An Introduction to the Identification of the Woodlice (Isopoda: Oniscidea) occurring in Berkshire, Buckinghamshire and Oxfordshire

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Summary

Woodlice are familiar to all, always a popular find during family bug-hunts and widely represented in modern culture (Chater 1988).

They are Crustaceans, more closely allied to shrimps and crabs, than to the better known insects. Belonging to Order Isopoda, meaning 'equal feet', their seven pairs of more or less identical walking legs is a diagnostic character of the group (Figure 2). Most Isopods are marine and woodlice (Sub-order Oniscidea) are the only group to have successfully colonised 'dry land'. Many British species still occupy coastal sites or damp habitats inland, though a few, such as the pill-woodlice (*Armadillidium* spp.), are able to be active in full sun.

Steve Gregory is the organiser of the British Non-marine Isopod Recording Scheme.

Figure 1. Author hand searching for litter-dwelling invertebrates on the Isle of Wight. Photo by Helen Read.

Introduction

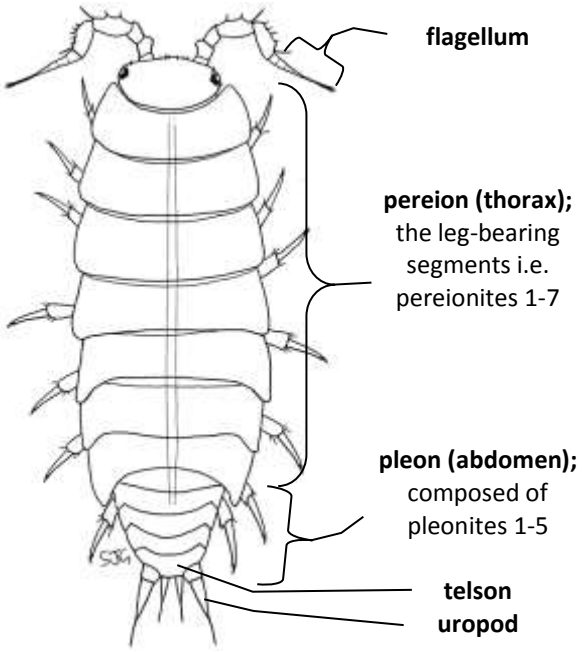

Figure 2: *Trichoniscus* sp. showing main features used for field identification

Woodlice are detritivores and play an underappreciated but very significant contribution to decomposition and nutrient recycling. They chew decaying vegetation into small pieces (comminution) allowing rapid colonisation and decomposition by bacteria and micro-fungi and thereby indirectly speeding up the recycling of nutrients back into the soil for new vegetative growth (Hassall *et al*. 1987).

Of the 40 species native or naturalised in Britain (Gregory 2009), 27 species have been recorded from Berkshire, Buckinghamshire and Oxfordshire (Table 1). Five species, Common Pygmy Woodlouse (*Trichoniscus pusillus* agg.), Shiny Woodlouse (*Oniscus asellus)*, Striped Woodlouse (*Philoscia muscorum)*, Rough Woodlouse (*Porcellio scaber)* and Common Pill Woodlouse (*Armadillidium vulgare)*, have proved to be very common throughout the three counties. These are known as the 'famous five' (Hopkin 1991).

Woodlice recording in the three counties

Figure 3. Ligidium hypnorum Carr Slater (to 9mm). Photo by Keith Lugg.

Although woodlice are an accessible group of animals to study, they have never been as popular as many insect groups. In Oxfordshire the earliest records date back to 1868 (Salzman 1938), but it was not until the late 1980s that county-wide recording began in earnest. The late Steve Hopkin and David Bilton (both past organisers of the Woodlouse Recording Scheme) and the author independently made many excursions into the three counties. In this period three species, *Haplophthalmus montivagus, Trichoniscoides helveticus* and *Metatrichoniscoides leydigii* were added to the British list (Hopkin 1991). In addition, John Campbell collected systematically across the entire length and breadth of Oxfordshire. The results of the Oxfordshire surveys are summarised in a distribution atlas (Gregory & Campbell 1995). In the subsequent two decades recording has been very sparse, and our present knowledge of the status and distribution of woodlice within the three counties remains patchy, and in need of updating.

Woodlice are taxonomically split into three main groups (or Sections); Diplocheta, Synocheta and Crinocheta. The primitive Diplocheta (Family Ligidiidae) are confined to humid habitats, with a single representative, *Ligidium hypnorum*, occurring inland. The Synocheta includes 11 species in our area (Table 1), mainly within the family Trichoniscidae. These are the soil dwelling Pygmy Woodlice, most just 2-4mm in length. The more highly evolved Crinocheta, represented by 15 species within eight families (Table 1), are mainly larger woodlice about 9-20mm in length. These include familiar species such as Shiny Woodlouse (*Oniscus asellus)* and Pill Woodlouse (*Armadillidium vulgare)*.

An additional four ‘tropical’ species have been accidentally introduced into the three counties and are confined to artificially heated glasshouses; *Cordioniscus stebbingi*, *Styloniscus mauritiensis* (both Styloniscidae), *Trichorhina tomentosa* (Platyarthridae) and *Reductoniscus costulatus* (Armadillidae). These four species are not considered further within this paper.

Although they can be found all year, woodlice are considerably easier to find in autumn and spring, when conditions are damp, but mild. In addition to turning over logs and stones, sorting through leaf-litter and moss can be productive and a few species favour walls and compost heaps.

Details of survey techniques for recording woodlice is beyond the scope of this paper, but information is available from the website of the British Myriapod & Isopod Group (BMIG); www.bmig.org.uk/page/collecting-woodlice.

British Myriapod and Isopod Group (BMIG)

BMIG is an organisation open to anyone interested in the study, recording and conservation of British and Irish woodlice, millipedes and centipedes. The BMIG newsletter is produced twice a year and the more formal Bulletin is published annually, both available online (www.bmig.org.uk; via the 'resources tab'). An annual field meeting is held in spring, to which all are welcome, beginners and experts alike.

