

The Carabid Crib

A supplement to:

Martin L. Luff (2007). *The Carabidae (ground beetles) of Britain and Ireland*. Handbooks for the identification of British insects, volume 4, part 2 (2nd edition). St Albans: Royal Entomological Society.

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Download from <http://markgtelfer.co.uk/beetles/carabidae-ground-beetles/>

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Version 11, 6th March 2013

Minor correction to *Badister* couplet 5. Minor correction to *Notiophilus biguttatus* species account. Correction to *Microlestes maurus* species account. Replacement couplet 1 in key to *Anisodactylus*. Unresolved problem at couplet 1 of key to subgenera of *Harpalus*. New links to photos of crossed elytral epipleura and setiferous punctures inside eye.

Thanks to Clive Turner, Martin Harvey, Richard Wright, Simon Horsnall, Chris Bentley and Andrew Duff for input to version 11.

Note that the couplets were originally formatted so that they could be cut out and pasted into your copy of the Handbook. But beware - in later versions, some of the replacement couplets are much longer than the originals and don't fit.

Please feed back any additions, comments, corrections or improvements via the website.

Page 30 - Key to subfamilies of Carabidae.

2. Mandibles strongly toothed. Antenna inserted on dorsal surface, behind and not external to the mandibles. (Plates, 1, 2; Fig. 4).
..... Cicindelinae (p. 30)

- Mandibles not, or weakly toothed. Antennae inserted laterally, external to the base of the mandibles, and usually external to and below an angled ridge connecting the base of the eye to the base of the clypeus, e.g. Fig. 5). 3

Page 31 - Key to species of *Cicindela*

2. Elytra usually green or sometimes coppery, with discrete small pale spots (Plate 1). 1. *campestris* Linnaeus

- Elytra plain brown or coppery, with a transverse pale band medially extending at least half the width of the elytron (Figs 8, 10). 3

Page 34 – Key to tribes of Carabinae

1. Antennae with many, variously orientated long setae, at least twice as long as the width of segments 2-6 (Fig. 12, Plate 29). Loricerae (p. 56)
- Antennae with fewer, more regularly orientated, shorter setae, and/or with short pubescence, or glabrous. 2
2. Front tibia with no antennal cleaning notches or combs and hence simple. Apex of front tibia with two large apical spurs (which may be unequal in length) (*the orientation of the specimen may mean that either of the apical spurs are obscured by the tibia - rotate the specimen to different orientations to be able to see both*). 3
- Front tibia with some type of antennal cleaning apparatus - a deep notch (Fig. 14) or shallower indentation (Fig. 15) which may be accompanied by a stout, *subapical* spur, and has one or more 'combs' of very small, usually dark coloured, rows of setae. Apex of front tibia with a single large *apical* spur. 6
3. Elytra without basal border (Fig. 16); length more than 10 mm. 4
- Elytra with basal border (Fig. 17); length usually, though not always, less than 10 mm. 5

Page 35 - Key to tribes of Carabinae

7. Scutellum in front of elytra, on a waist or peduncle between elytra, (which lack an angled excision to accommodate them) and pronotum (Fig. 21). 8
- Scutellum at least partly and often fully accommodated in a triangular notch/excision at the base of the elytral suture (as in Figs 22 & 23). (*Note also that specimens that have been preserved in a hypotonic (weak) solution, which results in osmotic ingress of water and expansion of parts of the body, may appear to have such a waist, but which does not fully accommodate the scutellum*). 9
10. Head with deep semi-circular frontal furrows (Fig. 26). Sutural stria usually recurved apically (Fig. 27) in a deep, smooth, conspicuous curve. Trechini (p. 63)
- Head without such deep and curved frontal furrows. Sutural stria usually simple, often joining with one of the outer striae at apex but joining it at an angle, not smoothly, and not especially deeper than other striae. 11

