguus



Sitona striatellus



Sitona macularius



Sitona waterhousei



**Eyes rounded;
rostrum long,
ridged**

Charagmus griseus



Eyes rounded; no broad flat scales on top of wing-cases

Coelositona cinerascens



Sitona gemellatus



Coelositona cambricus



Coelositona puberulus



A key to the main groups

Species accounts are arranged in these groups.

- 1 Top of wing-cases with **flat narrow hair-like scales only**; broad scales absent, or only on sides of wing-cases and body (not visible from directly above)..... **2**
Top and sides of wing-cases with **broad flat round to narrow oval scales**. Hair-like scales present too, flat or erect. **3**
- 2 All scales narrow and hair-like (may have slightly thicker scales on shoulders). **Very rare**..... *Sitona gemellatus*
Some oval scales on body and sides of wing-cases. *Coelositona*
- 3 Bristles in front half of wing-cases **erect or raised**..... **4**



- Bristles in front half of wing-cases **flat** or almost so. **5**



- 4 **Constricted waist**, wing-cases and pronotum with rounded sides, making **spider-like** shape. Very long bristles. Rounded eyes.
Common on gorse *Ulex* and broom *Cytisus*..... *Andrion regensteinense*
Waist less constricted, wing-cases with **straighter** sides. Bristles long or short. Eyes rounded or flat..... *Sitona* with **erect bristles**:
hispidulus, *waterhousei*, *macularius*, *lineellus*, *striatellus*, *ambiguus*.
- 5 Prominent parallel **ridges** down rostrum. **Tibiae** densely covered with **broad oval scales**. **Odd** intervals raised into **low ridges**. Scales on scutellum point up and out to sides, like a **pompom**. Body and wing-cases densely scaled, appearing velvety. 4.5-8.5 mm.
..... *Charagmus*
Rostrum without ridges. **Tibiae** with **hair-like scales or bristles**, no or very few broad flat scales. Intervals more or less **flat**, not raised as ridges. Scales on scutellum point backwards. 2.5-6.0 mm.
..... *Sitona* with **flat bristles**: *lineatus*, *cylindricollis*, *humeralis*, *obsoletus*, *puncticollis*, *sulcifrons*, *suturalis*, *lateralis*.

Some distinctive features

Long bristles, eyes almost flat: *Sitona hispidulus*.

Long bristles, eyes rounded, spider-like shape, common on Gorse and Broom: *Andrion regensteinense*.

Three pale dots down either side of the pronotum: *Sitona obsoletus*, *puncticollis*.




***Sitona lineatus* is the most commonly recorded weevil.** It is abundant and ubiquitous. The weevil recording scheme database has more than three times as many records of this species than the next commonest *Sitona* (*obsoletus*). You are likely to find it every time you go looking for weevils south of the Highlands, so it is an important species to learn. The combination of **clear regular stripes** down the wing-cases, **moderately rounded eyes**, long, **rather straight-sided wing-cases**, and a **pronotum usually widest in the rear half** are its signature characters. Even worn specimens that have lost their scales often still have the *lineatus* look. Unless you are beating gorse or broom, it is a good starting point to assume that what you have found is *lineatus* and then either confirm this, or eliminate it and move on to consider other species.









Sitona lineatus in four guises.




In the quick guide and main accounts asterisks indicate rarity of native species in Britain: * Scarce B (found in 31-100 10 km squares); ** Scarce A (found in 16-30 10 km squares); *** Rare (found in 1-15 10 km squares).




Quick guide to *Sitona* and relatives. Images to scale.




	<i>Charagmus griseus</i>	<i>Coelositona cambricus</i>	<i>Coelositona cinerascens</i> ***
			
<i>Size</i>	4.5-8.5 mm	4.1-5.4 mm	4.1-5.4 mm
<i>Broad scales</i>	Round.	Sides of wing-cases and body only.	Sides of wing-cases and body only.
<i>Bristles</i>	Short, flat to recurved.	None.	None.
<i>Eyes</i>	Rounded.	Rounded.	Rounded.
<i>Legs</i>	Dark, but densely scaled .	Dark.	Dark.
<i>Other features</i>	Odd intervals raised into low ridges . Scales on scutellum pointing up and out to sides, like a pompom . Prominent parallel ridges down rostrum.	Pronotum bulging around middle but strongly constricted at rear , as though wearing a tight belt.	Pronotum bulging around middle but strongly constricted at rear , as though wearing a tight belt.



	<i>Coelositona puberulus</i> ***	<i>Sitona gemellatus</i> ***	<i>Andrion regensteinense</i>
			
<i>Size</i>	4.0-5.5 mm	4.0-5.0 mm	3.0-6.0 mm
<i>Broad scales</i>	Sides of wing-cases and body only.	None .	Oval.
<i>Bristles</i>	None.	None.	Very long, erect .
<i>Eyes</i>	Rounded.	Rounded.	Rounded.
<i>Legs</i>	Dark.	Dark brown.	Pale brown.
<i>Other features</i>	Pronotum bulging around middle.	The only species with no broad flat scales on wing-cases or body.	Strongly constricted waist , long front legs .

	<i>Sitona hispidulus</i>	<i>Sitona waterhousei</i> *	<i>Sitona macularius</i> ***
			
<i>Size</i>	2.8-4.6 mm	3.5-4.8 mm	3.0-4.9 mm
<i>Broad scales</i>	Round.	Narrow oval.	Round to oval.
<i>Bristles</i>	Very long , erect.	Medium , erect but curved. Some white on odd intervals.	Medium , erect but curved. Some white on odd intervals.
<i>Eyes</i>	Almost flat.	Very rounded , almost on stalks.	Rounded.
<i>Legs</i>	Pale brown.	Pale brown.	Pale brown.
<i>Other features</i>	The only species with very long bristles, and almost flat eyes.	Wide head from bulging eyes . Odd intervals slightly raised into low ridges . Wing-cases mottled from small patches without broad flat scales.	Wing-cases mottled from small patches without broad flat scales.