BMIG co-ordinates the Non-marine Isopod Recording Scheme (i.e. woodlice and waterlice) and is able to confirm the identification of specimens (and where possible, images) if required. More details at: http://www.bmig.org.uk/page/woodlice-waterlice-recording-scheme, Recorders are encouraged to submit records via iRecord (https://www.brc.ac.uk/irecord), a website for sharing wildlife observations, including associated photos that allow species records to be verified by the national recording scheme organiser and thereby imported into the BMIG national dataset.

Table 1. List of native and naturalised woodlice (Isopoda: Oniscidea) recorded from, and their local abundance within, the counties of Berkshire, Buckinghamshire and Oxfordshire

A = abundant; C = common; F = frequent; L= local; R = rare; VR = very rare; Nat. = Nationally

Nomenclature follows the current World List of Marine, Freshwater and Terrestrial Isopod Crustaceans (invertebrates.si.edu/isopod). GB Status follows Lee (2015).

Family and Species	Common Name	Berks	Bucks	Oxon	GB status
Section DIPLOCHETA					
Family Ligidiidae					
Ligidium hypnorum	Carr Slater	L	L	L	Local
Section SYNOCHETA					
Family Trichoniscidae					
Androniscus dentiger	Rosy Woodlouse	F	F	F	Common
Haplophthalmus danicus	Spurred Ridgeback	F	F	F	Local
Haplophthalmus mengii	Menge's Ridgeback	L	L	L	Local
Haplophthalmus montivagus	Southern Ridgeback			R	Nat. Scarce
Metatrichoniscoides leydigii				VR	Nat. Rare
Trichoniscoides albidus	Rough Pygmy Woodlouse	L	L	L	Local
Trichoniscoides helveticus	Swiss Red-eye		R	R	Nat. Scarce

Trichoniscus provisorius	Common Pygmy Woodlouse	A	A	A	Common
Trichoniscus pusillus	Common Pygmy Woodlouse	A	A	A	Common
Trichoniscus pygmaeus	Least Pygmy Woodlouse	F	F	F	Common
Family Buddelundiellidae					
Buddelundiella cataractae	Pill Pygmy Woodlouse			VR	Nat. Rare
Section CRINOCHETA					
Family Philosciidae					
Philoscia muscorum	Striped Woodlouse	A	A	A	Common
Family Platyarthridae					
P*latyarthrus hoffmannseggii*	Ant Woodlouse	C	C	C	Local
Family Oniscidae					
Oniscus asellus ssp. asellus	Shiny Woodlouse	A	A	A	Common
Oniscus asellus x occidentalis	Hybrid Shiny Woodlouse			R	Local
Family Porcellionidae					
Porcellio dilatatus		L	L	L	Local
Porcellio laevis				VR	Nat. Scarce
Porcellio scaber	Rough Woodlouse	A	A	A	Common
Porcellio spinicornis	Painted Woodlouse	F	F	F	Common
Porcellionides pruinosus	Plum Woodlouse	F	F	F	Common
Family Trachelipodidae					
Trachelipus rathkii	Rathke's Woodlouse	L	L	L	Local
Family Cylisticidae					
Cylisticus convexus	False Pill Woodlouse		R	R	Local
Family Armadillidiidae					
Armadillidium depressum	Southern Pill Woodlouse	L	L	L	Local
Armadillidium nasatum	Striped Pill Woodlouse	R	R	R	Local
Armadillidium pulchellum	Beautiful Pill Woodlouse	R			Local
Armadillidium vulgare	Common Pill Woodlouse	C	C	C	Common

Key to the native and naturalised woodlice (Isopoda: Oniscidea) occurring in Berkshire, Buckinghamshire and Oxfordshire.

The following keys are intended to facilitate the identification of woodlice known to occur within the three counties. With experience most woodlice (including juveniles) can readily be identified in the field. The main characters used for the identification of woodlice are shown in Figures 2, 4, 5 and 14. These features are best seen in living dry animals, ideally using a binocular microscope, but a good quality handlens (10x or

20x) will suffice. Published keys, such as Hopkin (1991) or Oliver & Meechan (1993) will provide more detailed information.

A character used frequently in the identification of woodlice is the pereion-pleon outline. The pereion is the seven leg bearing body segments that lie behind the head, whereas the pleon is the 'legless' five segments towards the rear (Figure 2). In some woodlice the pereion and pleon are the same width where they meet (as in Figures 5g & 14f). In this case the pereion-pleon outline is 'continuous' or 'smooth'. In other woodlice the rear leg-less pleon is much narrower than the front leg-bearing pereion, resulting in a noticeable step to the body outline (as in Figures 2 & 5e to f). This is a 'stepped' or 'discontinuous' pereion-pleon outline.

Key A (Table 2) will allocate your specimen to one of the three taxonomic Sections. Keys B and C (tables 3 & 4) provide identification to genera, which in many cases are represented by just a single species within the three counties. For those genera that comprise several species, i.e. *Haplophthalmus*, *Trichoniscus*, *Porcellio* and *Armadillidium*, a traditional dichotomous key is then provided to species identification.

Two difficult species pairs, *Trichoniscus pusillus/provisorius* and *Haplophthalmus mengii/montivagus*, require dissection and microscopic examination of a male specimen for species identification and are not separated in the keys. Always check the identification derived from the keys against the species account and assume that the specimen is more likely to be a common species unless there are clear features that suggest otherwise. The author is willing to examine specimens or images for confirmation. Additional information about each woodlouse species, including UK distribution and colour images of live animals, can be found on the BMIG website: http://www.bmig.org.uk/checklist/woodlice-waterlice-checklist.

KEY A: Key to the main woodlouse groups

The principle feature for separating the main woodlouse groups is the number and shape of segments forming the flagellum (i.e. the end section of the antenna; see Figure 2, Figures 4a to d).