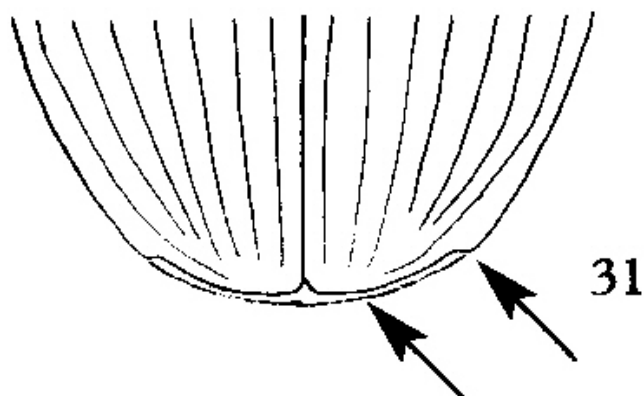
Page 36 - Key to tribes of Carabinae

Note: Setiferous punctures on the mandibles may be very difficult to see on very small species, or where the lie of the antenna obscures the view of the mandible, or on carded specimens where glue may obscure it. If in doubt, look at the general appearance of *Pogonus* and *Patrobus* species (Plates 72 and 73) which are quite distinctive.

11. Outer edge of mandible with setiferous puncture (Fig. 28); length less than 10 mm. 12 (*Pogonus* and *Patrobus*)
- Outer edge of mandible without setiferous puncture; length variable and may be shorter or longer than 10 mm. 13

Page 36 - Key to tribes of Carabinae, couplet 12
 Add (Plate 72) and (Plate 73) to the relevant couplets.

Page 36 - Key to tribes of Carabinae, couplet 14



Note: The revised version of Fig. 31 above shows the minute proportion of the pygidium which is visible in a typical ground beetle. It extends no more than 0.5 mm beyond the elytral apex.

14. Apex of elytra gradually rounded (as in Fig. 1, page 2), or *sometimes* sinuate sub-apically (Fig. 31 above). Apex of abdomen hardly extending beyond elytra, *except sometimes in gravid females and very often in specimens that have been preserved in a hypotonic (weak) solution, resulting in osmotic ingress of water and expansion of parts of the body, including the abdomen which may be extended well beyond the apex of the elytra. If in doubt, compare Plates 5-130 with 131-147.* 15

- [second part of couplet as is]. 24

Page 36 - Key to tribes of Carabinae, couplet 15

Note: The setae inside the eye are often easier to see than the punctures from which they arise but are prone to being broken off, in which case one must look for the punctures. For an excellent photo of two setiferous punctures, see:
<http://www.flickr.com/photos/daddysaurus/8009859549>

15. Head with two setiferous punctures just inside each eye (Fig. 34). The posterior puncture/seta may be *posterior to* the hind margin of the eye by up to $\frac{1}{5}$ the width of the eye. 16

- [second part of couplet as is]. 20

Page 37 - Key to tribes of Carabinae, couplet 18

Note: This character can be very difficult to see on carded specimens, especially small species or where the labial palps have not been set or are obscured by the maxillary palps or base of the antenna - in case of doubt, compare specimen with the general appearance of *Amara* and *Curtonotus* species (Plates 102-109) which are distinctive, although species of Harpalini (Plates 110-121) and Oodini (Plate 124) may look similar.

18. Penultimate segment of labial palpi with three or more setae (Fig. 36).
 Zabryni (part - *Amara* and *Curtonotus*, p. 133)

- [second part of couplet as is]. 19

Page 37 - Key to tribes of Carabinae, couplet 19

Note: Regarding the 'elytral margin crossing the epipleuron near the apex', this feature gives the appearance of a 'crossover' of the inner and outer margins of the elytra, or an indentation of the outer margin below which the epipleuron (the part of the elytron reflexed under the sides) is visible - this is lacking in *Pterostichus cristatus*, variable in extent in the remaining species but always visible. Some more advice here:

<http://www.thewcg.org.uk/pages/crossedepipleurs.htm>

and a superb photo here:

<http://www.flickr.com/photos/daddysaurus/8074596593>

19. Apex of front tibiae strongly widened (Fig. 37) (*this may be obscured by the orientation of the specimen when mounted - view from various angles - it is always apparent*); elytral margin usually crossing the epipleuron near the apex (e.g. Fig. 38). Pterostichini (p. 105)

- Apex of the front tibia narrower, although still somewhat widened towards the apex (Fig. 39); elytral margin always completely simple, with no indentation, 'crossover' or other hiatus near the apex or elsewhere (Fig. 40). Sphodrini + Platynini (p. 116)

Page 37 - Key to tribes of Carabinae, couplet 20

Note: Antennal segments have pubescence (shorter, denser, more decumbent hairs) and setae (longer, sparser, more erect hairs). All species reaching this couplet have pubescence on the 4th and subsequent segments.

