ANT-LIKE FLOWER BEETLES (COLEOPTERA: ANTHICIDAE) OF THE UK, IRELAND AND CHANNEL ISLES

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ABSTRACT

The Anthicidae or ant-like flower beetles of the UK, Ireland and Channel Isles are reviewed. A species list, identification key, short diagnoses and illustrations of all taxa are given. Brief information on known ecological preferences of species is given.

Key words: identification, distribution, key, United Kingdom, Ireland, fauna, ecology.

INTRODUCTION

Anthicidae are a cosmopolitan family of small to medium-sized, fast-moving beetles of the superfamily Tenebrionoidea. Anthicidae are represented in the World fauna by approximately 100 genera, and about 3500 species (Chandler, 2010). Only a few species are known from the fossil record. The last revision of the British Anthicidae was published by F. D. Buck (1954) in the well-known series *Handbooks for the Identification of British Insects*. Since then, there have been numerous nomenclatural changes within Anthicidae, and some additional species (introduced) have been recorded from the UK, making Buck's key out of date.

During 2004 and 2005 a total of 3356 specimens of Anthicidae from the UK and Ireland were examined by the author, mainly from the collections of The Natural History Museum (London), Oxford University Museum of Natural History and National Museum of Ireland. Additional data for more than 2100 specimens were received from other British museums and private collections between 2005 and 2007.

A new key and short diagnoses for the genera are presented, as well as data on habitats and general distribution of species. Palaearctic genera follow Chandler, Nardi & Telnov (2004). The distributional lists provided are not intended to be comprehensive, but will give a general idea of the species occurrence. The following publications have been consulted for data on distribution and ecology, particularly for Channel Islands fauna: Ansted & Latham, (1862); Luff (1894, 1895, 1900 & 1905); Last (1951, 1957, 1966, 1970, 1980 & 1990); Lane (1990) and Duff (2008).

Only species with long-term established populations in the British Isles *sensu lato* are included in this key. *Floydwernerius australis* (King) and *Notoxus numidicus* (Lucas) are excluded for this reason but are described in the detailed species descriptions that follow. The key is based primarily on external morphological characters. For the confirmation of identification for some species, dissection of male genitalia is recommended. A synoptic checklist is provided below to assist with some recent nomenclatural changes that affect the UK literature indicated with square brackets.

Short checklist of taxa native to the UK, Ireland and Channel Islands

ANTHICINAE Latreille, 1819
ANTHICUS Paykull, 1798
subgenus ANTHICUS Paykull, 1798
angustatus Curtis, 1838
antherinus antherinus (Linnaeus, 1760)
bimaculatus (Illiger, 1801)
flavipes flavipes (Panzer, 1796)
scoticus Rye, 1872 [Buck, 1954; Joy, 1932; Pope, 1972]
tristis schaumii Wollaston, 1857

CORDICOLLIS Marseul, 1879
CORDICOMUS Pic, 1894
ANTHICUS sensu auctt. partim non Paykull, 1798
instabilis instabilis (W. L. E.Schmidt, 1842)
tibialis (Curtis, 1838) non (Waltl, 1835)

CYCLODINUS Mulsant & Rey, 1866
ANTHICUS sensu auctt. partim non Paykull, 1798
constrictus constrictus (Curtis, 1838)
humilis sensu auctt. Brit. non (Germar, 1824) [Joy, 1932]
salinus salinus (Crotch, 1867)
crotchi (Pic, 1893) [Joy, 1932]

HIRTICOLLIS Marseul, 1879
ANTHICUS sensu auctt. partim non Paykull, 1798
hispidus (Rossi, 1792)

OMONADUS Mulsant & Rey, 1866
ANTHICUS sensu auctt. partim non Paykull, 1798
bifasciatus (Rossi, 1792)
floralis (Linnaeus, 1758)
formicarius formicarius (Goeze, 1777)
quisquilius (Thomson, C. G., 1864) [Buck, 1954]

STRICTICOLLIS Marseul, 1879
STRICTICOMUS Pic, 1894
ANTHICUS sensu auctt. partim non Paykull, 1798
tobias (Marseul, 1879)

NOTOXINAE Stephens, 1829
NOTOXUS Geoffroy, 1762
monoceros (Linnaeus, 1760)

Identification Key to species of Anthicidae of U.K., Ireland and Channel Isles

1. Pronotum with elongated process (horn) on the anterior margin, extending anteriorly over head (Fig. 1, Plate 8d & e); size 4.0–5.20 mm . *Notoxus monoceros*
– Pronotum without elongated process on anterior margin 2
2. Anterior tibiae with a tooth externally near apex (Fig. 2); tibial spurs long; body robust, elytra broad and strongly rounded laterally; colour yellow to light yellowish brown, elytra with V-shaped dark transverse marking behind middle (sometimes reduced to a pair of separate macula) (Plate 6d); size 2.95–4.10 mm . . . . . *Anthicus bimaculatus*
– Anterior tibiae without apical tooth; tibial spurs reduced; body more slender; colour not as above 3
3. Head and pronotum yellow to reddish, elytra black or brown with basal third yellow and raised medially to oval postmedian spot on each elytron (Plate 8c); eyes large, temples short; size 3.00–4.50 mm. . . . . *Stricticollis tobias*
– Dorsal colouration not as above (at least head and thorax dark) 4
4. Head and thorax with microsculpture between punctures 5
– Head and thorax smooth between punctures, with at most scarcely visible isodiametric microsculpture 7
5. Pronotum anteriorly with pair of small protuberances on disc (best seen obtusely from side). Mesosternum broadly expanded laterally, covering most of the mesepisterna on the ventral surface; the expanded portion with margins almost semicircular and often bearing a fringe of long setae at their edges (Fig. 20); colour variable, dorsum reddish-brown to almost black, only pronotum and basal third of elytra reddish; size 2.50–3.70 mm . . . . . *Omonadus floralis*
– Pronotum anteriorly lacking small protuberances on disc. Mesosternum not expanded laterally, its lateral margins straight or curved, leaving most of mesepisterna exposed on ventral surface; without fringe of setae on margins of mesosternum 6
6. Dorsum with sparse, short and appressed pubescence; erect tactile setae short, sparse and inconspicuous; elytra brown to dark brown with reddish basal area (Plate 8b); size 2.70–3.70 mm . . . . . *O. formicarius formicarius*
– Dorsum with sparse, short and appressed pubescence, with sparse, moderately long erect setae; elytra dark brown to black, with two pale transverse bands, one in postbasal impression, the second, in postmedian area (both bands may be interrupted at suture) (Plate 7f); size 2.50–3.00 mm. . . . . *O. bifasciatus*
7. Body and legs covered with exceptionally long, dense and erect pubescence; size 2.40–3.10 mm . . . . . *Hirticollis hispidus*
– Body and legs covered without exceptionally long, appressed pubescence . . . 8
8. Base of head subconical (Plate 7b–d), medially subangulate or bluntly pointed, basal angles absent 9
– Base of head more or less truncate (Plate 6e,f), not or only slightly produced medially, basal angles evident 10
9. Pronotum slightly larger than head; pronotum more strongly punctate than head and elytra; base of head slightly elongated to a medial blunt point; first antennomere asymmetrical in profile (Plate 8f); colour dark brown to almost black; size 2.20–3.00 mm . . . . . *Cyclodinus salinus salinus*
– Pronotum not wider than head, dorsally more strongly punctate than head and elytra; base of head subconical, with subparallel short temples; first antennomere symmetrical in profile (Plate 8f); colour variable, from reddish

brown to almost black, often with indistinct pale spots (sometimes completely absent) in postbasal and postmedian area of elytra; size 2.00–2.70 mm . . . . . *C. constrictus constrictus*

10. Mesosternum relatively small, with apex in the form of a narrow strip (slightly raised medially), lateral parts broadly rounded separating mesepisterna from the coxal cavities; eyes large, convex and prominent; whole dorsal surface of the head coarsely punctured; pronotum distinctly constricted on sides behind the middle; humeri well developed; punctures on head and pronotum more or less annulate; male with hind tibiae spatulate (Fig. 10): generally larger species 3.00–4.30 mm . . . . . *Cordicollis instabilis instabilis*