Table 2. Key A: Tabular key to main woodlice groups occurring in the three counties

Antennal flagellum	Eyes	Body length	Taxa
more than 10 bead-like segments (Figure 4a)	very large, more than 100 dark ocelli	medium, max 9mm	**Section Diplocheta:** ***Ligidium hypnorum***
tapered cone, with terminal bristle (Figure 4b)	small, 1 or 3 ocelli, or absent (Figures 5a to c)	small, 2-6mm (Pygmy Woodlice)	**Section Synocheta** 11 species; **KEY B**
2 or 3 distinct segments (Figures 4c to d)	large, up to 30 dark ocelli (Figures 14g to i)*	mostly large, 9-20mm*	**Section Crinocheta** 15 species; **KEY C**

* Except Ant Woodlouse (*Platyarthrus hoffmannseggii*) in which eyes are absent and it has a maximum length of 5mm (Figure 14f); a distinctive white species with broad oval body, stout antennae and always associated with ants). It is frequently mistaken for a Pygmy Woodlouse.

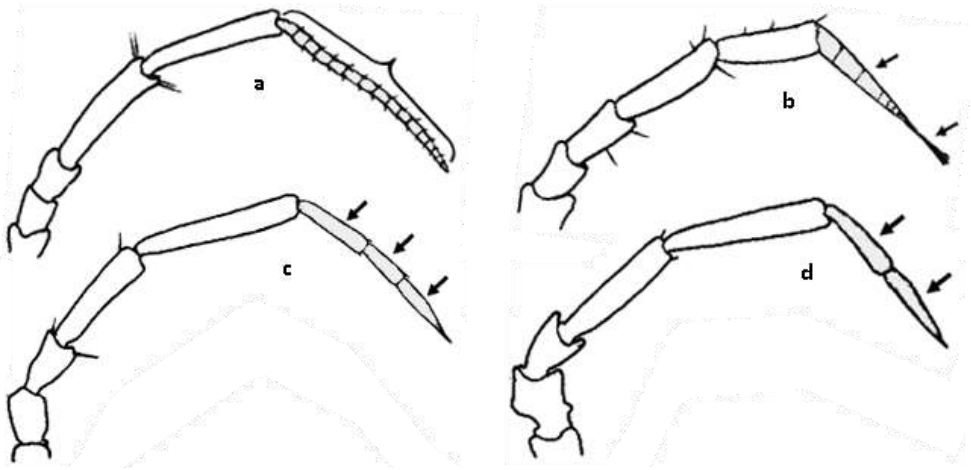

Figure 4: Examples of woodlouse antenna, highlighting antennal flagellum

a) more than ten bead-like articles
b) tapered cone with terminal brush
c) three distinct articles
d) two distinct articles

Section Diplocheta – Species account

Just one species, *Ligidium hypnorum*, occurs in the three counties.

***Ligidium hypnorum* (Cuvier, 1792) (Carr Slater)**

See Figure 3. Body (to 9mm long) mottled brown, orange and yellow, with pereion-pleon outline stepped (as in Figure 5f). It can be confused with the common *Philoscia muscorum*, but the antennal flagellum is characteristic. This local species inhabits carr woodland (e.g. Thames Valley) or ancient woodland on north facing slopes (e.g. Chiltern Hills).

KEY B – Section Synocheta

Small soil dwelling Pygmy Woodlice with antennal flagellum cone shaped (with indistinct segments) and with a distinct brush of terminal bristles (Figure 4b). The Pygmy Woodlice are mainly differentiated by the number of ocelli (simple eyes) they possess (3, 1, or none) (Figures 5a to c), their dorsal sculpturing (smooth, tuberculate or ridged) (Figures 5e to g) and pereion-pleon outline (stepped or smooth) (Figures 5f to g). The body and eye colour of the live animal are also important, but in some species pigments are rapidly lost in specimens preserved in alcohol. Thus, preserved material of *Trichoniscoides* and *Metatrichoniscoides* can only be reliably identified by dissection of a male specimen.

A tabular key to genus is presented (Table 3), which in many cases is represented by just a single species in the three counties. A traditional dichotomous key is provided for those genera, i.e. *Haplophthalmus* and *Trichoniscus*, which comprise several species.

Table 3. Key B: Tabular key to genera of section Synocheta occurring in the three counties

Number of ocelli	Live eye colour	Body sculpture	Pereion-pleon outline	Ball roller?	Live body colour	Genus/Species
absent	n/a	tuberculate	stepped	no	pure white	*Metatrichoniscoides leydigii*
one	black	ridged	continuous	no	off-white	*Haplophthalmus sp.* **Key B1**
one	brown*	tuberculate	stepped	no	reddish*	*Trichoniscoides albidus*
one	pink/red*	tuberculate	stepped	no	off-white*	*Trichoniscoides helveticus*
one	black	tuberculate	stepped	no	orange or pink*	*Androniscus dentiger*
three	black	smooth	stepped	no	reddish or pale	*Trichoniscus sp.* **Key B2**

*eye and/or body pigments that fade rapidly upon preservation in alcohol

Key B1 – Key to *Haplophthalmus* species

1. Dorsal longitudinal ridges well defined (as in Figure 5g), with each bearing 5-6 small teeth on the dorsal surface (view from side). Third pleonite with a pair of prominent raised projections on dorsal surface (Figure 5h) ***Haplophthalmus mengii/montivagus* aggregate**
   Dorsal longitudinal ridges more obscure, each bearing 3-4 small teeth. Lacking pair of raised projections on dorsal surface of second pleonite ***Haplophthalmus danicus* (Spurred Ridgeback)**