	<i>Sitona lineellus</i>	<i>Sitona striatellus</i>	<i>Sitona ambiguus</i> *
			
<i>Size</i>	2.6-3.7 mm	2.8-4.7 mm	2.6-3.8 mm
<i>Broad scales</i>	Round to oval.	Round to oval.	Round to oval.
<i>Bristles</i>	Short , erect but curved.	Short , erect but curved.	Short , erect but curved.
<i>Eyes</i>	Rounded.	Rounded.	Rounded.
<i>Legs</i>	Pale brown.	Pale brown.	Pale brown.
<i>Other features</i>	Small . Brown or grey, not metallic. Often darker in centre of wing-cases, with broken stripes down sides.	Broad scales metallic pink, blue, green, or pearl, sometimes with brownish stripes. Usually striped or uniformly metallic.	Very like <i>striatellus</i> .

	<i>Sitona lineatus</i>	<i>Sitona cylindricollis</i>	<i>Sitona humeralis</i>
			
<i>Size</i>	3.4-5.3 mm	3.6-5.0 mm	3.5-5.1 mm
<i>Broad scales</i>	Round to oval.	Round to oval.	Round to oval.
<i>Bristles</i>	Short, almost flat in front half, slightly raised at rear.	Short, almost flat in front half, flat to slightly recurved at rear.	Short, almost flat in front half, flat to slightly recurved at rear.
<i>Eyes</i>	Rounded.	Rounded	Slightly rounded.
<i>Legs</i>	Pale brown.	Pale brown.	Pale brown.
<i>Other features</i>	Clear narrow stripes down wing-cases. Wing-cases with almost straight sides .	Mottled wing-cases, usually with paler shoulders. Head narrower than in <i>lineatus</i> .	Centre of wing-cases usually dark . Head slopes inwards between eyes.

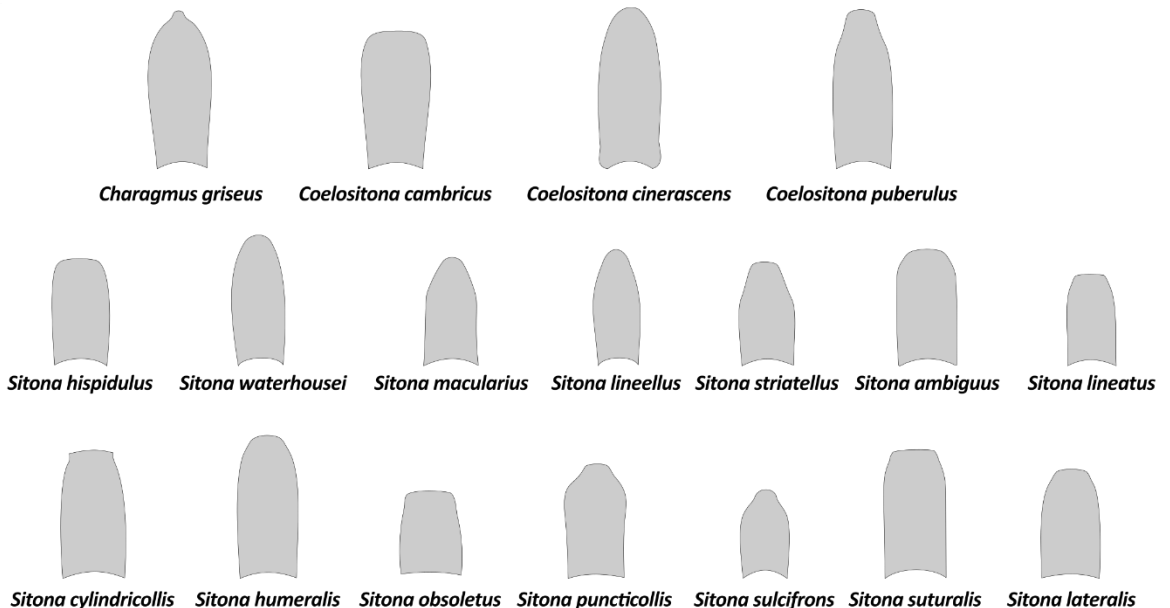
	<i>Sitona obsoletus</i>	<i>Sitona puncticollis</i> *	<i>Sitona sulcifrons</i>
			
<i>Size</i>	4.3-5.7 mm	4.7-6.0 mm	2.6-3.9 mm
<i>Broad scales</i>	Narrow oval.	Narrow oval	Narrow to oval.
<i>Bristles</i>	Short, almost flat in front half, flat to slightly recurved at rear.	Short, almost flat in front half, flat to slightly recurved at rear.	Short, almost flat.
<i>Eyes</i>	Rounded.	Rounded.	Rounded.
<i>Legs</i>	Pale brown.	Pale brown.	Pale brown.
<i>Other features</i>	Often a rich, warm cinnamon brown , with three pale dots down either side of the centre of the pronotum.	Has large pin-prick hole between eyes, rostrum groove stops at middle of eyes.	Small. Sparsely scaled.

	<i>Sitona suturalis</i>	<i>Sitona lateralis</i> ***
		
<i>Size</i>	3.3-4.5 mm	3.2-4.5 mm
<i>Broad scales</i>	Oval	Oval
<i>Bristles</i>	Short, almost flat.	Short, almost flat.
<i>Eyes</i>	Almost flat to moderately rounded	Almost flat.
<i>Legs</i>	Pale brown.	Pale brown.
<i>Other features</i>	Scales in first interval slightly wider and denser and metallic and paler, so has contrastingly pale stripe down suture pale.	Very like suturalis, but not metallic, and wing-cases usually mottled.

The main species accounts have at least one picture of the whole weevil. This is accompanied by insets showing one or more of the tip of the wing-cases, the side of the wing-cases between the mid and hind legs, and the front of the wing-cases in side view. **For better views of the scales, see the full size original photos of the species, which are in the broadnoses album at tinyurl.com/weevilalbums.** In the album you will also find side views of many of the species.

Maps show distribution in Britain in 50 km squares. ○ Last recorded before 1930. ● Last recorded before 1970. ● Last recorded before 2000. ● Recorded since 2000. The maps are only as good as the records. You can help improve them by submitting your records to [iRecord](#). If you can support your record with good photos, this will help verify it. Try to get **one photo from directly above, and one from the side to show the bristles**. The species accounts tell you which features are important for identification of each species: these are the features that need to be visible in your photos.