– Front of mesosternum with oblique sides, slightly prominent in the median region, lateral parts narrow, not separating mesepisterna from the coxal cavities; eyes smaller, weakly prominent; dorsal surface of the head often with impunctate median line; pronotum not constricted on sides behind the middle; punctures on head and pronotum simple; male hind tibiae simple; size $\geqslant$ 3.65 mm 11

11. Pronotum short, slightly longer than broad, gradually and slightly narrowing laterally to base; elytra distinctly widened laterally in median part; size 2.00–2.70 mm. . . . . *Anthicus flavipes flavipes*

– Pronotum distinctly longer than broad, constricted laterally behind the middle and with base distinctly narrower than apex. 12

12. Head with a broad impunctate median line reaching vertex; pronotum not distinctly constricted at sides behind middle; dorsum brown to dark brown; size 2.40–2.70 mm . . . . . *A. angustatus*

– Head completely punctate; pronotum distinctly narrowed towards base . . . 13

13. Elytra with red marking of variable form, most often an ovoid posthumeral spot on each elytron and cruciate median spot (Plate 6b); dorsum densely and closely punctate, distance between punctures less than their diameter; temples almost straight; size 2.80–3.65 mm . . . . . *A. antherinus antherinus*

– Elytra with two pale transverse bands broadly interrupted at suture, one posthumeral, a second postmedian (bands may be indistinct) (Plate 6f); dorsum sparsely punctate, distance between punctures greater than their diameter; temples slightly rounded; size 2.30–3.00 mm . . . . . *A. tristis schaumii*

Abbreviations used within the text

Depositaries

BENHS – British Entomological and Natural History Society, Dinton Pastures;

BMAG – Bolton Museum, Art Gallery and Aquarium, Rye collection;

BMNH – The Natural History Museum (British Museum, Natural History), London;

NMID – National Museum of Ireland, Dublin;

OUMNH – Oxford University Museum of Natural History, Oxford.

General

H – homonym; [i] – imported species; RN – replacement name.

All cited label text is reproduced exactly, with no corrections or additions; labels are separated by slashes /. The present author's comments are placed in square brackets [ ]. Citations of localities from references are placed in "quotation-marks". The taxa are listed alphabetically (except in the identification key), since there is no modern systematic arrangement. Ecological data presented are only relevant to the United Kingdom, Ireland and Channel Islands.

LIST OF TAXA

FAMILY ANTHICIDAE – ant-like flower beetles

Description: Head abruptly constricted, neck short to long, sometimes with broad temples; eyes transversely oval (rarely emarginate, unlike Aderidae); antenna 11-segmented, filiform or slightly enlarged apically. Pronotum widest in the anterior half, more or less distinctly narrowing to the base, pronotal base narrower than elytral base. Abdominal sternites I–II freely articulated. Legs generally slender, femora sometimes clavate; tarsal formula 5–5–4.

Distribution: Cosmopolitan.

Diversity: Eight subfamilies, about 100 recent genera and 3500 described species.

SUBFAMILY ANTHICINAE

Distribution: Cosmopolitan.

Diversity: Four tribes (Anthicini, Endomiini, Formicomini, Microhorini), 42 genera, about 2500 species.

Genus *ANTHICUS* Paykull, 1798: 253

Type species: *Meloe antherinus* Linnaeus, 1760

Synonyms: *Birricollis* Marseul, 1879; *Birricomus* Pic, 1894; *Brevicollis* Marseul, 1879; *Brevicomus* Pic, 1894; *Cartolus* Mulsant & Rey, 1866; *Cartolus* Mulsant & Rey, 1866 [H]; *Curticollis* Pic, 1892; *Curticomus* Pic, 1894; *Eonius* C. G.Thomson, 1864; *Nathicus* Casey, 1895; *Nodolinus* Mulsant & Rey, 1866a; *Nodolinus* Mulsant & Rey, 1866b [H]; *Platylorus* Mulsant & Rey, 1866a; *Platylorus* Mulsant & Rey, 1866b [H]; *Pubicollis* Marseul, 1879; *Pubicomus* Pic 1894; *Recticollis* Marseul, 1879.

Distribution: Cosmopolitan.

Diversity: Two subgenera of about 600 species and subspecies, 172 of which occur in the Palaearctic region.

Anthicus angustatus Curtis Plate 6a, Fig. 3

Description: Length 2.40–2.70 mm. Dorsally brown to dark brown. Femora dark, tibiae and tarsi pale. Antennae pale. Head dorsally flattened, coarsely punctate, with a glossy impunctate median longitudinal line that does not reach the vertex. Eyes rather small, weakly prominent. Temples somewhat widened towards the truncate, broadly rounded base. Pronotum elongate, dorsally slightly convex, anteriorly wider than basally, almost straight laterally, densely punctate. Elytra elongate, almost completely rounded at base, humeri absent, without postbasal transverse impression, dorsally densely and partly coarsely punctured. Hind wings atrophied. Dorsal pubescence whitish, quite dense and appressed.

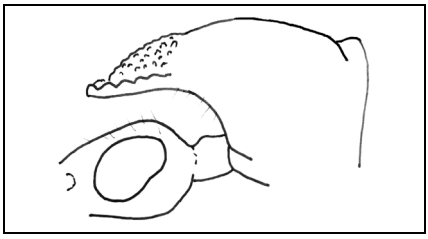


Fig. 1. Genus *Notoxus*: schematic lateral view of forebody (orig.).

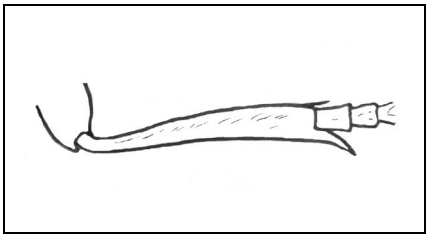


Fig. 2. *Anthicus bimaculatus*: right foretibia (orig.)

Ecology and Biology: Commonly found on sandy shores and salt marshes, in or on bare sand with sparse or no vegetation. Adults and larvae are saprophagous feeding on decaying plant material. Adults are active from May to September. Listed as Nationally Notable B in Hyman (1992).

Distribution. **U.K.**: Dorset, East Cornwall, East Sussex, Isle of Wight, West Cornwall, South Devon, Middlesex, South Lancashire, Isle of Man, West Sussex. **Ireland**: Present. **Channel Islands**: Herm, Jersey. **Palaearctic:** France, U.K., Ireland, Spain (incl. Canary Islands).

Anthicus antherinus antherinus (Linnaeus) Plate 6b & c, Fig. 4

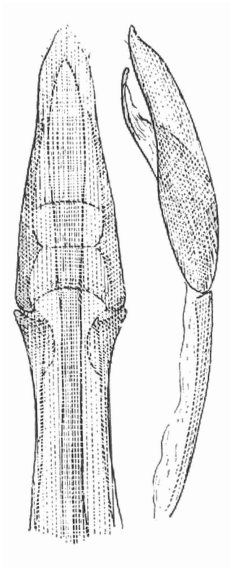
Description: Length 2.80–3.65 mm. Body flattened, black with variable red markings. These markings consist of an ovoid posthumeral spot on each elytron and cruciate median spot (Plate 6b) or can be strongly reduced to only the humeral area (Plate 6c). Femora darker than the reddish tibia and tarsi. Antennomeres usually paler basally, darkening towards apex, terminal antennomeres 2–3 always dark. Head and thorax densely punctate. Eyes rather small, weakly prominent; temples almost straight, base of head truncate to broadly rounded. Elytra subparallel, without postbasal transverse impression; punctures and intervening spaces on elytra larger than on head and pronotum; pubescence of quite dense pale, appressed setae. Hind wings fully developed.