20. Third antennal segment pubescent (except sometimes at base of segment). Frequently the 3rd segment is distinctly less pubescent than the 4th and subsequent segments. If in doubt, all specimens under 9 mm go this way. 21

- Third antennal segment without pubescence (but with setae at apex and sometimes on the whole segment), contrasting strongly with the 4th segment. This character works least well for *Chlaenius* (9-13 mm), especially *C. vestitus*, an otherwise easily recognised species. 22

Page 38 - Key to tribes of Carabinae, couplet 26

26. First antennal segment shorter than, or just as long as, the next two segments combined; elytra apices without an obviously separate, fine translucent membranous border. Lebiini (p. 186)

- First antennal segment longer than the next two segments combined; elytra apices with an obviously separate, fine translucent membranous border (Plate 147, Fig. 43). Zuphiini (p. 199)

Page 46 - Key to species of *Leistus*

Note: Couplet 3 refers to "Pronotal epipleura" but this term is not explained in the Morphology section (pp. 1 – 4) and so could cause confusion to anyone who does not already know what this term means. The epipleuron (plural epipleura) of the pronotum is the part that is reflexed underneath the side margin (shaded grey in the edited version of Fig. 2 below).

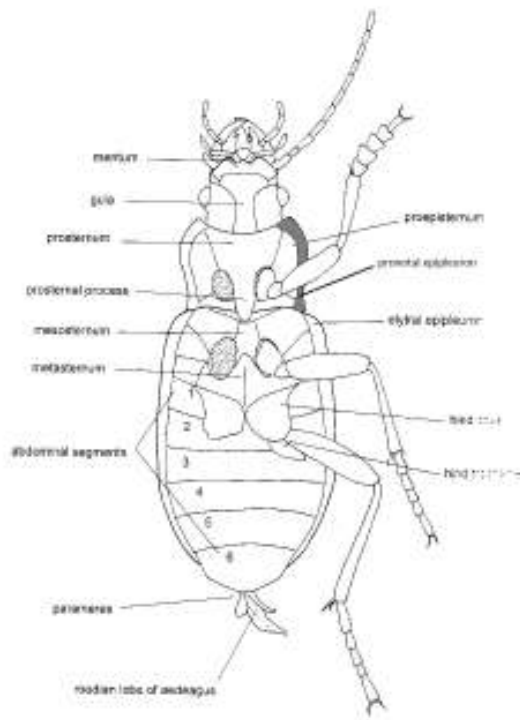


Figure 2. Idealised carabid, ventral view

Page 48 – Key to species of *Nebria*

3. Dorsal surface of hind tarsi with fine, pale hairs (Fig. 60) in addition to the pair of larger setae present at the apex of each segment. These are best seen with light from in front of the beetle. Check all five segments of both hind tarsi and if any dorsal hairs are visible, it is *brevicollis*. Rarely is every hair present and visible as in Fig. 60.
 2. *brevicollis* (Fabricius)

- Dorsal surface of hind tarsi glabrous, except for the pair of larger setae present at the apex of each segment.
 3. *salina* Fairmaire & Laboulbène

Page 51 – Key to species of *Notiophilus*

Note: On each elytron, the fourth elytral interval has one or two dorsal punctures (in the basal two-thirds of each elytron) and two apical punctures (within the pale apical spot).