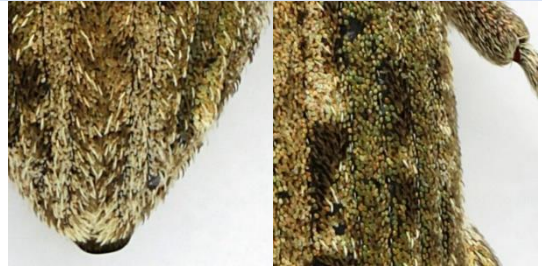
Thanks to Peter Hodge and James McGill for the loan of some of the specimens illustrated here. The research for this guide was done mostly in the Insect Room at the Cambridge University Museum of Zoology, and in the Angela Marmont Centre for UK Biodiversity. Thanks to the staff at Cambridge and at the Natural History Museum for allowing me such free access to their superb collections.



Middle lobe of the aedeaguses of male Sitonas.

Charagmus griseus

griseus = grey



Size	4.5-8.5 mm
Broad flat scales on wing-cases	Round.
Bristles	Short, flat to recurved.
Eyes	Rounded.
Legs	Dark, but densely scaled .
Other features	Odd intervals raised into low ridges . Scales on scutellum pointing up and out to sides, like a pompom . Prominent parallel ridges down rostrum.

A large and attractive species, with dense scales creating a **velvet** appearance. Narrow, **tapering rear**, more pointed than other sitonas. Two prominent **parallel ridges** down the **rostrum**, sharper and more obvious than those in *Coelositona*. **Tibiae** covered with **flat oval scales**. The pompom of scales on the scutellum is unique to *Charagmus*.

Various legumes, from Bird's-foot *Ornithopus perpusillus* to Broom *Cytisus scoparius*. Mostly coastal or on sand inland.

Compare: *Sitona* (less tapering rear, shorter and less tapering rostrum, scales on scutellum flat and pointing backwards, rostrum without prominent ridges, tibiae with hair-like scales only or only a few oval scales). *Coelositona* (scales on top of wing-cases narrow and hair-like not round, pronotum bulging at rear, tibiae with hair-like scales only). *Tanymecus palliatus* (bristles on cheeks, longer antennae, no pompom of scales on scutellum, no velvet appearance).



Charagmus gressorius

gressorius = striding



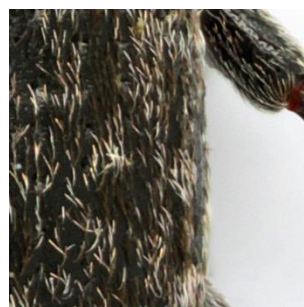
<i>Size</i>	7.0-9.0 mm
<i>Broad flat scales on wing-cases</i>	Round.
<i>Bristles</i>	Short, flat to recurved.
<i>Eyes</i>	Rounded.
<i>Legs</i>	Dark, but densely scaled .
<i>Other features</i>	Odd intervals raised into low ridges . Scales on scutellum pointing up and out to sides, like a pompom . Prominent parallel ridges down rostrum.

Another large and attractive species, similar to *Charagmus griseus*. Differs from other species by the same features as *griseus*. Distinguished from *griseus* by the **cleaner white stripe** down the pronotum, and even longer rostrum.

On lupins *Lupinus*. Not native. So far found only in Devon. Should be looked for elsewhere.

Compare: *Sitona* (less tapering rear, shorter and less tapering rostrum, scales on scutellum flat and pointing backwards, rostrum without prominent ridges, tibiae with hair-like scales only or only a few oval scales). *Coelositona* (scales on top of wing-cases narrow and hair-like not round, pronotum bulging at rear, tibiae with hair-like scales only). *Tanymecus palliatus* (bristles on cheeks, longer antennae, no pompom of scales on scutellum, no velvet appearance).



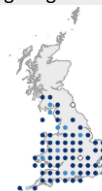


<i>Size</i>	4.1-5.4 mm
<i>Broad flat scales on wing-cases</i>	Only on lower sides and extreme front of wing-cases. (Scales on top all hair-like.)
<i>Bristles on wing-cases</i>	None.
<i>Eyes</i>	Rounded.
<i>Legs</i>	Dark.
<i>Other features</i>	Pronotum bulging around middle but strongly constricted at rear , as though wearing a tight belt.

The only **common** *Coelositona*. Appears **dark**, from blackish legs and surface showing through the hair-scales. Scape usually **dark** brown or blackish. Rostrum weakly hippo-nose shape: slightly widened underneath the antenna sockets, slightly pinched in around the middle, an effect that is enhanced by two **faint ridges** that **converge** at the pit between the eyes. Rostrum slightly **caved in** down the middle.

Associated with Greater Bird's-foot-trefoil *Lotus uliginosus*, but occasionally on Common Bird's-foot-trefoil *Lotus corniculatus*.

Compare: *Sitona* (pale brown legs, many round or oval scales on wing-cases, most have shorter rostrum, pronotum less bulging and without belt at rear). *Charagmus* (many round scales on wing-cases, less bulging pronotum). *Coelositona cinerascens* and *pubescens* (see those species accounts). *Tanymecus palliatus* (bristles on cheeks, longer antennae, pronotum widest at or in front of middle, flatter eyes).





<i>Size</i>	4.3-5.9 mm
<i>Broad flat scales on wing-cases</i>	Only on lower sides and extreme front of wing-cases. (Scales on top all hair-like.)
<i>Bristles on wing-cases</i>	None.
<i>Eyes</i>	Rounded.
<i>Legs</i>	Dark.
<i>Other features</i>	Pronotum bulging around middle.

Similar to the much more common *cambricus*, but rostrum is **flatter** above (no ridges converging on the pit, more or less flat on top), more tapering towards the front, not expanded. Scape **red-brown** (usually dark in *cambricus*, but *cambricus* rarely can have a red-brown scape).

Rare. On Narrow-leaved Bird's-foot-trefoil *Lotus tenuis* in south-east England, favours brownfield sites.

Compare: *Sitona* (pale brown legs, many round or oval scales on wing-cases, most have shorter rostrum, pronotum less bulging and without belt at rear). *Charagmus* (many round scales on wing-cases, less bulging pronotum). *Coelositona puberulus* (see that species). *Tanymecus palliatus* (bristles on cheeks, longer antennae, pronotum widest at or in front of middle, flatter eyes).



*Coelositona puberulus****

puberulus = slightly hairy



<i>Size</i>	4.0-5.5 mm
<i>Broad flat scales on wing-cases</i>	Only on lower sides and extreme front of wing-cases. (Scales on top all hair-like.)
<i>Bristles on wing-cases</i>	None.
<i>Eyes</i>	Rounded.
<i>Legs</i>	Dark.
<i>Other features</i>	Pronotum bulging around middle.