Ecology and Biology: Eurytopic in open habitats, with a preference for dry microhabitats. Found in salt marshes, meadows, forest edges and sea shore. Often found in urban or agricultural landscapes (e.g. hedgerows). Adults and larvae saprophagous, adults occasionally found on wild plants, for example, *Rumex* spp. (Polygonaceae). Adults are active from March to November, occasional records from January (presumably of hibernating adults).

Distribution. **U.K.**: Aberdeenshire, Bedfordshire, Berkshire, Buckinghamshire, Cambridgeshire, Derbyshire, Dorset, East Gloucestershire, East Kent, East Norfolk, East Suffolk, East Sussex, Herefordshire, Huntingdonshire, Isle of Wight, Merionethshire, Middlesex, North Essex, North Somerset, North Wiltshire, Oxfordshire, South Essex, South Hampshire, Staffordshire, Surrey, Warwickshire, West Kent, West Norfolk, West Suffolk, West Sussex and Worcestershire. **Palaearctic:** Afghanistan, Albania, Austria, Azerbaijan, Belarus, Bosnia & Herzegovina, Bulgaria, Croatia, Czech Republic, Cyprus, Denmark, Estonia, Finland, France, Georgia, Germany, Great Britain, Greece, Hungary, Iran, Israel, Italy, Kazakhstan, Latvia, Lebanon, Lithuania, Macedonia, Moldova, Norway, Poland, Portugal (incl. Azores Islands, not on Madeira), Romania, Russia (both European & Asian), Slovakia, Slovenia, Spain (not on Canary Islands), Sweden, Switzerland, Syria, Turkey, Turkmenistan, Ukraine, Uzbekistan and former Yugoslavia.

Notes: The subspecies, *Anthicus antherinus syriae* Pic, 1892 occurs in Afghanistan, France (record needs confirmation), and "Syria" [*sensu lato*]. An extremely similar species, *Anthicus invreai* Koch, 1933 is known from the Balkans, France, Greece, Italy, Spain, Near East (Lebanon), Turkey, and former Yugoslavia (aedeagus – Fig. 5), and atypical specimens of *antherinus* collected on the south-coast of the UK should be compared with the figures provided.

Taxonomy: The type series of *Anthicus antherinus* ab. *ireneae* Donisthorpe (1935a) was studied from the collections of the Natural History Museum. London. Although



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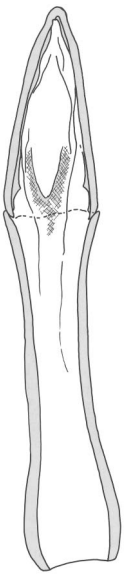

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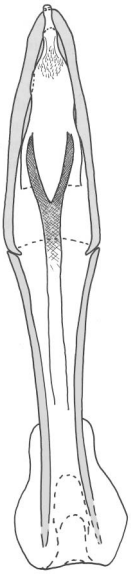

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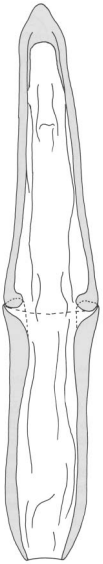

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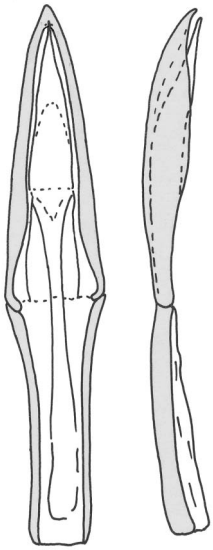

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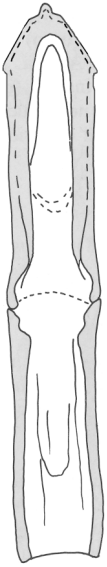

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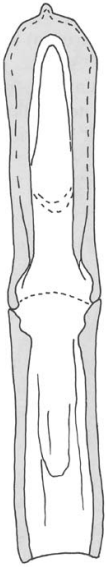

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Figs. 3–9. Aedeagal figures of Anthicidae after Bucciarelli (1980), unless stated otherwise. 3: *Anthicus angustatus* (after Bonadona, 1976). 4: *Anthicus antherinus antherinus*. 5: *Anthicus invreai*. 6: *Anthicus bimaculatus*. 7: *Anthicus flavipes flavipes*. 8: *Anthicus tristis schaumii* (orig.). 9: *Anthicus tristis tristis*. Fig. 10. *Cordicollis instabilis instabilis*, male right hand leg.

aberrations are excluded from the International Commission on Zoological Nomenclature (Article 1.3.4.) (ICZN, 1999) it was important to verify the status of this form. The type series of two specimens (label data below) was examined and found to be conspecific with *Anthicus (A.) antherinus antherinus* (Linnaeus, 1760).

Label data for ab. *ireneae* Donisthorpe: Wickham Fen. 10.IX.34 [handwritten] / Type [printed, label circle, red border] / H. Donisthorpe. B. M. 1934-4. [printed]; 1 specimen – HEADCORN Kent. 30.VIII.41 A. M. Massee [handwritten] / A. M. Massee Coll. B. M. 1967–638. Data under card [printed] x1; HEADCORN Kent. 30.VIII.41 A. M. Massee [handwritten] / A. M. Massee Coll. B. M. 1967–638. Data under card [printed] / antherinus ab. ireneae [handwritten] x1.

Anthicus bimaculatus (Illiger) Plate 6d, Fig. 6

Description: Length 2.95–4.10 mm. Dorsum yellow to light yellowish brown with V-shaped dark transverse band behind the middle of elytra, sometimes reduced to two small macula; dorsum minutely punctate. Base of head broadly rounded, dorsally somewhat convex, with large prominent eyes, temples short and rounded. Pronotum campanulate, widened anteriorly, constricted towards distinctly narrower base. Elytra dorsally convex, laterally rounded, suboval, postbasal transverse impression absent; pubescence whitish, fine and appressed. Anterior tibiae externally toothed near the apex.

Ecology and Biology: Psammophilous species of dry sandy habitats, such as dunes, sand hills, sea shores and near water bodies. Adults and larvae saprophagous. Adults are active from April to August. Listed as Notable B in Hyman (1992).

Distribution: **U.K.**: Anglesey, Cheshire, East Kent, East Norfolk, East Sussex, Glamorgan, North Devon, South Lancashire and West Norfolk. **Palaearctic**: Austria, Belarus, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Italy, Kazakhstan, Latvia, Lithuania, The Netherlands, Norway, Poland, Russia (both European & Asian), Sweden, Switzerland and Ukraine.

Anthicus flavipes flavipes (Panzer) Plate 6e, Fig. 7

Description: Length 2.00–2.70 mm. Dorsum brown to dark brown, often with indistinct dark area posteriorly, appendages somewhat paler. Head basally truncate and dorsally flattened, roughly and densely punctured, with a distinct impunctate median longitudinal area reaching vertex; eyes large, temples equal to eye length. Pronotum short and broad, slightly constricted laterally toward base, dorsally densely punctate. Elytra cylindrical, somewhat widened laterally, without postbasal transverse impression; punctures sparser than on head and pronotum; pale pubescence, of relatively dense and appressed setae. Hind wings fully-developed.

Ecology and Biology: Pine forests, forest edges and sandy places, with a preference for dry microhabitats. Adults and larvae are saprophagous. Adults are active from April to September.

Distribution. **U.K.**: Anglesey, Ayrshire, Caernarvonshire, Cheshire, Clyde Isles, Cumberland, Dunbartonshire, East Kent, Fife, Isle of Man, Midlothian, Northamptonshire, Renfrewshire, Staffordshire, South Lancashire and Stirlingshire.

Ireland: Londonderry. **Palaearctic**: Albania, Austria, Belarus, Belgium, Bosnia & Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Ireland, Italy, Kazakhstan, Latvia, Lithuania, Macedonia, Moldova, The Netherlands, Norway, Poland, Romania, Russia (both European & Asian), Slovakia, Spain (not on Canary Islands), Sweden, Switzerland, Turkey, Ukraine.