Key B2 – Key to *Trichoniscus* species

1. Body darkly pigmented, reddish brown (rarely purple). Head pigmentation matches that of body even in immatures. Larger, to 5mm ***Trichoniscus pusillus* agg. (Common Pygmy Woodlouse)**
   Body feebly pigmented, off-white, yellowish/orange or pale brown. Head noticeably paler than body. Smaller, to 3mm ***Trichoniscus pygmaeus*** (**Least Pygmy Woodlouse**)

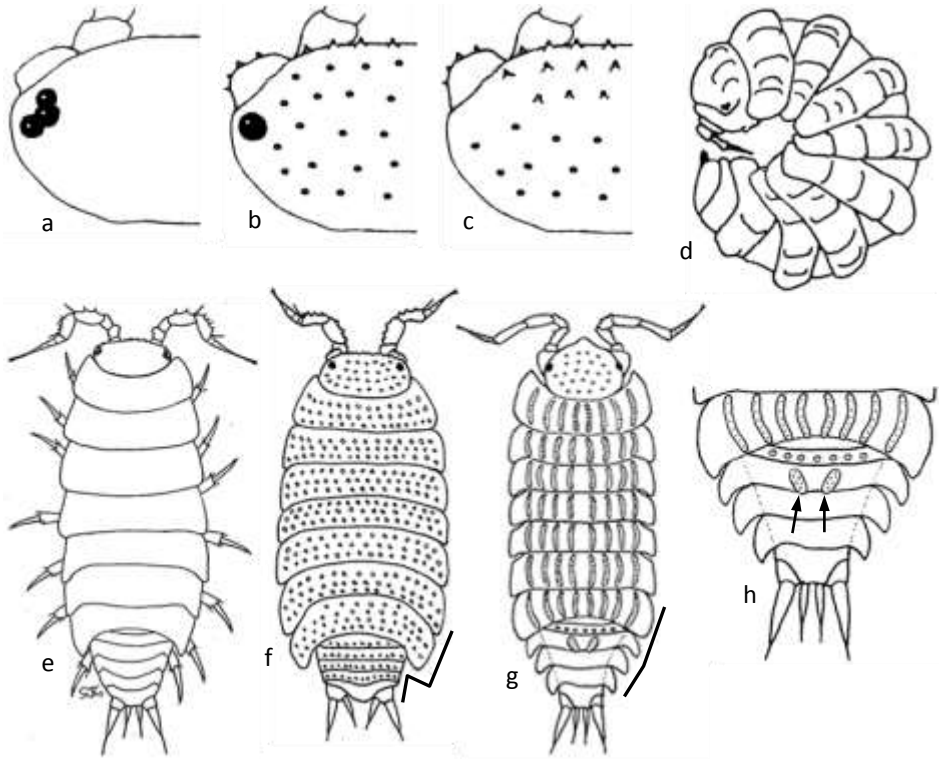

Figure 5. Characters used to identify woodlice of Pygmy Woodlice, Section Synocheta

a) eye comprising three ocelli
b) single ocellus
c) eye absent
d) *Buddelundiella cateractae*, habitus
e) smooth dorsal surface bumps
f) tuberculate dorsal surface and stepped pereion-pleon outline
g) longitudinal ridges and smooth pereion-pleon outline
h) *Haplophthalmus mengii* showing prominent (arrowed) on pleon.

Section Synocheta – Species accounts

Family Trichoniscidae

***Androniscus dentiger* Verhoeff, 1908 (Rosy Woodlouse)**

Figure 6. *Androniscus dentiger* Rosy Woodlouse (to 6mm). Photo by Keith Lugg.

To 6mm long. Typically bright orange or salmon pink in life, rarely reddish, but always with a thin yellow central stripe. Body covered with distinct coarse body tubercles (Figure 5f) and single black ocellus (Figure 5b). Pigments fade to off-white when preserved in alcohol. Immatures may be mistaken for *Trichoniscoides helveticus.* Rosy Woodlouse is frequent across our area and favours synanthropic sites including churchyards, gardens, waste ground and farmyards.

***Haplophthalmus danicus* Budde-Lund, 1880 (Spurred Ridgeback)**

Figure 7. *Haplophthalmus danicus* Spurred Ridgeback (to 4mm). Photo by Keith Lugg

Haplophthalmus are small off-white to buff species (to 4mm). The longitudinal dorsal ridges and continuous pereion-pleon outline (Figure 5g) are characteristic of the genus, but the ridges are much less distinct in *H. danicus*. It is widespread in the three counties, typically associated with damp well-vegetated habitats, such as damp woodland, farmyards, churchyards and gardens.

***Haplophthalmus mengii* (Zaddach, 1844) (Menge's Ridgback)** and ***Haplophthalmus montivagus* Verhoeff, 1941 (Southern Ridgeback)**

Figure 8. *Haplophthalmus mengii* Menge's Ridgback (to 4mm). Photo by Keith Lugg.

These two species can only be distinguished by dissection of male specimens. Both bear distinct longitudinal dorsal ridges (Figure 5g) and have a distinct pair of dorsal projections on the third pleonite (Figure 5h). *H. mengii* inhabits a wide range of semi-natural and synanthropic habitats, whereas the rare *H. montivagus* favours ancient deciduous woodland on calcareous soils.

Metatrichoniscoides leydigii (Weber, 1880)

A very small and very elusive woodlouse (to 2.5mm) entirely lacking pigment and ocelli (Figure 5c) and with the body covered in coarse tubercles (Figure 5f). Identification of preserved specimens of this and *Trichoniscoides* species (where pigments have been lost in alcohol) can only be undertaken by dissection of a male specimen. Discovered new to Britain as an introduction at a garden centre in Oxford in 1989 (Gregory 2009), *M. leydigii* could be found in other similar sites. It appears to be native to coastal areas in south-east England (Gregory 2012).

***Trichoniscoides albidus* (Budde-Lund, 1880) (Rough Pygmy Woodlouse)**

Figure 9. *Trichoniscoides albidus* Rough Pygmy Woodlouse (to 4mm). Photo by Keith Lugg.