Similar to the much more common *cambricus*, but scape **red-brown** (usually dark in *cambricus*), and keels on rostrum are not so obvious and do not reach as far back towards the pit on the forehead. Rostrum not quite as expanded at tip as in *cambricus*. Also similar to *cinerascens*, but centre of rostrum **depressed** down the middle in front of the eyes, and the **eyes** are more **rounded**.


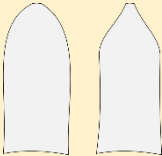

Widespread but scattered and **rare**. On bird's-foot-trefoils *Lotus*. There is no clear pattern or reason for its scattered distribution. It may still be overlooked among the much commoner *cambricus*.

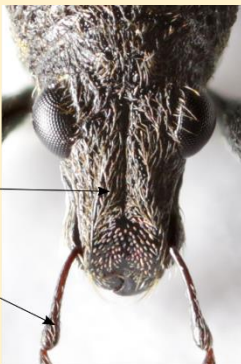
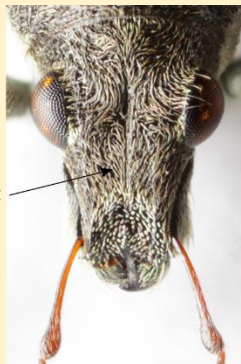

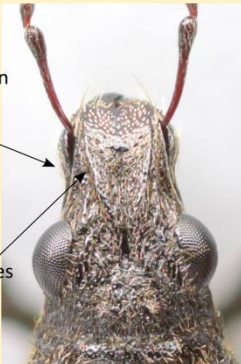
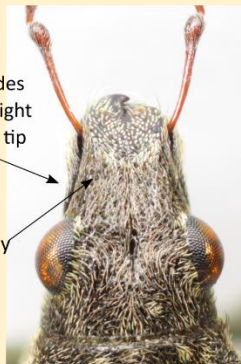
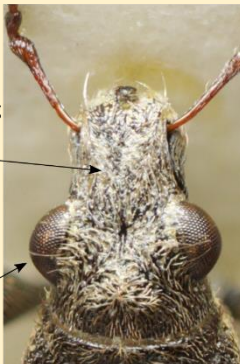
Compare: *Sitona* (pale brown legs, many round or oval scales on wing-cases, most have shorter rostrum, pronotum less bulging and without belt at rear). *Charagmus* (many round scales on wing-cases, less bulging pronotum). *Tanymecus palliatus* (bristles on cheeks, longer antennae, pronotum widest at or in front of middle, flatter eyes).



Coelositona

The three *Coelositona* species are easily recognised as a group, but they are not so easy to separate from each other. You need to look at the head and rostrum closely and under good light. The characters are somewhat variable and not easy to appreciate except in direct comparison. You are most likely to come across *cambricus* before either of the other two species (unless you are on a site with lots of Narrow-leaved Bird's-foot-trefoil *Lotus glaber*, in which case check carefully for *cinerascens*). The shape of the aedeagus is the easiest and most reliable feature, and may be needed to confirm the identification of some of the more difficult individuals. The illustrated specimen of *puberulus*, for example, seems from some angles to have convergent ridges on the rostrum, however, the keels do not continue to the forehead pit, and they are less prominent. The aedeagus of this specimen confirms its identification as *puberulus*.

	<i>cambricus</i>	<i>cinerascens</i>	<i>puberulus</i>
<i>Scape</i>	Usually dark brown to blackish, but may be red-brown.	Red-brown	Red-brown
<i>Ridges on rostrum</i>	More prominent, converging on forehead pit .	Faint , hardly apparent, more or less parallel.	Less prominent, parallel or slightly converging, but not reaching forehead pit .
<i>Centre of rostrum</i>	Caved in.	More or less flat .	Caved in.
<i>Sides of rostrum</i>	Swollen towards tip : arching out around antenna sockets.	More or less straight, tapering to tip.	More or less straight or very slightly swollen around tip.
<i>Aedeagus</i>	 Blunt, square tip	 Rounded or pointed tip	 Narrowed before a broad square tip
<i>Eyes</i>	Less rounded.	Less rounded.	More rounded.

<p>Centre of rostrum caved in</p> <p>Darker scape</p>		<p>Centre of rostrum almost flat</p>		<p>Centre of rostrum caved in</p>	
<p>Rostrum swollen at end, pinched in at middle</p> <p>Prominent ridges converging on pit in forehead</p>		<p>Rostrum sides almost straight tapering to tip</p> <p>Ridges hardly apparent</p>		<p>Ridges ending well before forehead pit</p> <p>Eyes more rounded, wider</p>	

Heads lit from side (top row) and diffusely from in front (bottom row).

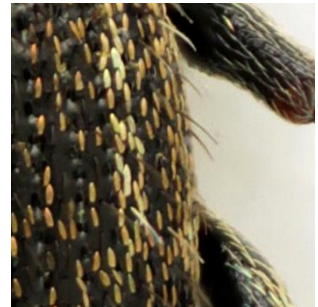


Size	4.0-5.0 mm
Broad flat scales on wing-cases	None. (Flat scales hair-like, with just a few very narrow scales at the shoulders.)
Bristles on wing-cases	None.
Eyes	Rounded.
Legs	Dark brown.
Other features	
No oval or round scales , so more like <i>Coelositona</i> than other <i>Sitona</i> species. Hair-like scales short and flat , no rows of longer hairs or bristles on wing-cases.	
Very rare. On various legumes on eroding coastal cliffs.	
Compare: Other <i>Sitona</i> (legs and antennae paler brown, round or oval scales on wing-cases). <i>Coelositona</i> (pronotum more rounded and bulging at sides, some oval scales on lower sides of wing-cases).	



Andrion regensteinense

regensteinense = from Regenstein, a medieval castle in Germany

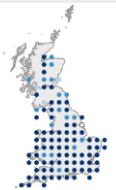


Size	3.0-6.0 mm
Broad flat scales on wing-cases	Oval.
Bristles on wing-cases	Very long , erect.
Eyes	Rounded.
Legs	Pale brown.
Other features	Strongly constricted waist, long legs.

Longer bristles than any *Sitona* apart from *hispidulus*. The shape is distinctive too, with a **narrower waist** and more rounded shoulders than *Sitona*. In side view, the pronotum and wing-cases meet in a **cleft** (rather than the flat-backed appearance of *Sitona*). Together with the **long front legs**, this gives it a more spider-like shape.

Very common on gorses *Ulex* and Broom *Cytisus scoparius*.