4. Fourth elytral interval usually with only a single dorsal puncture (e.g. Figs. 62 & 63), occasionally a second puncture on one or both elytra. Frons with 5-6 coarse ridges; sides of pronotum more sinuate but subject to variation (Fig. 64).
 3. *biguttatus* (Fabricius)

- Fourth elytral interval usually with two dorsal punctures. Frons with 7-10 fine ridges; sides of pronotum almost straight (Fig. 65).
 6. *quadripunctatus* Dejean

5. Legs entirely black. 6

- Tibiae reddish or brown, paler than femora. Both species, especially northern and upland specimens, can have very dark legs with a small paler area in the middle of each tibia, best seen against the light. 7

Page 52 –*Notiophilus biguttatus* species account

Under the subheading **Similar species**: “*N. quadripunctatus* (6) has ... two punctures on the third elytral interval” should be “... fourth elytral interval”.

Page 56 - *Loricera pilicornis* species account

Replace “Elytra each with ten punctured striae; ...” with “Elytra each with twelve punctured striae; ...”. This appears to be unique amongst British and Irish carabids with striate elytra. A few (e.g. *Omopron*, *Calosoma*) have more, most have 9 striae plus a short 10th scutellar stria. “10” rather than “12” was a misprint in Lindroth (1974).

Page 57 - Key to genera of Scaritini

1. Length at least 5 mm. Outermost elytral interval punctured throughout (side view Fig. 72). 1. *Clivina* Latreille (p. 57)

- Length usually less than 5 mm. Outermost elytral interval largely unpunctured (with 0-3 punctures in basal half and 2-3 in apical half). Note: these are the ‘marginal punctures’ referred to subsequently in the keys. 2. *Dyschirius* Bonelli (p. 57)

Page 58 - Key to species of *Dyschirius*

4. Surface dull, microsculpture evident. 3. *obscurus* (Gyllenhal)
Reliably recorded only from Kent & Sussex in Britain, and the Lough Neagh area in Northern Ireland (NOT reliably recorded from Norfolk).

- Surface shining, without obvious microsculpture. Beware: tunnelling in sand wears the surface of *Dyschirius* such that dull individuals of *thoracicus* are not uncommon and have often been mistaken for *obscurus*.
..... 4. *thoracicus* (Rossi)

6. Front tibia with at least one distinct sharp tooth on outer side (Fig. 76).
Elytra with 2-3 marginal punctures in basal half. 7

- Front tibia with at most a blunt tubercle on outer side (Fig. 77). Elytra with a single marginal puncture in basal half. 9

Page 60 - *Dyschirius obscurus* species account

Delete ‘... and Norfolk’.

Norfolk records have proved to be based on worn, dull specimens of *D. thoracicus*.

Page 70 - Key to genera of Bembidiini

4. Sutural stria recurved at apex of elytron (Fig. 99). Dorsal puncture(s) (either 1 or 2) on third elytral interval positioned in apical half of elytra. ..
..... 4. *Ocys* Stephens (p. 74)

- Sutural stria usually not recurved. Foremost dorsal puncture on third elytral interval (usually there are 2) positioned in basal half of elytra.
..... 5

Page 73 - Key to species of *Asaphidion*

The following alternative key should give more accurate results. It is also available as part of a free illustrated ID guide in PDF format by Mark G. Telfer and John Walters. Download here:

<http://dl.dropbox.com/u/48019879/websiteDownloads/gbb/11%20Asaphidion.pdf>.

- 1a Body length 5.0 - 6.0 mm. *pallipes*
1b Body length 3.9 - 4.7 mm. 2
2a Penultimate (largest) segment of maxillary palp yellow with metallic blackening over most of the upper surface. *stierlini*
2b Penultimate (largest) segment of maxillary palp entirely yellow or sometimes faintly darkened making the segment slightly darker than adjacent segments. 3
3a Antennae darker. Antennal segments 6-10 brown to blackish-brown. Antennae more contrasting, with segments 1-4 yellow and 5-11 brown to blackish-brown (usually darkest on segments 6-10, so with 5 and 11 paler). The contrast in colour between segments 4 and 5 is greater than between segments 5 and 6. Sides of pronotum more evenly rounded with a bulge at the lateral seta. Penultimate segment of maxillary palp sometimes brownish though normally yellow. Legs darker yellow, usually with knees darker. Upper surface sometimes more strongly punctured. *flavipes*
3b Antennae paler. Antennal segments 6-10 yellowish-brown, never blackish-brown. Antennae less contrasting, with segments 1-4 yellow, darkening from 5 onwards with segments 7-10 being the darkest, and 11 paler. The contrast in colour (if any) between segments 4 and 5 is the same as between 5 and 6. Sides of pronotum more angular, almost straight in front of and behind the lateral seta and forming a more distinct angle at the seta. Penultimate segment of maxillary palp always yellow. Legs paler yellow, usually without any darkening at the knees. Upper surface not as strongly punctured. *curtum*