This local woodlouse (to 4mm long) is similar in appearance to the ubiquitous *Trichoniscus pusillus*, but differs in having a coarsely tuberculate body surface (Figure 5f) and the eye comprising a single ocellus (Figure 5b). All eye and body pigments are rapidly lost in alcohol. It is mainly distributed along the Thames Valley, where it inhabits damp friable soils in a wide range of habitats, including wet deciduous woodland, alluvial meadows and the banks of streams and ditches.

***Trichoniscoides helveticus* (Carl, 1908) (Swiss Red-eye)**

Figure 10. *Trichoniscoides sp.* (to 4mm) (*T. helveticus* Swiss Red-eye looks similar.) Photo by Keith Lugg.

A small (to 4 mm) creamy-white woodlouse flushed with pinkish-orange. The dorsal surface is covered with weak tubercles (Figure 5f) and the eye composed of a single

pinkish-red ocellus (similar to Figure 5b). All eye and body pigments are rapidly lost in alcohol. It was first recognised from Wytham Woods, Oxford, and subsequently found from a handful of localities in our area, but is likely to be considerably under-recorded. Semi-natural habitats with friable calcareous soils are favoured, including grassland, scrub and deciduous woodland.

Trichoniscoides sarsi Patience, 1908 (Sar's Red-eye) might be found in the three counties. It is identical in appearance to *T. helveticus* (only males can be identified). It occurs across eastern England and into the Midlands in synanthropic habitats such as churchyards and gardens. Reliable identification requires microscopic examination of a male specimen.

***Trichoniscus pusillus* agg. Brandt, 1833 (Common Pygmy Woodlouse)**

Figure 11. *Trichoniscus pusillus* Common Pygmy Woodlouse (to 5mm). Photo by Keith Lugg.

This aggregate comprises two closely related and morphologically identical species; *T. pusillus s.str*. and *T. provisorius*. Both are small purplish-reddish species (to 4.5mm long) with eyes composed of three ocelli (Figure 5a) and a smooth body surface (Figure 5e). Although it is possible to distinguish male specimens, it is usual to simply record them as '*T. pusillus* agg.'. Both species are very common throughout our area, often numerous under stones and dead wood.

***Trichoniscus pygmaeus* Sars, 1899 (Least Pygmy Woodlouse)**

Figure 12. *Trichoniscus pygmaeus* Least Pygmy Woodlouse (to 3mm). Photo by Keith Lugg.

A very small woodlouse (to 2.5mm long) with a smooth body surface and eye is composed of three black ocelli (Figure 5a) (*cf Trichoniscoides helveticus* and immature *Androniscus dentiger*). It is usually pale pinkish-yellowish in colour, but the head is typically noticeably paler than the body (*cf* immature *T. pusillus* agg.). Eye and body pigments are retained in alcohol. It is frequently recorded, wherever suitable friable soils occur, such as grasslands, woodlands and churchyards, but elusive and easily over-looked.

Family Buddelundiellidae

***Buddelundiella cataractae* Verhoeff, 1930 (Pill Pygmy Woodlouse)**

Figure 13. *Buddelundiella cateractae* Pill Pygmy Woodlouse (to 3mm). Photo by Keith Lugg.

A distinctive species due to its very small size (to 3mm long), its ability to roll into a ball and the large prominent ridges covering the body (Figure 5d). It was discovered as an unintentional introduction at a garden centre in Oxford in 1989 (Gregory 2009) and could be found in other similar sites. It appears to be native to south Wales (*ibid*).

KEY C – Section Crinocheta

These tend to be the larger, more familiar, woodlice. The eye is composed of many darkly pigmented ocelli in a tight group (except the blind *Platyarthrus hoffmannseggii* – Figure 14f). The various species within this group are differentiated by a number of characters, including the ability to roll into a ball (conglobate) (Figures 14d to e), the presence (or absence) of 'pleopodal lungs' (two pairs or five pairs of white dots on the underside of the pleon, Figures 14a to b) and whether the pereion-pleon junction is smooth or stepped in outline (as in Figures 5f to g).

A tabular key to genus is presented (Table 4), which in many cases is represented by just a single species in the three counties. A traditional dichotomous key is provided for those genera, i.e. *Porcellio* and *Armadillidium*, which comprise several species.

Only two species, *Philoscia muscorum* and *Oniscus asellus*, have three flagella segments (Figure 4c) and are readily separated by their body shape. Of species with two flagella segments (Figure 4d) *Platyarthrus* is a small white woodlouse (to 5mm long) found in ant's nests (Figure 14f). Of the ball rollers only *Cylisticus convexus* (Figure 14d) has five pairs of pleopodal lungs (Figure 14b). The remainder, with two pairs of pleopodal lungs (Figure 14a), are *Armadillidium* spp. (Key C2), which are readily recognised by having truncated 'square' uropods that end flush with the end of the body (Figure 14c). In almost all other woodlice the uropods are elongated and project posteriorly from the animal (as in Figures 2, 5e to g, 14f). Of the remaining non-ball-rollers with two flagella segments only *Porcellionides pruinosus* has a stepped pereion-pleon outline (as in Figure 5f) and only *Trachelipus rathkii* has five pairs of lungs (Figure 14b). The remainder, with two pairs of lungs (Figure 14a) and continuous pereion-pleon outline (as in Figure 5g), are *Porcellio* spp. (Key C1).