Compare: *Sitona hispidulus* (flatter eyes, shorter legs, less constricted waist). *Sitona lineatus* (less constricted waist, rounded eyes, bristles shorter and mostly flat, slightly erect only at rear of wing-cases). Other *Sitona* (shorter bristles, shorter legs, less constricted waist). *Coelositona* (shorter legs, no erect bristles, no oval scales).



Andrion. Pronotum and wing-cases meet in deeper cleft. More spider-like profile, with more rounded front and rear.



Sitona. Pronotum and wing-cases join more smoothly, with a flatter profile and not such a deep gap.

Sitona hispidulus

hispidulus = slightly shaggy



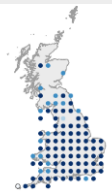
Size	2.8-4.6 mm
Broad flat scales on wing-cases	Round.
Bristles on wing-cases	Very long, erect.
Eyes	Almost flat.
Legs	Pale brown.

Other features

Long bristles and **flat eyes** are unique. *Sitona suturalis*, *onondis*, and *humeralis* have flat eyes, but shorter bristles that are flat or recurved. Other bristly *Sitona* have more rounded eyes and shorter bristles.

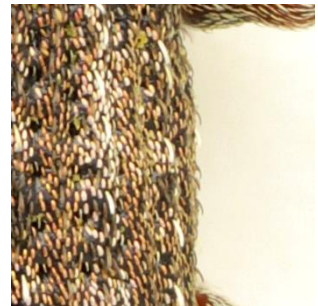
Common. On various legumes, especially clovers *Trifolium*.

Compare: No other *Sitona* has flat eyes and such long bristles. *Andrion regensteinense* (round eyes, longer legs, narrower waist). *Sitona lineatus* (rounded eyes, bristles shorter and mostly flat, slightly erect only at rear of wing-cases).



*Sitona waterhousei**

waterhousei, after one of the Waterhouses, a family of English entomologists

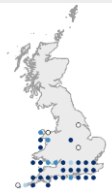


<i>Size</i>	3.5-4.8 mm
<i>Broad flat scales on wing-cases</i>	Narrow oval.
<i>Bristles on wing-cases</i>	Medium , erect but curved. Some white on odd intervals.
<i>Eyes</i>	Very rounded, almost on stalks.
<i>Legs</i>	Pale brown.
<i>Other features</i>	Wide head from bulging eyes. Odd intervals slightly raised into low ridges . Wing-cases mottled from small patches without broad flat scales.

Has the most **rounded and sticking out eyes** of any *Sitona*, and a **depression on the forehead** between them: head shape alone identifies this species. *Sitona macularis* has similar hair-scales, but it has normal eyes and the odd intervals are not more raised than the others. *Charagmus griseus* is the only other sitona with raised odd intervals.

Widespread in the south. On Bird's-foot-trefoil *Lotus corniculatus*.

Compare: No other *Sitona* has such bulging eyes. *Sitona lineatus* (eyes less rounded, forehead not caved in, shorter bristles, bristles lying flat in front half of wing-cases).



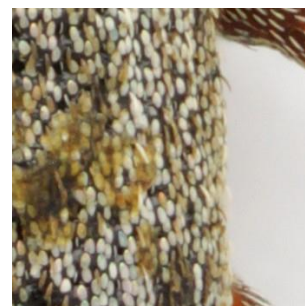
*Sitona macularius****

macularius = spotted, marked



<i>Size</i>	3.0-4.9 mm
<i>Broad flat scales on wing-cases</i>	Round to oval.
<i>Bristles on wing-cases</i>	Medium , erect but curved. Some white on odd intervals.
<i>Eyes</i>	Rounded.
<i>Legs</i>	Pale brown.
<i>Other features</i>	Wing-cases mottled from small patches without broad flat scales.
Very like <i>lineellus</i> , but bristles longer (on wing-cases and pronotum). Head slightly more depressed between eyes, but this is subtle.	
Scattered. Now rare, with few recent records. On various legumes.	
Compare: <i>Sitona striatellus</i> and <i>ambiguus</i> (see below). <i>Sitona waterhousei</i> (wider, more rounded eyes, odd intervals slightly raised). <i>Sitona lineatus</i> (bristles shorter and mostly flat, slightly erect only at rear of wing-cases, wing-cases with straighter sides, neater stripes). Other <i>Sitona</i> have shorter bristles.	





<i>Size</i>	2.6-3.7 mm
<i>Broad flat scales on wing-cases</i>	Round to oval.
<i>Bristles on wing-cases</i>	Short , erect but curved.
<i>Eyes</i>	Rounded.
<i>Legs</i>	Pale brown.

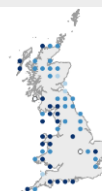
Other features

Commonest pattern is dark patch in middle of wing-cases with messy stripes on either side, sometimes mottled with dark patches. Most similar to *striatellus* and *ambiguus* (see below).

Most frequent in the north and west, especially by the coast. Mostly on low-growing legumes.

Compare: *Sitona macularius* (longer bristles). *Sitona waterhousei* (wider, more rounded eyes, odd intervals slightly raised). *Sitona lineatus* (larger, bristles mostly flat, slightly erect only at rear of wing-cases, wing-cases with straighter sides, neater stripes).

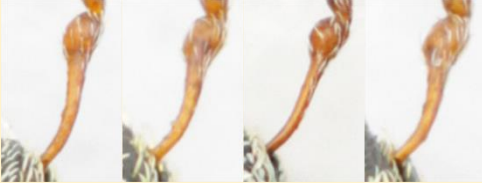





Known as *Sitona decipiens* in some older books. Note that when this species was called *decipiens*, the name *Sitona lineellus* was used for *Sitona ambiguus*. This is the case in Kevan's 1959 paper on *Sitona*.



Sitona macularius and *lineellus* v *Sitona striatellus* and *ambiguus*

Sitona macularius should be easily recognised by its longer bristles, but otherwise these two groups are not always easy to tell apart. All the differences are subtle. The shape of the scape is consistent, but it is particularly subtle. The other differences are variable. No one is diagnostic, but in combination they are useful, especially if you are not sure about the shape of the scape. All of them are more easily appreciated if you have a series of specimens of each species to compare side by side.

As a rough guide, if you have found a weevil from this group on Gorse or Broom, assume it is *striatellus* unless proven otherwise; if it is metallic and from clovers, vetches, or other low-growing legumes, try *ambiguus*; and if it looks grey or brown and is from the coast see whether it fits with *lineellus*.