Page 77 - Key to subgenera of *Bembidion*

Clive Washington suggests adding the qualifier “although a small tooth may be present at the hind angle” to the first part of the couplet as it’s quite easy to misread this description to mean that the hind angle itself is rounded – which is not the case.

6. Sides of pronotum rounded, hind angles not protruding, although a small tooth may be present at the hind angle (Plates 70, 71, Figs 143 – 145, p. 100). 7

- Sides of pronotum sinuate before hind angles, which are at least slightly protruding (as in Figs 124, 125, 133 – 136, pp. 85, 88). 8

Page 79 - Key to subgenera of *Bembidion*

The problem identified by David M. Green (<http://tech.groups.yahoo.com/group/beetles-britishisles/message/7188>) is that two species of subgenus *Ocydromus* (*saxatile* and *decorum*) have well-marked elytral striae, closer in appearance to subgenus *Bembidionetolitzkya* than to the remainder of *Ocydromus*. They should both key out at couplet 21 but could go the wrong way at couplet 18 and run into trouble at couplet 19.

The best solution would be to insert the current couplet 21 to before couplet 18. Thus:

Renumber couplet 14 as follows:

14. Dorsal punctures on third elytral interval not touching third stria (Fig. 116). 15

- Dorsal punctures on third elytral interval touching or forming part of third stria (Fig. 117). 21

Renumber couplet 21 as follows:

21. Head with fine punctures behind and inside the eyes (Fig. 121).
..... 12. *Ocydromus* Dejean (part: *saxatile* and *decorum*) (p. 87)

- Head unpunctured behind and inside the eyes. 18

Renumber and reword couplet 18 as follows:

18. Elytral striae fainter or absent laterally and/or apically; 7th stria often very faint or absent, much weaker than the 6th. 19

- Elytra with at least the inner seven striae well-marked, hardly fainter towards apex and sides; 7th stria not markedly weaker than the 6th. 22

Page 100 – Key to species of *Bembidion* (*Philochthus*)

Note: Wings are present in both *guttula* and *mannerheimii* but usually distinctly longer in *guttula* and shorter in *mannerheimii*.

5. Pronotum less rounded at sides, narrower than the rather elongate elytra (Fig. 144); elytra with sub-apical pale spot distinct; wings usually so long that they must be folded to be packed away beneath the elytra but in the short-winged form they reach the base of the 5th abdominal tergite.
..... 51. *guttula* (Fabricius)

- Pronotum more rounded at sides, almost as wide as the rather short and rounded elytra (Fig. 145); apex of elytra sometimes generally paler but without distinct sub-apical spot; wings very short, clearly inadequate for flight. 54. *mannerheimii* Sahlberg

Page 104 – *Patrobus* species accounts

Antennal differences between the three species are described as follows:

assimilis: “rounded, rather short, third segment not longer than first (Fig. 148)”.

atorrufus: “parallel-sided, third segment longer than first (Fig. 149)”.

septentrionis: “slightly rounded, third segment just longer than first”.

The “rounded”, “parallel-sided” and “slightly rounded” nature of the antennal segments is best appreciated on segments 5 – 11 and refers to the segments in full-face view (the segments are flattened and naturally tend to lie in side view when carded!). “Straight-sided” would be a better description for *atorrufus*.

Page 110 – Key to species of *Pterostichus*

Note: On carded specimens it can be very difficult to illuminate the prosternum well enough to see punctures or to be sure that punctures are

absent. The differences in the shape of the pronotal side margin described on p. 115 are very useful.