Table 4: Key C - Tabular key to genera of Section Crinocheta occurring in the three counties

Number flagella segments	Able to roll into ball?	No. pairs pleopodal lungs	Pereion-pleon outline	Type of uropod	Family	Genus / Species
three	no	none	stepped	normal	Philosciidae	*Philoscia muscorum*⋆[1]
three	no	none	continuous	normal	Oniscidae	*Oniscus asellus*
two	no	none	continuous	normal	Platyarthridae	*Platyarthrus hoffmannseggii*
two	no	two	continuous	normal	Porcellionidae	*Porcellio* sp. - **Key C1**
two	no	two	stepped	normal	Porcellionidae	*Porcellionides pruinosus*⋆[2]
two	yes	five	continuous	normal	Cylisticidae	*Cylisticus convexus*
two	no	five	continuous	normal	Trachelipodidae	*Trachelipus rathkii*
two	yes	two	continuous	'square'	Armadillidiidae	*Armadillidium* sp. - **Key C2**

*[1] *Philoscia affinis*, first recorded in UK by Segers *et al.* (2018), might occur in the three counties.

*[2] *Porcellionides cingendus* (Kinahan, 1857), recorded from Wiltshire in 2011, will key out here.

Key C1 – Key to *Porcellio* species

1. Dorsal surface smooth and glossy. In male, uropods long and slender (Figure 14k) ***Porcellio laevis***
   Dorsal surface bearing tubercles to a greater or lesser extent. Uropods of normal lanceolate shape (Figures 14j, 14l) 2
2. Telson elongated into a rounded tip (Figure 14j). Body relatively broad ***Porcellio dilatatus***
   Telson with triangular tip (Figure 14l). Body relatively narrow 3
3. Body typically uniformly slate-grey. If mottled with yellow or orange then the pattern is randomly arranged. Head same colour as body ***Porcellio scaber* (Rough Woodlouse)**
   Body mottled brown, with a broad dark longitudinal stripe bordered laterally by yellow mottling. Head typically darker than body ***Porcellio spinicornis* (Painted Woodlouse)**

Key C2 – Key to *Armadillidium* species

The genus *Armadillidium* (the Pill-woodlice) is readily recognised by having truncated 'square' uropods that end flush with the end of the body (Figure 14c). It is helpful to look at the specimen head-on to determine the development of the scutellum (Figure 14g- to i) which occurs in front of the eyes between the antennae.

1. Scutellum distinctly raised above dorsal surface of head (Figure 14g to h) 2
   Scutellum not distinctly raised above dorsal surface of head (Figure 14i) 3
2. Scutellum narrow, less than one third width of head, forming a distinct 'snout-like' process projecting between the antennae (Figure 14g). Antennae remain protruding when enrolled (as Figure 14d). Body grey, often with two broad longitudinal pale stripes.
   ***Armadillidium nasatum* (Striped Pill Woodlouse)**
   Scutellum broad, more than one third width of head, much wider than tall (Figure 14h). Antennae incorporated within ball when enrolled. Pleonites with shallow lateral margins giving a rather flattened appearance. Body typically dark grey, sometimes with a longitudinal pattern of contrasting yellow flecks (especially in immatures).
   ***Armadillidium depressum* (Southern Pill Woodlouse)**
3. Body usually uniform slate grey, brown or pink, but there are also a wide variety of colourful mottled forms. Any pigment on edge of 7th pereionite matches that of the rest of the body.Very common ***Armadillidium vulgare* (Common Pill Woodlouse)**
   Body dark brown or black with striking yellow or greenish mottling. Edge of 7th pereionite entirely covered by a solid patch of dark pigment that contrasts rest of body (Figure 14e). Rare, on relict heathland ***Armadillidium pulchellum* (Beautiful Pill Woodlouse)**