Taxonomy: The taxonomic status of *Anthicus scoticus* Rye, 1872 has long been discussed. This species is currently listed in Hyman (1992) as Red Data Book category 3 and on a number of BAP lists for the UK. Although the species was formally synonymysed with *flavipes flavipes* by Chandler, Nardi & Telnov (2004), further details are presented here.

The type series of *Anthicus scoticus*, consisting of seven specimens (label data below) is housed in the BMAG collection. After careful examination of this series it is certain that they are conspecific with *Anthicus (A.) flavipes flavipes* (Panzer, 1796), and therefore should be treated as a synonym under that species. Although the series bear the labels 'holotype' and 'paratype', these labels are in fact typical *type* labels sourced from the BMNH, and were often put on specimens during routine curation, and as such are invalid designations. In the case of *A. scoticus*, Rye (1872: 10) did not formally designate a holotype, therefore this series are syntypes (ICZN Art. 73.2). Apart from a single specimen (explained below), all the specimens bear no original Rye labels or marks, though are almost certainly part of the original series on which Rye based his description, as he states "one of my specimens seems, in certain lights, to possess a faint tendency to a dark brown humeral spot." (Rye, 1872: 11). The two associated printed labels: E. C. Rye [printed] / 4101–4107 [printed] are in fact collection labels from P. B. Mason (1842–1903), who purchased the Rye collection, which was then later purchased from Mrs. Mason by Bolton Museum (Hancock, 1985).

One specimen labelled: "Anthicus scoticus mihi M.S." [handwritten, Rye] / X [handwritten] / E. C. Rye [printed, P. B. Mason collection label] / 4105 [printed, P. B. Mason collection label] / Holo-type [printed, label circular, border red, BMNH style type label], is the best candidate, if the need arises to be designated as the lectotype, since it is the only specimen bearing any indication of type status in the hand of Rye.

Material examined: Syntype 2. [printed, label circular, yellow border, BMNH style type label: Invalid: Invalid] / E. C. Rye [printed] / 4101 [printed, P. B. Mason collection label]; Syntype 3. [printed, label circular, yellow border, BMNH style type label: Invalid] / E. C. Rye [printed, P. B. Mason collection label] / 4102 [printed, P. B. Mason collection label]; 4. [printed, label circular, yellow border, BMNH style type label: Invalid] / E. C. Rye [printed, P. B. Mason collection label] / 4103 [printed, P. B. Mason collection label]; Syntype 4 [printed, label circular, yellow border, BMNH style type label: Invalid] / E. C. Rye [printed, P. B. Mason collection label] / 4104 [printed, P. B. Mason collection label]; Syntype 5. [printed, label circular, yellow border, BMNH style type label: Invalid] / E. C. Rye [printed, P. B. Mason collection label] / 4106 [printed, P. B. Mason collection label]; Syntype 6. [printed, label circular, yellow border, BMNH style type label: Invalid] / E. C.Rye [printed, P. B. Mason collection label] / 4107 [printed, P. B. Mason collection label].

Anthicus tristis schaumii Wollaston Plate 6f, Fig. 8

Description: Length 2.30–3.00 mm. Dorsum colour variable, from nearly completely black to brown with reddish head and pronotum, elytra with often indistinct yellowish, orange or reddish spots in postbasal and postmedian area

interrupted at suture. Appendages reddish to yellowish, with femora darker than tibiae and tarsi. Head dorsally slightly convex, with dense shallow punctures; eyes small and weakly prominent; temples somewhat rounded; base of head broadly rounded. Pronotum anteriorly wider than base, converging laterally towards base. Elytra cylindrical, flattened dorsally, punctures larger and more sparse than on head and pronotum; elytra without postbasal transverse impression; humeri weakly developed; elytra with two, often indistinct bands of dense setae, the first posterior to base and entire, the second, postmedian and interrupted at the suture.

Ecology and Biology: Sea shore and sand dunes. Adults are active from March to October. This species is listed in Hyman (1992) as Red Data Book category 1 "Endangered".

Distribution. **U.K.**: Dorset, East Cornwall, Isle of Wight, South Devon and South Hampshire. **Channel Islands**: Guernsey, Herm and Jersey. **Palaearctic**: France, U.K., Morocco, Portugal (not on Azores Islands & Madeira), Spain (not in Canary Islands). Current subspecies distributed mainly along the Atlantic coast.

Notes: One completely black female individual, with only joints 2-6 of antennae pale was noted from Island of Guernsey (coll. A. Fowles). The nominative subspecies, *A. tristis tristis* W. L. E. Schmidt, 1842 (aedeagus as in Fig. 9) is widely distributed in the Palaearctic from the Atlantic coast of Europe and North Africa to the Central Asia (Uzbekistan, Turkmenistan). However, all British specimens so far examined belong to the subspecies *Anthicus tristis schaumii* Wollaston.

Genus *CORDICOLLIS* Marseul, 1879

Type species: *Anthicus instabilis* W. L. E. Schmidt, 1842

Synonyms: *Bitumicollis* Marseul, 1879; *Cordicomus* Pic, 1894 [RN]; *Laticollis* Marseul, 1879; *Laticomus* Pic, 1894.

Distribution: Palaearctic, Oriental, and Afrotropical regions.

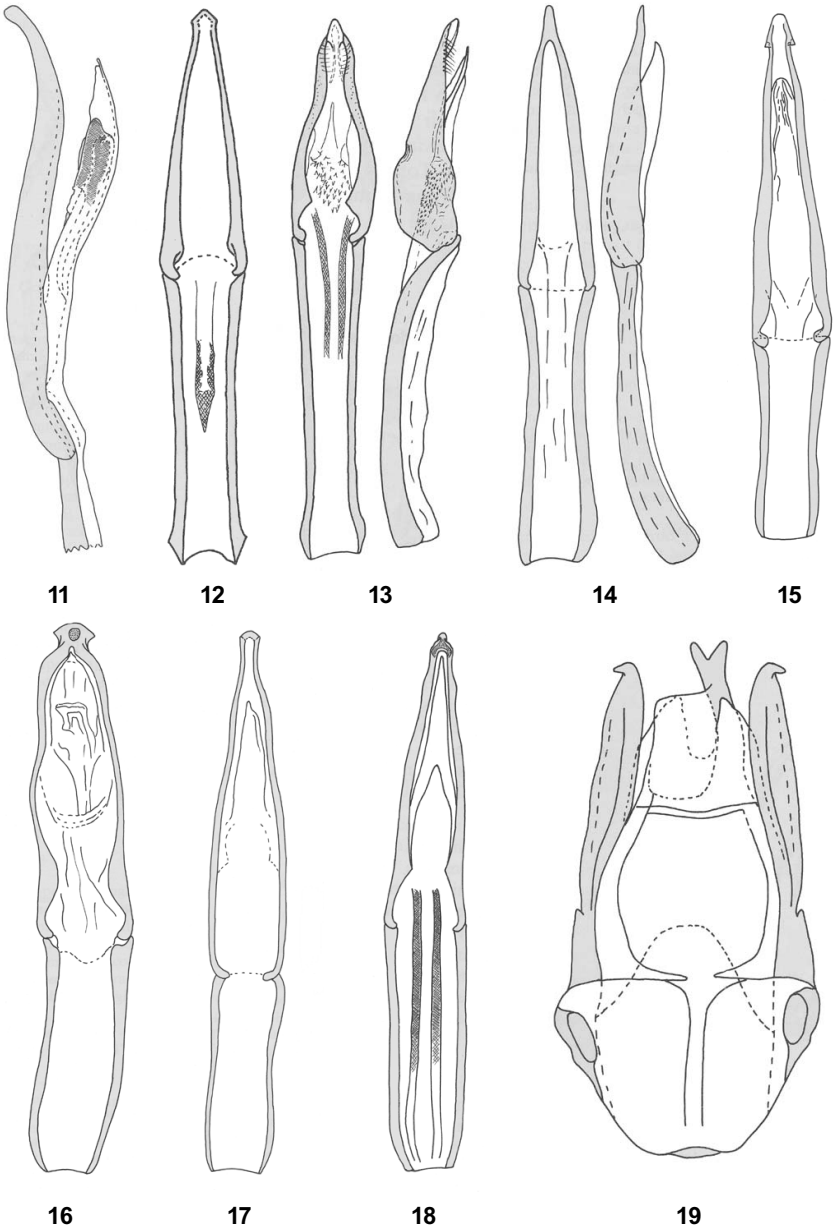
Diversity: About 80 species and subspecies, 40 of which occur in the Palaearctic region.