	<i>lineellus/macularius</i>	<i>striatellus/ambiguus</i>
Scape	More abruptly expanded into shorter and wider club at tip.	More gradually narrowed from narrower club at tip.
		
Pits and scales on pronotum and head	Pits shorter , with wider spaces between, the spaces with more frequent pin-pricks . (More obvious in some than in others, and often obscured by scales.) Scales shorter and blunter .	Pits longer , with narrower, smoother spaces between. Scales longer and more pointed .
		
Wing-cases	Densely scaled , largely covering the surface. Appears brownish or grey-brown . Darker scales brown or pearl, lighter scales paler brown or metallic. <i>Sitona lineellus</i> usually has large dark patch in centre , with messy paler stripes on either side; sometimes mottled. <i>Sitona macularius</i> is usually mottled .	More sparsely scaled , black surface more visible. Metallic pink, blue, green, or pearl , sometimes with brownish stripes. Does not usually appear brown; if it does, it still looks more metallic. Uniformly metallic , or neat stripes on alternate intervals. (May be mottled where scales have worn off.)
		
Habitat	Low-growing legumes.	<i>Sitona striatellus</i> on Gorse Ulex or Broom Cytisus . <i>Sitona ambiguus</i> on low-growing legumes.

Sitona ambiguus and *Sitona striatellus*

Sitona ambiguus



Scales on forehead slightly **shorter**.

Sitona striatellus



Scales on forehead **longer**. Note especially that the brown bristles are longer than in *ambiguus*.



Eyes slightly more **oval**, with **flatter** top and bottom edges.



Eyes more **circular**, top and bottom edges **rounded**, not flattened.



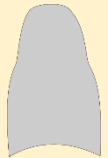
Spermatheca with no wart, or only a smaller wart on the round part.



Aedeagus.



Spermatheca with a larger wart on the round part.



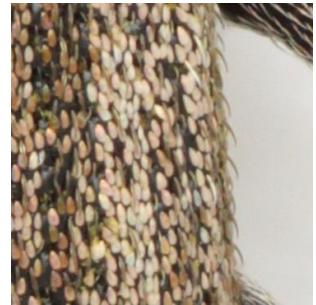
Aedeagus.

Colour variation in *Sitona striatellus*



Sitona striatellus

striatellus = faintly channelled or striped



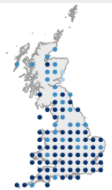
Size	2.8-4.7 mm
Broad flat scales on wing-cases	Round to oval.
Bristles on wing-cases	Short , erect but curved.
Eyes	Rounded.
Legs	Pale brown.

Other features

Usually looks sequined with variable pastel but metallic colours: pink, blue, green, or pearl. The black surface often shows through between the scales.

Common on Gorse *Ulex* and Broom *Cytisus scoparius*.

Compare: *Sitona macularius* (longer bristles). *Sitona lineellus* (see above). *Sitona lineatus* (brownier, bristles mostly flat, slightly erect only at rear of wing-cases, wing-cases with straighter sides, often longer). *Sitona ambiguus* (see above and below).



*Sitona ambiguus**

ambígúus = uncertain



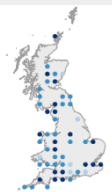
<i>Size</i>	2.6-3.8 mm
<i>Broad flat scales on wing-cases</i>	Round to oval.
<i>Bristles on wing-cases</i>	Short , erect but curved.
<i>Eyes</i>	Rounded.
<i>Legs</i>	Pale brown.

Other features

Very like *striatellus*, but associated with vetches and other low-growing legumes. Eyes slightly more oval in side view, with **flatter top and bottom edges**. Round scales and hair-scales on forehead **slightly shorter** than in *striatellus*, not overtopping the rim of the eyes so much: has shorter eyelashes. Pronotum slightly straighter at sides at base and not so constricted, but this is even more subtle and variable than the other differences. If you want to be sure, look at the aedeagus (blunt, flat tip in *striatellus*; longer, drawn out tip in *ambiguus*). The spermatheca may also be different but I have not seen enough to know whether the difference is constant.

On vetches and other low-growing legumes. Widespread but local. Might be overlooked among other *Sitona*.

Compare: *Sitona macularius* (longer bristles). *Sitona lineellus* (see above). *Sitona lineatus* (brownier, bristles mostly flat, slightly erect only at rear of wing-cases, wing-cases with straighter sides, often longer).



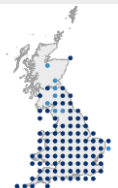
Sitona lineatus

linéatus = lined



Size	3.4-5.3 mm
Broad flat scales on wing-cases	Round to oval.
Bristles on wing-cases	Short, almost flat in front half, slightly raised at rear.
Eyes	Rounded.
Legs	Pale brown.
Other features	Usually has clear narrow stripes down wing-cases.

The **common** *Sitona* in most of Britain: rule out *lineatus* before you consider any of the other species. Only *lineatus* has **all** of these features: **clear stripes** down the wing-cases; a dense covering of round, **short oval** flat scales; moderately **rounded eyes**; and short bristles lying **flat** in the front half of the wing-cases. Problems occur with worn specimens of this and other species, so use as many characters as you can to make your identification. Be particularly aware that the erect bristles of *striatellus* etc are not easy to see unless you know what to look for, and they can wear off. Also, *lineatus* can lose its stripes and look plain, the stripes can become mottled if patches of scales wear off, and although the bristles of *lineatus* are more or less flat or recurved in the front half of the wing-cases, they are slightly raised in the rear half.



On almost any legumes in almost any place in the lowlands. Rarer in the uplands and the north. Often found on other plants (not legumes) including trees and shrubs.

Compare: Other *Sitona* (see each species for distinguishing characters). *Coelositona* (flat round scales only on sides of wing-cases and body, wing-cases not regularly striped).

Sitona cylindricollis

cylindricollis = cylinder-neck

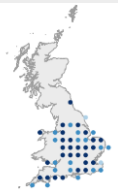


Size	3.6-5.0 mm
Broad flat scales on wing-cases	Round to oval.
Bristles on wing-cases	Short, almost flat in front half, flat to slightly recurved at rear.
Eyes	Rounded
Legs	Pale brown.
Other features	Mottled wing-cases, usually with paler shoulders.