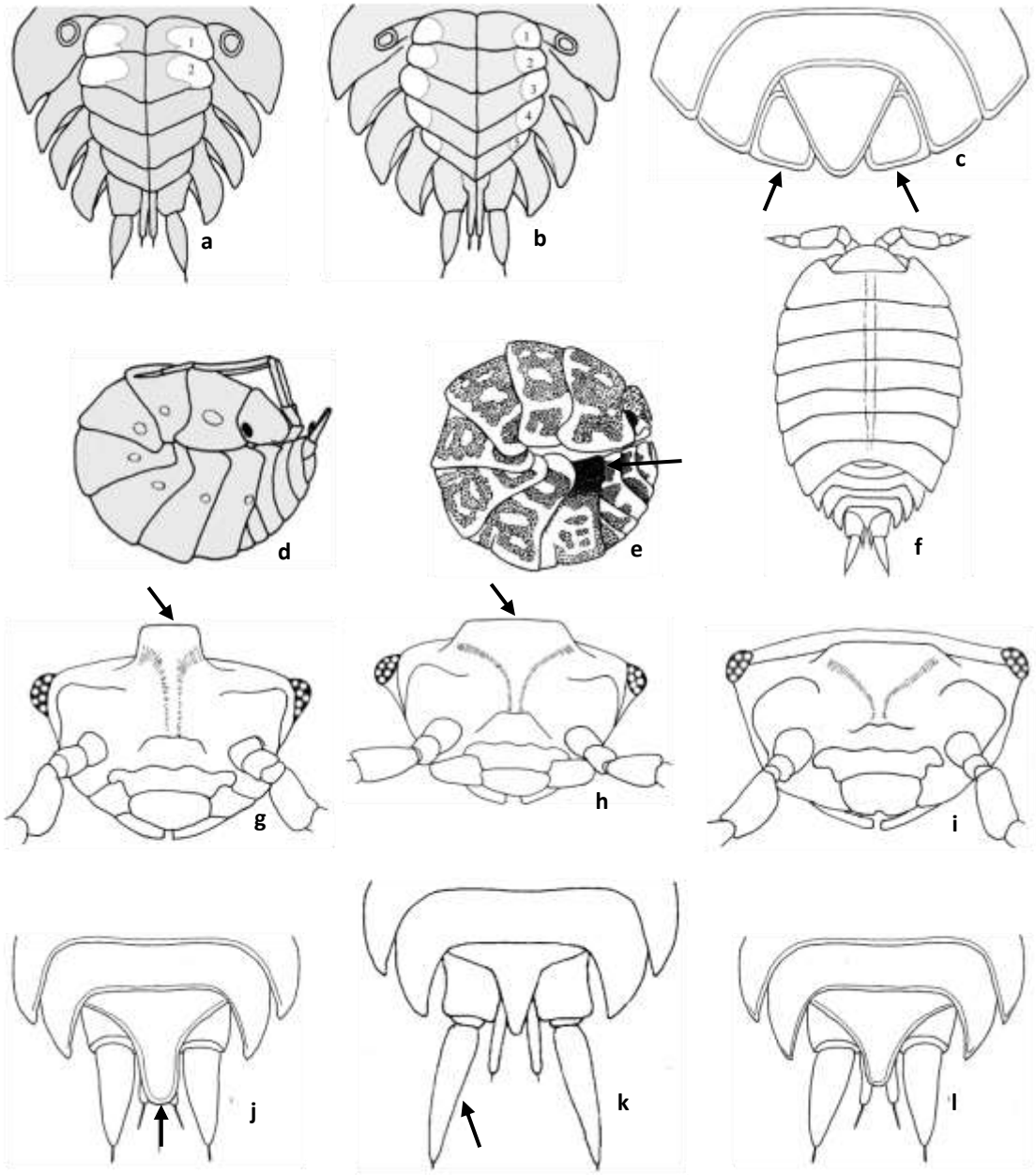

Figure 14: Characters used to identify woodlice of Section Crinocheta

a) two pairs of pleopodal lungs on underside of pleon
b) five pairs of pleopodal lungs
c) truncated uropods
d) example of a ball roller (*Cylisticus*)
e) dark patch on 7th pereionite (*A. pulchellum*)
f) *Platyarthrus hoffmannseggii*, habitus
g) face of *A. nasatum*
h) face of *A. depressum*
i) face of *A. vulgare*
j) elongated rounded telson (*P. dilatatus*)
k) elongated uropods (male *P. laevis*)
l) triangular telson (*P. scaber*)

Section CRINOCHETA – Species accounts

Family Philosciidae

***Philoscia muscorum* (Scopoli, 1763) (Striped Woodlouse)**

Figure 15. *Philoscia muscorum* Striped Woodlouse (to 11mm). Photo by Keith Lugg.

Body (to 11mm long) often brown, reddish or yellowish with head typically dark, often black with a characteristic yellow spot at the rear. A dark longitudinal stripe running the entire length of the body is usually apparent. It can be confused with *Ligidium hypnorum* or small immatures with *Androniscus dentiger*. This fast running species can be abundant in grassy habitats.

In 2017 *Philoscia affinis* Verhoeff, 1908 was discovered in southern England (Segers *et al.* 2018). It is now known from a handful of sites and might be found in our area. It lacks the dark head of *P. muscorum* and favours shady woodland (rather than open grassland).

Family Platyarthridae

***Platyarthrus hoffmannseggii* Brandt, 1833 (Ant Woodlouse)**

Figure 16. *Platyarthrus hoffmannseggii* Ant Woodlouse (to 5mm). Photo by Keith Lugg.

This small (to 5mm), blind, white woodlouse is more reminiscent of a soil dwelling Pygmy Woodlouse (Key B). However, its broad oval body, stout antennae (Figure 14f), and its association with ants, are quite characteristic of this species. It may be found wherever suitable species of ants (*Lasius, Myrmica*, etc) occur, including woodlands, grasslands and gardens.

Family Oniscidae

***Oniscus asellus* Linnaeus, 1758 (Shiny Woodlouse)**

Figure 17. *Oniscus asellus* Shiny Woodlouse (to 18mm). Photo by Keith Lugg.

This is one of our large (to 18mm) familiar woodlice. The dorsal surface is smooth and it often has a rather broad, flattened appearance. The continuous pereion-pleon outline (as in Figure 5g), three flagella segments (Figure 4c) and lack of pleopodal lungs are characteristic of *Oniscus asellus*. It is ubiquitous, but favours damper niches.

A sub-species of ancient genetic divergence, *Oniscus asellus* ssp. *occidentalis* Bilton, 1994 occurs in south-west England. This is believed to be our native 'species' (Bilton *et al*. 1999), but the two subspecies hybridise and at a few relict wetland sites in Oxfordshire the hybrids (*Oniscus asellus x occidentalis*) have been found.

Family Porcellionidae

Porcellio dilatatus Brandt, 1833

Figure 18. *Porcellio dilatatus* (to 15mm). Photo by Keith Lugg.

This large species (to 15 mm) has a pale 'dusty' grey brown coloration. It can be confused with *P. scaber* or *Oniscus asellus*, but the shape of the telson, with its elongated rounded tip (Figure 14j) is characteristic. This is a characteristic woodlouse of stables and dairy farms, often found within well-established manure heaps. It can also be found within compost heaps and inside glasshouses. For such a large species it is very under-recorded.

Porcellio laevis Latreille, 1804

Figure 19. *Porcellio laevis* male (to 20mm). Photo by Keith Lugg.

This large woodlouse (to 20 mm) differs from other *Porcellio* spp. in having a smooth dorsal surface and, in the male the uropods are greatly elongated and spear-shaped (Figure 14k). It can be confused with *Porcellio dilatatus* or even the ball-rolling *Cylisticus convexus*. Formerly associated with stables, it seems to have undergone a dramatic decline throughout the 20th century (Harding 2016). The only modern records in the three counties are from Oxford city centre (Gregory & Campbell 1995) where it occurred in compost heaps at the Botanic Gardens and within a domestic garden nearby.

***Porcellio scaber* Latreille, 1804 (Rough Woodlouse)**

Figure 20. *Porcellio scaber* Rough Woodlouse (to 17mm). Photo by Keith Lugg.

Another large (to 17mm) familiar woodlouse. Although typically uniformly slate-grey, it is not uncommon for the base of the antennae to be pale orange and numerous brightly mottled varieties are frequent. However, this pattern is random, and not arranged longitudinally, as seen in *P. spinicornis* or *Trachelipus rathkii*. It is ubiquitous, but more tolerant of drier sites than *O. asellus* and readily enters houses or climbs walls and trees.