Cordicollis instabilis instabilis (W. L. E. Schmidt) Plate 7a, Figs. 10 & 11

Description: Length 3.00–4.30 mm. Dorsum yellowish brown to reddish brown, with or without variable darker markings on elytra. Appendages pale-yellow to reddish-brown. Head flattened dorsally, strongly and densely punctate. Eyes large and prominent, temples almost straight. Base of head broadly rounded and medially bluntly pointed. Pronotum anteriorly wider than base, laterally with shallow postmedian constriction; strongly and densely punctate on disc. Elytra subparallel, elongate; Dorsal punctures large and dense, except in apical quarter which is finely and sparsely punctate. Pubescence pale sparse and appressed. Hind wings fully developed. Male metatibiae spatulate near apex.

Ecology and Biology: Salt marshes, sandy habitats on sea shore, under beach debris. Adults and larvae saprophagous. Adults are active from April to November.

Distribution. **U.K.:** Cardiganshire, Dorset, East Kent, East Norfolk, East Suffolk, East Sussex, Isle of Wight, North Essex, South Essex, South Hampshire, West Kent, West Norfolk and West Sussex. **Palaearctic:** Algeria, Croatia, Denmark, Egypt, France, Germany, Great Britain, Greece, Italy, Libya, Malta, Morocco, Norway, Poland, Portugal (incl. Azores Islands & Madeira), Spain (excluding the Canary Islands), south of European Russia, Sweden, Switzerland, Tunisia and Ukraine.



Figs. 11–19. Aedeagal figures of Anthicidae after Bucciarelli (1980), unless stated otherwise. 11: *Cordicollis instabilis instabilis*. 12: *Cyclodinus constrictus constrictus*. 13: *Cyclodinus salinus salinus*. 14: *Hirticollis hispidus*. 15: *Omonadus bifasciatus*. 16: *Omonadus floralis*. 17: *Omonadus formicarius formicarius*. 18: *Stricticollis tobias*. 19: *Notoxus monoceros*.

Genus *CYCLODINUS* Mulsant & Rey, 1866

Type species: *Anthicus humilis* Germar, 1824

Synonyms: *Cyclodinus* Mulsant, Rey, 1866b [H]; *Lagenicollis* Marseul, 1879; *Spinicornes* Krekich-Strassoldo, 1919; *Spiniferes* Pic, 1911; *Thicanus* Casey, 1895.

Distribution: Palaearctic, Oriental, Afrotropical, Nearctic and Neotropical regions.

Diversity: About of 90 species and subspecies, of which 75 occur in the Palaearctic region.

Cyclodinus constrictus constrictus (Curtis) Plate 7b & c, Fig. 12

Description: Length 2.00–2.70 mm. Dorsum colour variable, from reddish brown to almost black, often with indistinct or completely absent pale spots in postbasal and postmedian areas of elytra; pale spots often narrowly interrupted at suture. Head slightly convex dorsally, densely punctate; eyes large, base of the head subconical, with subparallel short temples. Pronotum widened at anterior margin, laterally constricted behind the middle, with two small tubercles before narrowed base; disc densely punctate. Elytra elongate, without postbasal transverse impression, sparsely punctate. Dorsal pubescence consists of sparse, whitish, appressed setae. Hind wings fully-developed.

Ecology and Biology: Sandy microhabitats, such as sea shore, riverbanks, salt marshes. Adults and larvae saprophagous and are active from February to September. Probably all previous records of *Cyclodinus humilis* (Germar, 1824) from the British Isles refer to *C. constrictus*. The subspecies, *C. constrictus subconvexus* Rey, 1892 occurs in France. An interesting atypical specimen, being an almost completely black colour form of *C. c. constrictus* was collected on Havergate Island RSPB Reserve, East Suffolk by M. G. Telfer (Plate 7c).

Distribution. **U.K.:** Dorset, East Cornwall, East Kent, East Norfolk, East Suffolk, East Sussex, Isle of Wight, North Essex, South Devon, South Essex, South Hampshire, Surrey, West Kent, West Norfolk, West Suffolk and West Sussex. **Ireland**: Wexford. **Channel Islands**: Herm. **Palaearctic:** Algeria, Azerbaijan, Bulgaria, Croatia, Egypt, France, U.K., Greece, Ireland, Italy, Jordan, Malta, Macedonia, Morocco, Norway, Portugal (excluding Azores Islands & Madeira), Slovenia, Spain (including Canary Islands), south of European Russia, Tunisia, Turkey and Ukraine.

Cyclodinus salinus salinus (Crotch) Plate 7d, Fig. 13

Description: Length 2.20–3.00 mm. Dorsum dark brown to almost black. Antennae, tibiae and tarsi pale brown to yellowish brown. Dorsum, especially head and pronotum, densely but finely punctate. Base of head slightly elongated, medially bluntly pointed; eyes rather small. Pronotum widened at anterior margin, laterally constricted behind the middle, with two small tubercles before narrowed base. Elytra elongate, sparsely punctured, without postbasal transverse impression. Dorsal pubescence of sparse, fine, whitish, appressed setae. Hind wings fully-developed.

Ecology and Biology: Salt marshes, often in plant detritus. Adults are active from May to September. Listed as Nationally Notable A in Hyman (1992).

Distribution. **U.K.**: Dorset, East Kent, East Suffolk, Isle of Wight, North Hampshire, South Hampshire, West Kent and West Sussex. **Palaearctic:** France, Great Britain, Italy, Portugal and Spain.

Genus *HIRTICOLLIS* Marseul, 1879
Type species: *Notoxus quadriguttatus* Rossi, 1792
Synonyms: *Hirticomus* Pic, 1894 [RN].
Distribution: Palaearctic, Oriental and Afrotropical regions.
Diversity: Eight species, of which seven occur in the Palaearctic region.

Hirticollis hispidus (Rossi) Plate 7e, Fig. 14

Description: Length 2.40–3.10 mm. Dorsum glossy black, pronotum red to orange; elytra with a broad pale macula in the postbasal transverse impression; appendages yellow, yellowish-brown to reddish. Dorsum large and deeply punctured and covered (including femora and tibiae) with extremely long erect pubescence. Eyes large, weakly prominent. Temples parallel, base broadly rounded. Pronotum short, anteriorly slightly wider than base. Elytra subparallel, with very shallow postbasal transverse impression. Hind wings fully-developed.

Ecology and Biology: Prefers diverse open xeric habitats and sea shore, occasionally occurring in orchards. Adults and larvae are saprophagous. Adults are active from March to October.

Distribution. **Channel Islands**: Guernsey, Jersey. **Palaearctic**: Afghanistan, Albania, Armenia, Austria, Azerbaijan, Bosnia & Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Egypt, France, Germany, Greece, Hungary, Iran, Israel, Italy, Jordan, Kazakhstan, Kirghizia, Latvia, Lebanon, Malta, Macedonia, Moldova, Norway, Poland, Portugal (including Madeira, not on Azores Islands), Romania, Russia (south of European part & West Siberia), Saudi Arabia, Slovakia, Spain (including Canary Islands), Sweden, Switzerland, Syria, Tadzhikistan, Turkey, Turkmenistan, Ukraine, Uzbekistan and former Yugoslavia.

Genus *OMONADUS* Mulsant & Rey, 1866
Type species: *Meloe floralis* Linnaeus, 1758
Synonyms: *Hemantus* Casey, 1895; *Omonadus* Mulsant, Rey 1866b [H]; *Trapezicollis* Marseul, 1879; *Trapezicomus* Pic, 1894; *Trapezonotus* Sahlberg, 1913.