Often greyish, but can be brown. **Mottled** wing-cases, lacking clear stripes. **Eyes rounded**, slightly **smaller and flatter than in lineatus**, and **oval** in side view, with slightly flattened on top and bottom edges (almost circular in side view in *lineatus*). **Head** proportionately **smaller** and narrower than in *lineatus*, and pronotum usually with slightly less rounded sides, widest at the middle rather than in the rear half (but there may be some overlap between the two in pronotum shape). The fine groove on down the head reaches further back than in *lineatus*, but this is not easy to see, and its appearance changes with the angle of the head.

On melilots *Melilotus* in open places. Widespread in the south.

Compare: *Sitona obsoletus* and *puncticollis* (usually richer brown, flat scales narrower, head proportionately larger, often three pale dots on each side of the middle of the pronotum). *Sitona humeralis* (forehead caved in, with a wider groove, slightly wider pronotum, wing-cases often with a large dark patch in the centre). *Sitona suturalis* and *lateralis* (eyes flatter, head wider). *Sitona sulcifrons* (forehead slightly caved in, with a wider groove, eyes with raised rims, wing-cases shorter and more sparsely scaled, scales metallic). Other *Sitona* have longer and more erect bristles in the front half of the wing-cases.



Sitona humeralis

humeralis = of the shoulders, referring to the pale mark on shoulders of wing-cases

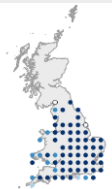


Size	3.5-5.1 mm
Broad flat scales on wing-cases	Round to oval.
Bristles on wing-cases	Short, almost flat in front half, flat to slightly recurved at rear.
Eyes	Slightly rounded.
Legs	Pale brown.
Other features	Centre of wing-cases usually dark, distinctive head shape , conical neck

Centre of wing-cases often dark, with paler shoulder streaks and mottled sides, but can have mottling in the centre too. Top of head **slopes inwards between eyes and down rostrum** so has a wide gutter running down its head. **Rim of eyes raised** above the outline of the head.

On low-growing legumes, especially medicks *Medicago* in grassland and disturbed places. Widespread in the south.

Compare: *Sitona lineatus* (head and rostrum flat on top, eyes more rounded, clear stripes down wing-cases). *Sitona obsoletus* and *puncticollis* (usually richer brown, flat scales narrower, head flat between eyes, often three pale dots on each side of the middle of the pronotum, more rounded eyes). *Sitona cylindricollis* (head flat between eyes, pronotum slightly narrower, wing-cases usually mottled in centre). *Sitona suturalis* and *lateralis* (eyes even more flat, head flat or raised between eyes, some scales metallic). *Sitona sulcifrons* (wing-cases shorter and more sparsely scaled, some scales metallic, eyes more rounded). Other *Sitona* have longer and more erect bristles in the front half of the wing-cases.



Sitona obsoletus

obsolētus = worn out



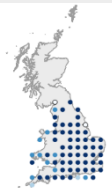
Size	4.3-5.7 mm
Broad flat scales on wing-cases	Narrow oval.
Bristles on wing-cases	Short, almost flat in front half, flat to slightly recurved at rear.
Eyes	Rounded.
Legs	Pale brown.
Other features	Often a rich, warm cinnamon brown, with three pale dots down either side of the centre of the pronotum.

Flat scales **narrower** than most other *Sitona* (except *puncticollis* and *gemellatus*). Wing-cases rather **plain or mottled**, without clean stripes. Usually has three pale dots down each side of the centre of the pronotum, a pattern I have not seen other *Sitona* apart from *puncticollis*, but they can be missing. On average larger than other *Sitona*, but it overlaps in size with most species. The second and third intervals of the wing-cases are slightly wider at the rear, but this is hard to see unless the scales have worn off.

On clovers *Trifolium* in grassland and other open ground. Common in the south.

Compare: *Sitona lineatus* (flat scales broader, clear stripes down wing-cases, pronotum usually widest in rear half, wing-cases with straighter sides, more tapering at rear). *Sitona puncticollis* (see that species). *Sitona cylindricollis* (broader scales, head smaller and narrower, often more greyish, shoulders often paler). *Sitona suturalis* and *lateralis* (eyes flatter, flat scales broader, some flat scales metallic). *Sitona sulcifrons* (wing-cases shorter and more sparsely scaled, some scales metallic, eyes more rounded). Other *Sitona* have longer and more erect bristles in the front half of the wing-cases.

Better known as *Sitona lepidus* almost everywhere, but we have been subjected to a pointless name change. We are told that the rules of nomenclature maintain stability and clarity; what they often do is enforce change and confusion.



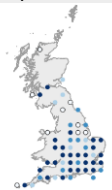
*Sitona puncticollis**

puncticollis = punctured neck



<i>Size</i>	4.7-6.0 mm
<i>Broad flat scales on wing-cases</i>	Narrow oval
<i>Bristles on wing-cases</i>	Short, almost flat in front half, flat to slightly recurved at rear.
<i>Eyes</i>	Slightly rounded.
<i>Legs</i>	Pale brown.
<i>Other features</i>	Has large pin-prick hole between eyes, rostrum groove stops at middle of eyes.

Very like *obsoletus*, and differs from other species by the same features (except that the third interval is not widened at the rear). May be **more contrastingly and strongly patterned**, but I have not seen enough specimens to know how reliable this is. The distinguishing features are the groove down the rostrum, which is **very fine** and **ends at a small pin-prick** like hole **between the eyes**. In *obsoletus* the groove is a little wider and it continues back past the eyes, but this not always easy to see among the scales. Beware that the rostrum groove of *obsoletus* can be widen a little between the eyes, creating a narrow, shallow pit: do not mistake this for the sharply defined round pit of *puncticollis*. The second and third intervals are not widened at the rear.



On clovers *Trifolium* in grasslands and other open places. Widespread but local, and now not often reported.

Compare: *Sitona lineatus* (flat scales broader, clear stripes down wing-cases, pronotum usually widest in rear half, wing-cases with straighter sides, more tapering at rear). *Sitona cylindricollis* (broader scales, head smaller and narrower, often more greyish, shoulders often paler). *Sitona suturalis* and *lateralis* (eyes flatter, flat scales broader, some flat scales metallic). *Sitona sulcifrons* (wing-cases shorter and more sparsely scaled, some scales metallic, eyes more rounded). Other *Sitona* have longer and more erect bristles in the front half of the wing-cases.