***Porcellio spinicornis* Say, 1818 (Painted Woodlouse)**

Figure 21. *Porcellio spinicornis* Painted Woodlouse (to 12mm). Photo by Keith Lugg.

This species (to 12mm) typically has a dark, almost black, head and a dark central stripe running the full length of the body bordered by contrasting yellow mottling. This distinctive longitudinal pattern is quite unlike the random mottling seen in *P. scaber*. Confusion is, perhaps, most likely with *Oniscus asellus*, but all *Porcellio* spp. are distinguished by having two flagella segments (Figure 4d) and two pairs of pleopodal lungs (Figure 14a). This is a local species most abundant in limestone areas, where it favours dry, relatively exposed, calcareous substrates, such as drystone walls, loosely mortared walls and quarries. It frequently ventures indoors.

***Porcellionides pruinosus* (Brandt, 1833) (Plum Woodlouse)**

Figure 22. *Porcellionides pruinosus* Plum Woodlouse (to 12mm). Photo by Keith Lugg.

This species (to 12mm) has a characteristic appearance, being a uniform purplish-brown colour with a blue-grey bloom. The body colour contrasts against the long whitish legs and the pale annulations on the antennae. The body has an obviously stepped pereion-pleon outline (Figure 5). It is widely distributed across our area and can be abundant within manure heaps and compost heaps, but only rarely found away from such habitats.

Porcellionides cingendus (Kinahan, 1857) was recorded from north Wiltshire in 2011 and may be discovered in our area. It is much less likely to be found in compost heaps. This south-western species differs from *P. pruinosus* in the body being mottled in various shades of yellow, red or brown, and therefore more reminiscent of the common *Philoscia muscorum*.

Figure 23. *Porcellionides cingendus* (to 9mm). Photo by Keith Lugg.

Family Trachelipodidae

***Trachelipus rathkii* (Brandt, 1833) (Rathke's Woodlouse)**

Figure 24. *Trachelipus rathkii* Rathke's Woodlouse (to 15mm). Photo by Keith Lugg.

This large woodlouse (to 15mm) is typically slate-grey in colour with three thin longitudinal stripes running the length of the body. It is rather reminiscent of the ubiquitous *Porcellio scaber* and frequently confused with *Oniscus asellus*, but the five pairs of pleopodal lungs (Figure 14b), readily seen with a hand lens, are characteristic of *Trachelipus* (and the ball-rolling *Cylisticus*). It favours sites with impeded drainage, is tolerant of flooding and can be locally common along the Thames Valley, especially in riverside meadows.

Family Cylisticidae

***Cylisticus convexus* (De Geer, 1778) (False Pill Woodlouse)**

Figure 25. *Cylisticus convexus* False Pill-woodlouse (to 15mm). Photo by Keith Lugg.

This species (to 15mm long) will reluctantly roll into a flattened ball, but its long pointed uropods remain protruding (Figure 14d). This latter feature and its five pairs of pleopodal lungs (Figure 14b) readily differentiate it from *Armadillidium* spp. This is a rather rare species in the three counties where it inhabits disturbed sites such as railway sidings and embankments, disused quarries and farmyards.

Family Armadillidiidae

***Armadillidium depressum* Brandt, 1833 (Southern Pill Woodlouse)**

Figure 26. *Armadillidium depressum* Southern Pill Woodlouse (to 20mm). Photo by Keith Lugg.

This large pill-woodlouse (to 20mm) is very similar in appearance to the common *A. vulgare*. In addition to the raised scutellum (Figure 14h), it differs in the edges of the pleon being more curved outwards, giving a 'splayed' or slightly ‘squashed’ appearance. It is locally distributed, with a distinct western bias in the three counties. It is heavily synanthropic and typically occurs on drystone walls and loosely mortared walls in towns, villages and farmyards; sometimes found indoors.

***Armadillidium nasatum* Budde-Lund, 1885 (Striped Pill Woodlouse)**

Figure 27. *Armadillidium nasatum* Striped Pill Woodlouse (to 12mm) Photo by Keith Lugg.

Another pill-woodlouse (to 12mm) very similar in appearance to *A. vulgare*. However the narrow protruding scutellum (snout) is distinctive (Figure 14g). This seems to be a rare woodlouse in the three counties, associated with synanthropic sites in more sunny situations, such as disused limestone quarries, railway lines and garden centres (where it frequently occurs inside glasshouses).

***Armadillidium pulchellum (*Zencker, 1798) (Beautiful Pill Woodlouse)**

Figure 28. *Armadillidium pulchellum* Beautiful Pill Woodlouse (to 5mm). Photo by Keith Lugg.

This is a small (to 5mm) very attractively mottled pill-woodlouse. It can be easily confused with mottled immatures of the common *A. vulgare*, but differs in bearing a dark patch on the 7th epimera which contrasts with the paler pigmentation of the rest

of the body (Figure 14e). This species has a north-western distribution in Britain, but a few relict populations are known from heathland in south-east England, including two sites in Berkshire associated with rotten pine *Pinus* sp. It is possibly under-recorded in our area. Gregory & Richards (2008) provide a summary of characters useful in separating the two species.

***Armadillidium vulgare* (Latreille, 1804) (Common Pill Woodlouse)**

Figure 29. *Armadillidium vulgare* Common Pill Woodlouse (to 18mm). Photo by Keith Lugg.

This is the familiar pill-woodlouse (to 18mm long). It is often uniform slate grey, but can be highly variable in colour and mottling. However, it never has the well-developed ornate mottling, characteristic of *A. pulchellum*, and the 7th epimera is always the same colour as the rest of the body (*cf* Figure 14e). This is a common species in the three counties and occurs in most habitats, but favours drier sites and may be active in full sun.

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