Distribution: Cosmopolitan.

Diversity: About 40 species and subspecies, of which 21 occur in the Palaearctic region.

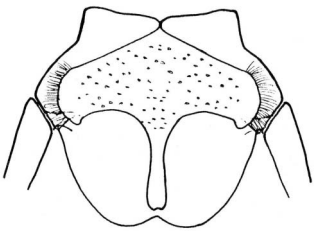


Fig. 20 *Omonadus* mesosternum (after Werner & Chandler, 1995).

Omonadus bifasciatus (Rossi) Plate 7f, Fig. 15

Description: Length 2.50–3.00 mm. Dorsum shiny, black to brown, often with indistinct pale spots in postbasal and postmedial areas of elytra, spots broadly interrupted at suture. Pronotum paler than head, pale brown or reddish. Appendages yellowish-brown to reddish, femora darker than tibia and tarsi. Head dorsally slightly convex; eyes large, weakly prominent. Temples subparallel, head base broadly rounded and slightly impressed medially. Dorsal punctures fine and sparse on head. Pronotum trapezoidal, slightly constricted laterally towards narrower base, dorsally slightly convex, pronotal punctures larger than on head. Elytra elongate, with very shallow postbasal transverse impression; punctures large in basal half, becoming smaller in apical half; pubescence whitish, short and sparse, appressed. Pubescence of sparse long and erect tactile setae on elytra, pronotum and head. Hind wings fully developed.

Ecology and Biology: Various xeric habitats. Adults are active from March to August, one record in February. Listed as Nationally Notable B in Hyman (1992).

Distribution. **U.K.**: Cambridgeshire, East Sussex, Leicestershire (with Rutland), Oxfordshire, West Norfolk, West Sussex and Warwickshire. **Palaearctic:** Afghanistan, Algeria, Armenia, Austria, Azerbaijan, Bosnia & Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, France, Georgia, Germany, Great Britain, Greece, Hungary, Iran, Israel, Italy, Kazakhstan, Kirghizia, Macedonia, Morocco, Poland, Portugal (excluding Azores Islands & Madeira), Romania, south of European Russia, Slovakia, Spain (not on Canary Islands), Sweden, Switzerland, Tunisia, Turkey, Turkmenistan, Ukraine and Uzbekistan.

Taxonomy: The type series of *Omonadus bifasciatus* ab. *dorothyae* Donisthorpe, (1935a) was examined from the collections of the Natural History Museum. London. Although aberrations are excluded from the International Commission on Zoological Nomenclature (Article 1.3.4.) (ICZN, 1999) it was important to verify the status of this form. The type specimen (label data below) was examined and found to be conspecific with *Omonadus bifasciatus* (Rossi, 1792).

Material examined: Oxford 21.VII.35 [handwritten on the card under the beetle] / Type [printed, label circle, red border] / H. Donisthorpe. B. M. 1934–4. [printed].

Omonadus floralis (Linnaeus) Plate 8a, Fig. 16

Description: Length 2.50–3.70 mm. Colour variable, dorsum reddish-brown to almost black, only pronotum and basal third of elytra reddish; appendages paler than body, femora nearly always darker than tibiae and tarsi. Head dorsally slightly convex, with minute and sparse punctures; eyes large, weakly prominent. Temples slightly widened towards the truncate base, which is medially slightly impressed. Pronotum dorsally slightly convex, medially with two small glossy tubercles on anterior margin; minutely punctate; laterally distinctly constricted towards narrowed base. Elytra elongate, slightly convex, dorsally punctures sparser, but larger than on pronotum and head; postbasal transverse impression very shallow, often almost absent. Hind wings fully-developed. Dorsal pubescence whitish, very short and sparse, appressed; short erect tactile setae very sparsely distributed over entire surface.

Ecology and Biology: Ubiquitous, saprophagous species, adults and larvae often in plant detritus, occasionally found on plants. Adults are active from March to October, some records also in December (presumably hibernating adults).

Distribution. Cosmopolitan.

U.K.: Anglesey, Bedfordshire, Berkshire, Breconshire, Buckinghamshire, Cambridgeshire, Cardiganshire, Carmarthenshire, Caernarvonshire, Cheshire, Cumberland, Denbighshire, Derbyshire, Dorset, Dumfriesshire, Durham, Easterness, East Cornwall, East Kent, East Norfolk, East Suffolk, East Sussex, Elgin, Glamorgan, Herefordshire, Hertfordshire, Huntingdonshire, Isle of Wight, Merionethshire, Middlesex, Monmouthshire, North Devon, North-East Yorkshire, North Essex, North Hampshire, North Northumberland, Oxfordshire, Pembrokeshire, Radnorshire, Shropshire, South Devon, South Essex, South Hampshire, South Lancashire, South-West Yorkshire, South Wiltshire, Surrey, Warwickshire, Westmorland, West Cornwall, West Gloucestershire, West Kent, West Norfolk, West Suffolk, West Sussex and Worcestershire. **Ireland**: Present. **Channel Islands**: Brecqhou, Guernsey, Herm and Jersey.

Omonadus formicarius formicarius (Goeze) Plate 8b, Fig. 17

Description: Length 2.70–3.70 mm. Colour variable, dorsum reddish-brown to almost black, only pronotum and basal third of elytra reddish; appendages paler than body, but femora not always darker than tibiae and tarsi. Head dorsally slightly convex, minutely, but densely punctate; eyes large, weakly prominent, temples subparallel. Pronotum dorsally slightly convex, minutely and densely punctate; laterally distinctly constricted toward narrowed base. Elytra elongate, dorsally slightly convex, punctation slightly more sparse and larger than on head and pronotum; postbasal transverse impression very shallow, often almost absent. Hind wings fully developed. Dorsal pubescence short and appressed, whitish; slightly longer erect tactile setae sparsely distributed over the entire surface.

Ecology and Biology: Ubiquitous, saprophagous species, adults and larvae often in plant detritus, occasionally on wild plants. Adults are active from March to October.

Distribution. Cosmopolitan.

U.K.: Berkshire, Caernarvonshire, Cambridgeshire, Cheshire, Cumberland, Derbyshire, Dorset, Dumfriesshire, Durham, East Kent, East Norfolk, East Suffolk, East Sussex, Elgin, Glamorgan, Herefordshire, Middlesex, Midlothian (Edinburgh), North-East Yorkshire, North Essex, North Hampshire, Northamptonshire, North Northumberland, Oxfordshire, Pembrokeshire, South Essex, South Hampshire, South Lancashire, Surrey, Warwickshire, West Gloucestershire, West Kent, West Norfolk, West Sussex and Worcestershire. **Ireland**: Present. **Channel Islands**: Guernsey and Jersey.

Genus *STRICTICOLLIS* Marseul, 1879

Type species: *Anthicus longicollis* W.L.E.Schmidt, 1842

Synonyms: *Stricticomus* Pic 1894 [RN]; *Sulcicollus* Marseul, 1879.

Distribution: Cosmopolitan.

Diversity: About 50 species and subspecies, of which 38 occur in the Palaearctic region.

Stricticollis tobias (Marseul) Plate 8c, Fig. 18

Description: Length 3.00–4.50 mm. Head, pronotum and basal third of elytra yellow to yellowish orange; elytra black in the apical two-thirds with a pair of round to oval pale spots near apical margin; appendages yellow or orange. Head dorsally

flattened, minutely but densely punctate. Eyes large, prominent; temples short, head rounded at base. Pronotum with distinct postmedian lateral transverse impression. Elytra elongate, lacking distinct postbasal transverse impression. Hind wings fully-developed. Pubescence mostly whitish or yellowish (darker on dark parts of elytra), quite long, sparse and appressed. In postbasal third of elytra, hairs directed obliquely laterally. Legs long and slender.

Ecology and Biology: Urban landscapes, often on rubbish dumps, also on sandy sea shores. Adults and larvae are saprophagous. Prefers open, sunny microhabitats. Adults are active from June to October.