18. Prosternum shining and punctured above base of front legs (side view Fig. 172); legs pale brown or red. Pronotal sides distinctly sinuate well in front of the hind angles. 19. *strenuus* (Panzer)

- Prosternum dull and unpunctured; legs dark brown or black. Pronotal sides only slightly sinuate in front of hind angles. 18. *diligens* (Sturm)

Page 117 – Key to genera of Sphodrini and Platynini

9. Length less than 6.5 mm. Elytral striae punctured (especially distinct in basal half of elytra) (Plate 95). 7. *Oxypselaphus* Chaudoir (p. 124)

- Length greater than 6.3 mm. Elytral striae impunctate throughout. (Plate 96). 8. *Paranchus* Lindroth (p. 124)

Page 129 – Key to species of *Agonum sensu stricto*

Note: *Agonum muelleri* normally has three punctures in the third elytral interval but quite frequently has four, five or even six on at least one side, leading to confusion with *A. gracilipes*.

2. Third elytral interval with four to eight punctures; side borders and foveae of pronotum roughly sculptured or punctured (Fig. 200). 3

- Third elytral interval with three to six punctures; side borders and foveae of pronotum smooth. 5

Page 136 – Key to species of *Amara sensu stricto*

5. Elytral striae fine to elytral apex where intervals are utterly flat, as in *Amara aenea*. 6

- Elytral striae deepened to apex where elytral intervals are slightly convex. 7

7. Length more than 7.5 mm (exceptionally to 7.3 mm); apical antennal segments at least twice as long as wide (Fig. 219). Females (front tarsi same width as mid-tarsi) with 2 bristle-bearing punctures on last sternite. 12. *lunicollis* Schiöde

- Length less than 7.5 mm; apical antennal segments less than twice as long as wide (Fig. 220). Females (front tarsi same width as mid-tarsi) with 4 bristle-bearing punctures on last sternite. 7. *curta* Dejean

Page 145 – Key to species of *Amara (Bradytus)*

Note: Near the pronotal hind-angle, a ridge runs roughly longitudinally, separating the outer fovea from the side-margin. Very close to the hind-angle a pore bears a long seta.

2. Ridge meets the pronotal hind margin without interruption; pore lies outside of the ridge; ridge less oblique (more nearly parallel to the longitudinal axis of the body) (Fig. 238). Elytra widened just behind front angles which are therefore obtuse (Fig. 238, Plate 107). 24. *apricaria* (Paykull)

- Ridge does not meet the pronotal hind margin but is interrupted by the pore; ridge slightly more oblique (Fig. 239). Elytral sides less widened just behind front angles which are therefore less obtuse (Fig. 239).
..... 25. *consularis* (Duftschmid)

Page 148 - Tribe Harpalini

In the first sentence of the paragraph, change "... no seta at the pronotal hind angle ..." to "... usually no seta at the pronotal hind angle (though this is present in *Trichocellus* and *Dicheirotichus*) ..."

Page 148 – Key to genera of Harpalini

Note: The 'scutellary stria' of the elytron is illustrated in Fig. 1 on page 2.

- 1. Scutellary stria absent or very faintly marked (Plates 116, 117); at least 8th and 9th elytral intervals punctured and pubescent. 2
- Scutellary stria present and as well-marked as the other elytral striae. If the scutellary stria is less well-marked than other stria, the elytra are not pubescent. 3

Page 149 – Key to genera of Harpalini

- 8. Longer apical spur of hind tibiae about as long or longer than the first hind tarsal segment (Fig. 244). 1 *Harpalus* Latreille (part) (p. 149)
- Longer apical spur of hind tibiae considerably shorter than first hind tarsal segment (Fig. 245). 3. *Anisodactylus* Dejean (p. 165)

Page 150 – Key to subgenera of *Harpalus*

Andrew Duff has noted that couplet 1 is not reliable. This is the original version:

- 1. Tarsi with fine dorsal pubescence (view mid tarsi -Fig. 247). 2
- Tarsi with lateral and ventral setae but no dorsal pubescence.
..... 2. *Harpalus sensu stricto* (p. 151)
- 2. Elytra wholly or partly pubescent.
..... 1. *Pseudoophonus* Motschulsky (p. 150)
- Elytra entirely non pubescent.
..... 3. *Cryptophonus* Brandmayr & Zetto Brandmayr (p. 158)

The tarsi of the three species of *Pseudoophonus* would be more accurately described as being covered in setae on the dorsal surface. The setae are longer, stiffer and finer than is implied by "fine dorsal pubescence" and Fig. 247 is misleading in this regard. Neither Andrew nor I has been able to examine a specimen of *H. (Cryptophonus) melancholicus* but the other British species of *Cryptophonus* (*H. tenebrosus*) has the tarsi glabrous above except for a few apical setae and one to several setae elsewhere on the dorsal surface of especially the basal tarsal segment. Members of subgenus *Harpalus s.s.* may also have a few dorsal setae so this is an unsatisfactory way to begin a key to *Harpalus*. I can see no simple remedy for this other than to urge caution when using Luff's key, and to consider using the keys by Lindroth (1974) or Duff (2012) as alternatives.

Duff, A.G. (2012). *Beetles of Britain and Ireland. Volume 1: Sphaeriusidae to Silphidae*. West Runton: A.G. Duff.

Lindroth, C.H. (1974). *Coleoptera, Carabidae*. Handbooks for the identification of British insects, vol. 4, part 2. London: Royal Entomological Society. Download PDF here: http://www.royensoc.co.uk/sites/default/files/Vol04_Part02.pdf

Page 150 – Key to species of *Pseudoophonus*

2. The last three abdominal segments are pubescent at the sides but bare in the middle (except for a pair of long setae on each segment, either side of the middle). Hind-angles of pronotum more distinct and acute, and sides hardly paler. Usually larger: 11 - 16 mm. 2. *rufipes* (De Geer)

- The last three abdominal segments are pubescent in the middle but bare towards the sides (also with a pair of long setae on each segment, either side of the middle). Hind-angles of pronotum more rounded and obtuse, and sides usually more broadly pale. Usually smaller: 8 - 12 mm.
..... 1. *griseus* (Panzer)

Page 151 – Key to species of *Harpalus sensu stricto*

4. Length usually more than 12 mm (exceptionally as small as 10 mm?). Abdominal segments 3, 4 & 5 with distinct patches of fine pubescence (as well as the usual pair of long setae); some pubescence also on abdominal segment 6. 6. *dimidiatus* (Rossi)

- Length usually less than 12 mm. Abdominal segment 3 with distinct patches of fine pubescence but reduced to a few hairs on 4 & 5 (as well as the usual pair of long setae); pubescence absent on abdominal segment 6. 5

Page 165 – Key to species of *Anisodactylus*

Note: Relying too heavily on colour to separate *poeciloides* from the other two species of *Anisodactylus* has been shown to be unreliable by Richard Wright in *Beetle News* volume 1, part 3 of October 2009.

1. Apical spur of front tibia three-pronged (similar to *Amara plebeja* and *A. strenua*). Hind angles of pronotum rounded. Upper surface usually metallic golden-green but as many as 40% are black with a variable degree of bluish metallic colouring. 3. *poeciloides* (Stephens)

- Apical spur of front tibia with a single point (normal for most carabids). Hind angles of pronotum distinct, with a small protruding tooth (Fig. 283). Upper surface always black..... 2

Page 170 - Key to species of *Bradycellus*

5. Entire basal third and anterior median region of pronotum with extensive punctures (Fig. 289). No dorsal punctures in third elytral interval: hard to see when they're present, so hard to be sure they're absent! Rare coastal species. 3. *distinctus* (Dejean)

- Base of pronotum less punctured, especially centrally; front of pronotum with at most a few scattered punctures. Third elytral interval with a dorsal puncture beside the second elytral stria: small and hard to see, so hold the specimen and tilt in the light, looking about 60-70% of the way back from base to apex. Two commoner species. 6

Page 171: *Bradycellus distinctus* species account

“now only at Dungeness, Kent” implies it has gone extinct in the rest of its range from South Lancashire round the south coast to East Anglia. Most records do come from Dungeness, but it has also been recorded recently from South Essex, Deal (East Kent) and Co. Wexford.