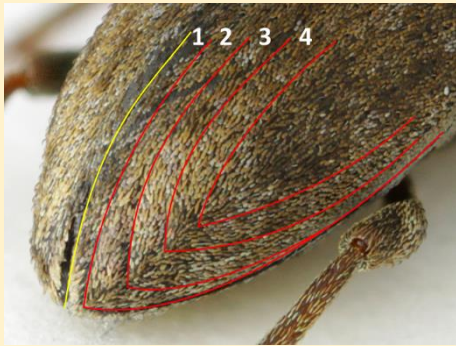
Sitona obsoletus and *Sitona puncticollis*

These two have narrower scales than most other *Sitona*. The features that distinguish them are often hard to see because they are covered by scales, and the apparent length of the groove on the forehead changes according to how far forward the head is tilted. In some cases you might need to look at the aedeagus. In the pictures of the wing-cases, the suture is shown in yellow, the striae are in red, numbers mark the first to fourth or fifth intervals

Sitona obsoletus



Narrow groove down rostrum extends to rear of eyes.



Second and third intervals widened towards the tip.



Aedeagus with broad blunt tip.

Sitona puncticollis



Faint groove down rostrum ends at front of eyes, in a small pin-prick pit.



Second and third intervals not widened towards tip.



Aedeagus with narrowed tip.

Sitona sulcifrons

sulcifrons = furrow on forehead

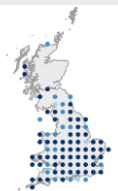


Size	2.6-3.9 mm
Broad flat scales on wing-cases	Narrow to oval.
Bristles on wing-cases	Short, almost flat.
Eyes	Rounded.
Legs	Pale brown.
Other features	Sparsely scaled.

Small. Flat scales **sparse**, some **metallic**. Appears **dark** because sparsity of scales reveals blackish surface underneath. **Wide groove on forehead** between eyes. Head and rostrum slightly **depressed** (but less so than in *humeralis*), rim of eyes raised above the outline of the head. Worn specimens of other species may look dark, so check shape and structure.

On clovers *Trifolium* in grasslands and other open places. Widespread and common, except in the far north.

Compare: *Sitona lineatus* (usually larger, head and rostrum flat on top, eyes more rounded, denser scales, clear stripes down wing-cases, wing-cases with straighter sides). *Sitona obsoletus* and *puncticollis* (larger, denser scales, flat scales narrower, head flat between eyes, often three pale dots on each side of the middle of the pronotum, more rounded eyes). *Sitona cylindricollis* (usually larger, head flat between eyes, wing-cases longer and more densely scaled, head narrower). *Sitona suturalis* and *lateralis* (eyes flatter, head flat or raised between eyes, usually more densely scaled). Other *Sitona* have longer and more erect bristles in the front half of the wing-cases.



Sitona suturalis

suturalis = of the seam or suture (has a pale stripe down the suture)



Size	3.3-4.5 mm
Broad flat scales on wing-cases	Oval
Bristles on wing-cases	Short, almost flat.
Eyes	Almost flat to moderately rounded.
Legs	Pale brown.
Other features	Scales in first interval slightly wider and denser and metallic and paler, so has contrastingly pale stripe down suture pale .

Almost flat eyes and flat, short bristles are shared only with the very similar *lateralis*, but eyes can be moderately rounded, and then is less easy to distinguish. *Sitona hispidulus* has similar eyes, but it has long, erect bristles. *Sitona humeralis* has flattish eyes, but they are slightly more rounded than in *suturalis*, and it is easily distinguished by its caved-in head, lack of metallic scales, and (usually) the dark patch in the centre of the wing-cases. **Stripe of metallic pink, blue, or green** scales down **first interval**, and often on third and fifth too. This contrastingly metallic stripe is distinctive, but the scales often wear off. Some of the species with more erect bristles (especially *striatellus* and *ambiguus*) can have this stripe too, but they have more rounded eyes, (as well as more erect bristles)

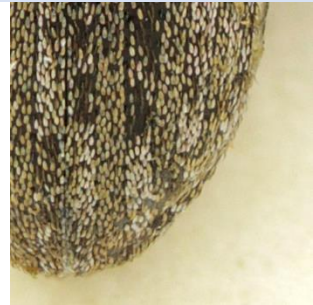


On vetches and vetchlings *Vicia* and *Lathyrus* in grasslands and other open places. Widespread and frequent except in the far north.

Compare: *Sitona lineatus* (often more rounded eyes, clear stripes down wing-cases, pronotum usually widest in rear half, wing-cases proportionately longer). *Sitona cylindricollis* (often more rounded eyes, head proportionately smaller and narrower, often more greyish, shoulders often paler). *Sitona lateralis* (see that species). *Sitona sulcifrons* (eyes often more rounded, head depressed between eyes and with wider groove). *Sitona hispidulus* (longer, erect bristles on wing-cases, scales not metallic). Other *Sitona* have longer and more erect bristles in the front half of the wing-cases, and more rounded eyes.

Sitona lateralis***

lateralis = of the sides



Size	3.2-4.5 mm
Broad flat scales on wing-cases	Oval
Bristles on wing-cases	Short, almost flat.
Eyes	Almost flat.
Legs	Pale brown.
Other features	
Very like suturalis , differs from other species by the same features (except that <i>lateralis</i> does not have metallic scales). Differs from <i>suturalis</i> by its more mottled wing-cases (usually some stripes in <i>suturalis</i>) and lack of metallic green or blue scales (although pale scales may be pink).	
On rest-harrows <i>Ononis</i> in grasslands. Rare, but easily overlooked as <i>suturalis</i> . Check carefully any flat-eyed and flat-bristled <i>Sitona</i> from rest-harrows.	
Compare: <i>Sitona lineatus</i> (rounded eyes, clear stripes down wing-cases, pronotum usually widest in rear half, wing-cases proportionately longer). <i>Sitona cylindricollis</i> (rounded eyes, head proportionately smaller and narrower, often more greyish, shoulders often paler). <i>Sitona sulcifrons</i> (darker, wing-cases more sparsely scaled, eyes more rounded, head depressed between eyes and with wider groove). <i>Sitona hispidulus</i> (longer, erect bristles on wing-cases). Other <i>Sitona</i> have longer and more erect bristles in the front half of the wing-cases, and more rounded eyes.	
Better known as <i>Sitona ononidis</i> .	



This work by Mark Gurney is licensed under the [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License](https://creativecommons.org/licenses/by-nc-nd/4.0/).