Distribution. Cosmopolitan.
U.K.: Anglesey, Bedfordshire, East Norfolk, East Sussex, Hertfordshire, Leicestershire, Middlesex, South Hampshire, South Lancashire, Surrey, West Kent, West Norfolk and West Sussex [possible i].

Genus *FLOYDWERNERIUS* Telnov, 2003
Type species: *Formicomus australis* King, 1869
Distribution: Australasian region.
Diversity: Approximately ten species.

Floydwernerius australis (King)

Description: Length 2.50–2.70 mm. Body dull dark brown to black, elytra with pale yellowish to whitish postbasal and postmedian bands interrupted at suture; pronotum elongate and slightly widened anteriorly; elytral disc flattened; pubescence dense and appressed, pale brown in colour.

Ecology and Biology: Found once in a London warehouse (Richards & Herford, 1930), probably not able to survive out of doors in Britain. Imported species from Australia. No records for more than 50 years. Not included in key.

Distribution. **Australasian:** Australia (incl. Tasmania). **Palaearctic**: Great Britain [i]. **England**: London [i].

SUBFAMILY NOTOXINAE Stephens, 1829, the monoceros beetles
Distribution: Cosmopolitan.
Diversity: 7 genera, about 400 species.

Genus *NOTOXUS* Geoffroy, 1762
Type species: *Attelabus monoceros* Linnaeus, 1760
Synonyms: *Ceratoderus* Blanchard, 1845; *Monocerus* A. Villa & J. B. Villa, 1833.
Distribution: Cosmopolitan.
Diversity: About 300 species and subspecies, of which 62 occur in the Palaearctic region.

Notoxus monoceros (Linnaeus) Monoceros beetle Plate 8d & e, Fig. 19

Description: Length 4.0–5.20 mm. Upperside yellowish brown with variable black markings on elytra, usually consisting of two oval postscutellar spots, dark suture (sometimes connected with postscutellar spots), two oval lateral spots in basal third and one pre-apical transverse band with posterior margin deeply emarginate along the suture; elytra sometimes nearly complete black or with black markings reduced. Head with large prominent eyes, covered by anterior part of pronotum. Pronotum

globose. Pronotal horn long, laterally strongly dentate (Fig. 1). Elytra elongate, densely punctate. Elytral apices notched in males. Hind wings fully-developed. Pubescence long and dense, but appressed, pubescence white or yellowish on pale surface, black on dark surface. Numerous long erect to semi-erect tactile setae over entire surface.

Ecology & Biology: Open areas (meadows, fields, sea shore and near water bodies, forest edges, wasteland etc.), most often on sandy ground. Adults mainly saprophagous, but also a facultative anthophilous species, found on Brassicaceae and also *Rumex* spp. (Polygonaceae). Canthariphilous species which has been observed feeding on secretions of adult Meloidae and Oedemeridae (Fig. 21) in order to obtain and sequester cantharidin (Schültz & Dettner, 1992). Larvae in sandy soil, saprophagous. Adults are active from April to October. In U.K. a frequent colour form with elytra completely black with pale apices and sometimes the epipleura (Plate 8e) is regarded as uncommon on the continental mainland.

Distribution. **U.K.**: Anglesey, Berkshire, Caernarvonshire, Cardiganshire, Carmarthenshire, Cheshire, Cumberland, Denbighshire, East Kent, East Norfolk, East Suffolk, East Sussex, Flintshire, Glamorgan, Isle of Wight, Merionethshire, Midlothian, Monmouthshire, North Devon, North Essex, North Hampshire, North Northumberland, North Somerset, Oxfordshire, Pembrokeshire, Radnorshire, South Essex, South Hampshire, South Lancashire, Surrey, West Cornwall, West Norfolk, West Suffolk and West Sussex. **Channel Islands**: Alderney, Guernsey, Herm and Jersey. **Afrotropical:** Republic of South Africa. **Oriental:** India. **Palaearctic:** Albania, Austria, Belarus, Belgium, Bosnia & Herzegovina, Bulgaria, China (North, East and North-West provinces), Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, U.K., Italy, Kirghizia, Kazakhstan, Latvia, Lithuania, Macedonia, Moldova, Mongolia, The Netherlands, North Korea, Norway, Poland, Portugal (excluding Azores Islands & Madeira), Romania, Russia (both European & Asian), Slovakia, Slovenia, South Korea, Spain (excluding Canary Islands), Sweden, Switzerland, Turkey, Turkmenistan, Ukraine, Uzbekistan and Yugoslavia.

Fig. 21. Individuals of *Notoxus monoceros* clambering over a *Meloe* sp. adult.

Notoxus numidicus (Lucas)

Description: Length 3.30–3.50 mm. Upperside black and shiny, elytra with two very broad yellowish to orange bands in postbasal and postmedian areas, the anterior band is broader, the posterior can also be narrowly interrupted on suture.

Ecology and Biology: Within its native range this species occurs on sandy soils, mainly in coastal and dune zones of the Atlantic and Mediterranean regions. The single British record is from May. Probably an accidentally imported species from South Mediterranean region. The single British example was found in the collections of the Natural History Museum, London and bore the data: Berrow Nr. Burnham Somerset 10.v.65 / On coastal dunes / Notoxus monoceros (Linn.) R. O. Clarke / R. O. S. Clarke B. M. 1970–374. Not included in key.

Distribution. **England**: Somerset [i]. **Palaearctic**: Algeria, Egypt, Great Britain [i], Israel, Libya, Morocco, Syria and Tunisia.

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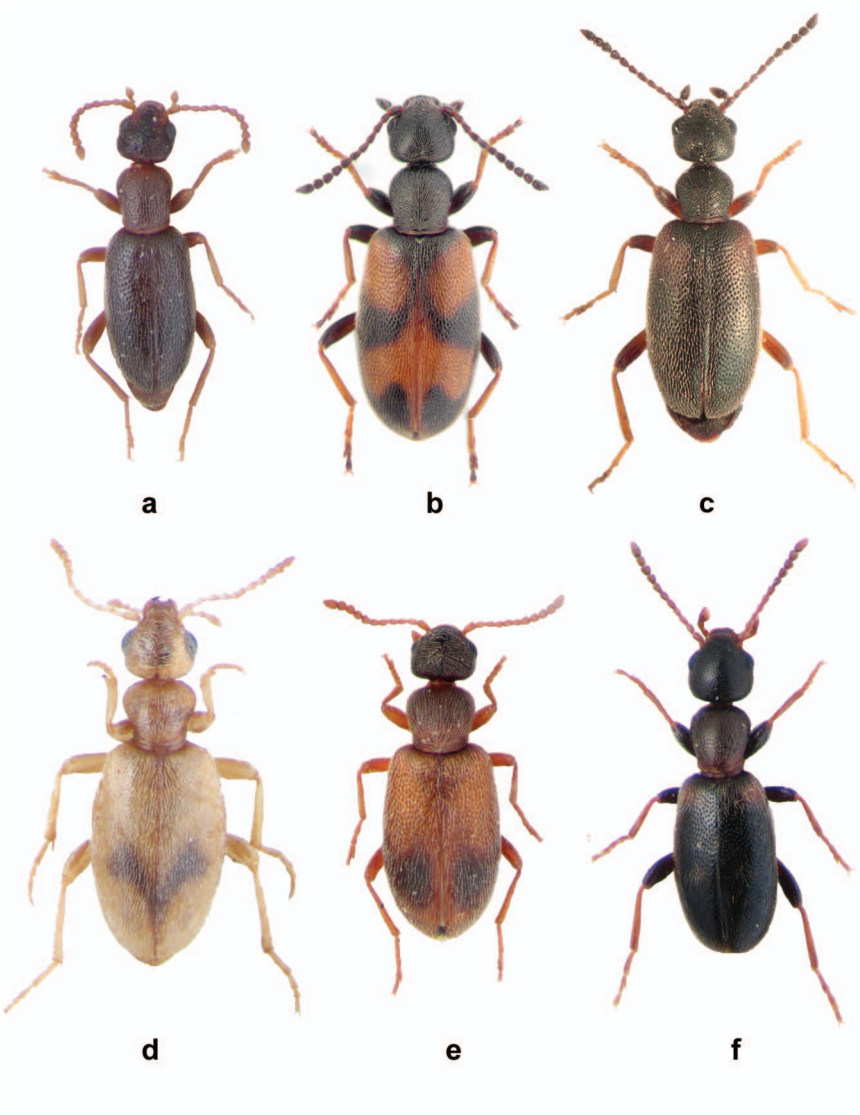


PLATE 6
a: *Anthicus angustatus* 2.4–2.7 mm. b: *Anthicus antherinus antherinus* (typical form). c: *Anthicus antherinus antherinus* (dark form) 2.80–3.65 mm. d: *Anthicus bimaculatus* 2.95–4.10 mm. e: *Anthicus flavipes flavipes* 2.0–2.7 mm. f: *Anthicus tristis schaumii* 2.3–3.0 mm.