Page 174 - Key to species of *Acupalpus*

5. Apical third of elytra with a minute pore on the third interval (Fig. 295), occasionally missing on one or even both sides! Pronotum and/or suture often partly dark but if pale, never contrastingly brighter than rest of upper surface. 6

- Apical third of elytra without any pore on the third interval. Pronotum uniformly bright red-brown, and elytral suture also bright red-brown.
..... 5. *flavicollis* (Sturm)

Page 182 - Key to species of *Badister*

Badister dilatatus averages larger (4.5 – 5.4 mm) than *B. collaris* (4.2 – 5.0 mm) and *B. peltatus* (4.3 – 5.0 mm) but there is much overlap. The revised couplet relegates size difference to a minor character.

5. Pronotal hind angles more rounded (Plate 128). Mandibles more curved apically (Fig. 305). ♂: Aedeagal apex with a ventral hook well-removed from, and pointing away from, apex (side view Fig. 306). Averages larger (4.5 – 5.4 mm, usually greater than 5.0 mm)..... 6. *dilatatus* Chaudoir

- Pronotal hind angles obtuse but more distinct (Fig. 307). Mandibles less curved apically (Fig. 308). ♂: Aedeagal apex not as above. Averaging smaller (4.2 – 5.0 mm) 6

Accurate identification of females of this trio of species, especially of *B. collaris* and *B. peltatus* is very difficult unless associated with dissected males. Lone females are best identified using Kevan, D.K. (1955). The identification of *Badister peltatus* (Pz.), *dilatatus* Chaud., and *anomalus* (Perris) [= *collaris*] (Col., Carabidae, Licinini). *Entomologist's monthly magazine*, **91**, 207 – 210.

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1. Elytra punctured throughout and usually pubescent; length usually more than 8 mm. 3. *Cymindis* Latreille (p. 190)

- Elytra if punctured, not pubescent except at extreme margins (EXCEPT in *Lebia cyanocephala* which has the elytra sparsely pubescent throughout (see <http://www.koleopterologie.de/gallery/fhl02/lebia-cyanocephala-foto-krejci.html>)); length at most 8 mm. 2

6. Elytral apices transversely truncate (Fig. 315); third antennal segment pubescent. 8. *Microlestes* Schmidt-Göbel (p. 196)

- Elytral apices obliquely truncate (Fig. 316; Plates 142 and 144); third antennal segment glabrous in two of the species, pubescent in apical half of third segment in *S. truncatellus*. 10. *Syntomus* Hope (p. 197)

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7. Body slender, with both elytra together nearly twice as long as wide (see Plate 138); pronotum quadrate or elongate.
..... 4. *Paradromius* Fowler (p 191)

- Body broader, elytra relatively less elongate, much less than twice as long as wide (Plates 139-141); pronotum quadrate (Fig. 317) or transverse (Fig. 318). 8

Page 196 - Key to species of *Microlestes*.

Delete 'Plate 142' in second part of couplet 1: this photograph is *Syntomus truncatellus*.

Page 197 - *Microlestes maurus* species account.

Replace "Wings absent" with "Wings present but usually obviously too short to be used for flying, even though they may be long enough that the apical part is folded back to fit under the elytra".

Page 197 - *Microlestes minutulus* species account.

Delete 'Plate 142': this photograph is *Syntomus truncatellus*.

Page 198 - Key to species of *Syntomus*

2. Elytra more elongate and parallel-sided, with pale shoulder-mark (Fig. 333). Third antennal segment glabrous, with only the apical setae.
..... 2. *obscuroguttatus* (Duftschmid)

- Elytra shorter, more rounded (Fig. 334; Plate 142) and uniformly black. Third antennal segment pubescent in apical half, and with the apical setae.
..... 3. *truncatellus* (Linnaeus)

Plate 142

Caption should read:

142 *Syntomus truncatellus*

2.8 - 3.3. mm