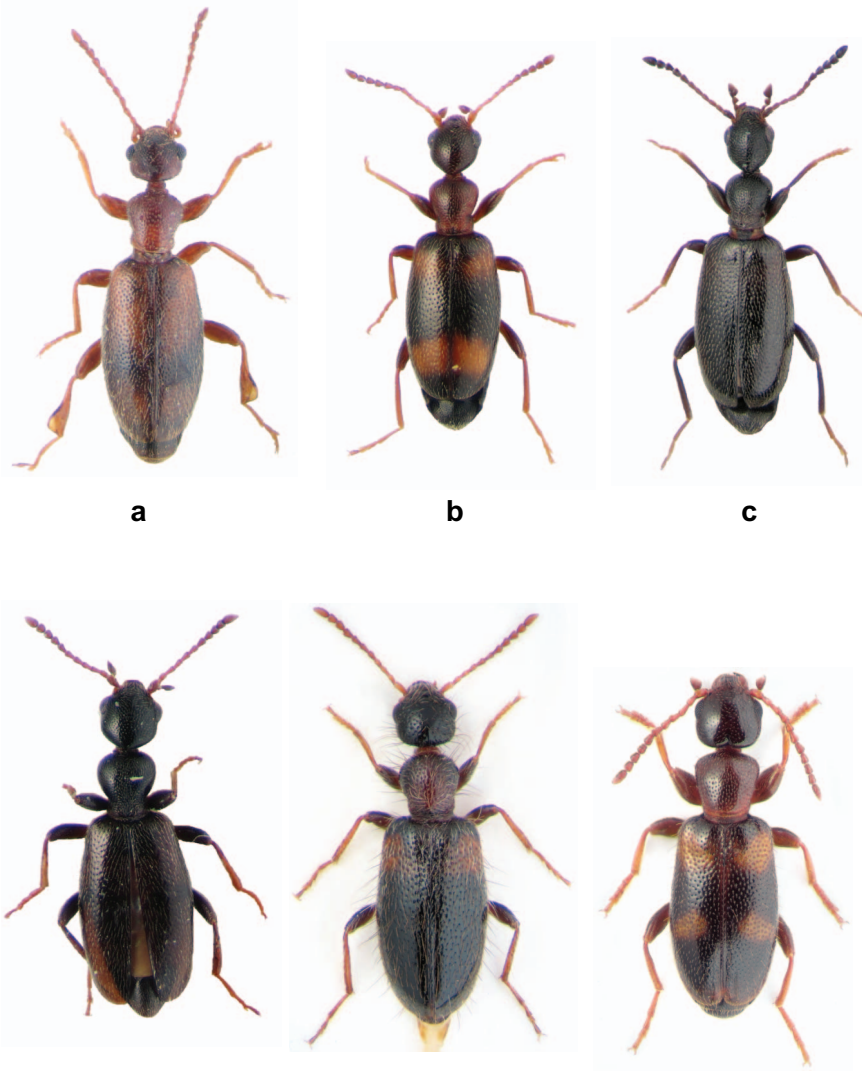
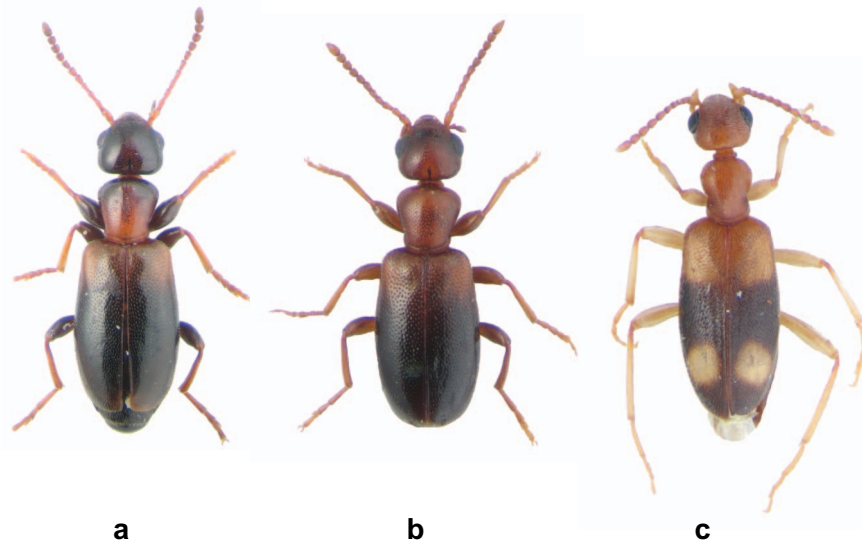


PLATE 7
a: *Cordicollis instabilis instabilis* 3.0–4.3 mm. b: *Cyclodinus constrictus constrictus* (typical form) 2.0–2.7 mm. c: *Cyclodinus constrictus constrictus* (dark form) 2.0–2.7 mm. d: *Cyclodinus salinus salinus* 2.2–3.0 mm. e: *Hirticollis hispidus* 2.4–3.1 mm. f: *Omonadus bifasciatus* 2.5–3.0 mm



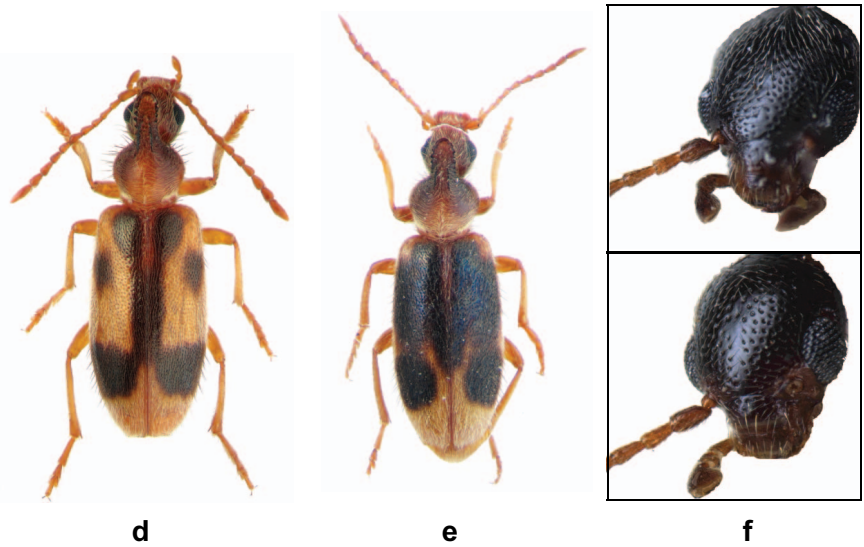


PLATE 8

a: *Omonadus floralis* 2.5–3.7 mm. b: *Omonadus formicarius formicarius* 2.7–3.7 mm. c: *Stricticollis tobias* 3.0–4.5 mm. d: *Notoxus monoceros* (typical form) 4.0–5.2 mm. e: *Notoxus monoceros* (dark form) 4.0–5.2 mm. f: Puncturation of dorsal head and two basal antennomeres of *Cyclodinus salinus salinus* (upper) and *Cyclodinus constrictus constrictus* (lower).