

www.e-rara.ch

Trichoptera Britannica

McLachlan, Robert

[London], [1865]

ETH-Bibliothek Zürich

Shelf Mark: Rar 14977

Persistent Link: <https://doi.org/10.3931/e-rara-67912>

Fam. Rhyacophilidae.

www.e-rara.ch

Die Plattform e-rara.ch macht die in Schweizer Bibliotheken vorhandenen Drucke online verfügbar. Das Spektrum reicht von Büchern über Karten bis zu illustrierten Materialien – von den Anfängen des Buchdrucks bis ins 20. Jahrhundert.

e-rara.ch provides online access to rare books available in Swiss libraries. The holdings extend from books and maps to illustrated material – from the beginnings of printing to the 20th century.

e-rara.ch met en ligne des reproductions numériques d'imprimés conservés dans les bibliothèques de Suisse. L'éventail va des livres aux documents iconographiques en passant par les cartes – des débuts de l'imprimerie jusqu'au 20e siècle.

e-rara.ch mette a disposizione in rete le edizioni antiche conservate nelle biblioteche svizzere. La collezione comprende libri, carte geografiche e materiale illustrato che risalgono agli inizi della tipografia fino ad arrivare al XX secolo.

Nutzungsbedingungen Dieses Digitalisat kann kostenfrei heruntergeladen werden. Die Lizenzierungsart und die Nutzungsbedingungen sind individuell zu jedem Dokument in den Titelinformationen angegeben. Für weitere Informationen siehe auch [Link]

Terms of Use This digital copy can be downloaded free of charge. The type of licensing and the terms of use are indicated in the title information for each document individually. For further information please refer to the terms of use on [Link]

Conditions d'utilisation Ce document numérique peut être téléchargé gratuitement. Son statut juridique et ses conditions d'utilisation sont précisés dans sa notice détaillée. Pour de plus amples informations, voir [Link]

Condizioni di utilizzo Questo documento può essere scaricato gratuitamente. Il tipo di licenza e le condizioni di utilizzo sono indicate nella notizia bibliografica del singolo documento. Per ulteriori informazioni vedi anche [Link]

semilunate spot more towards the costa; fringes pale yellowish; in the female these wings are much paler and the yellowish spots are indistinct. Posterior wings smoky-grey with concolorous fringes. Legs greyish-ochreous, paler in the female. Abdomen dark blackish-fuscous, slightly paler beneath. In the male there is a long straight narrow yellow lobe from the upper margin of the last segment, the apex of which is truncated; app. sup. very small; app. inf. very long, yellow, cylindrical, the tips approximating.

Expanse of fore-wings, ♂ 6—7 lines, ♀ 9—10 lines.

A common species in many localities, frequenting canals and slowly-flowing rivers. In Ireland it is abundant near Dublin and also at Killarney. It is wanting among the Stephensian types, but exists in Curtis' Collection under the MS. name of *memorable*. This insect is very widely distributed, Dr. Hagen having even received it from the Slave Lake in North America.

Fam. RHYACOPHILIDÆ.

Antennæ moderately stout, as long as, or shorter than, the wings; ocelli generally present; maxillary palpi alike in the sexes, scarcely hairy (except in *Beræa*), the last joint usually cylindrical; anterior wings usually with but slight hairy clothing, broad and dilated towards the apex; posterior wings generally broad and folded; legs nearly spineless, but furnished with long spurs, varying in number in the different genera.

Larva elongate, decreasing in size at the extremities; head and pronotum corneous; mesonotum and metanotum of the same consistency as the abdomen; legs short; first abdominal segment without protuberances, terminal segment provided with long anal hooks; respiratory filaments arranged in tufts, or these filaments are entirely absent externally.

Pupa elongate; mandibles internally dentate; abdomen not fringed at the sides, without external respiratory filaments. It is contained in an oval cocoon within the case, the cocoon being composed of a gelatinous material which hardens into a tough membrane.

Case a fixed heap of small angular stones placed beneath a large stone. The larvæ live almost free beneath stones, retiring into the cases on the approach of danger and when about to assume the pupa state.

Most of the genera frequent swift streams.

The following is a tabular arrangement of the British genera:—

Spurs 3-4-4	<i>Rhyacophila</i> .
Spurs 2-4-4	<i>Agapetus</i> and <i>Glossosoma</i> .
Spurs 2-2-4	<i>Beræa</i> .
Spurs 0-4-4 (♂), 1-4-4 (♀) . . .	<i>Chimarra</i> .

Genus RHYACOPHILA, Pictet.

Antennæ rather shorter than the wings; basal joint thick, shorter than the head. Head nearly quadrate. Ocelli present. Maxillary palpi with the first two joints very short and nearly globular, the others cylindrical and nearly equal, the third slightly the longest. Labial palpi with two broad and dilated basal joints and a somewhat longer and thinner cylindrical terminal joint. Mesothorax short and robust. Anterior wings narrow at the base, dilated towards the elliptical apex; costal margin somewhat rounded; hairy clothing very slight; neuration strong and distinct; an oblique transverse vein uniting the costa and subcosta near the middle; radius slightly bent before its termination; discoidal cell open (in all the wings); a straight transverse vein uniting the lower branch of the ramus discoidalis to the upper branch of the ramus thyriifer, and an oblique one, placed more posteriorly, uniting the two branches of the ramus thyriifer. Posterior wings similar in form to the anterior, but somewhat shorter. Legs long; anterior tibiæ with one median and two long equal apical spurs; intermediate and posterior tibiæ each with two pairs of long and nearly equal spurs. Abdomen slender in the male, robust in the female. In the antepenultimate ventral segment in the male there is a small pointed tubercle; the upper margin of the last abdominal segment is produced into a lobe varying according to the species, sometimes very long; app. sup. small, lying under this lobe and often concealed by it; app. inf. very long and bisarticulate; penis long, furnished with two valves and with long needle-shaped sheaths on either side. In the female the extremity of the abdomen is obtuse; at the apex are seen two somewhat hairy valves fitting round a short thick tubular piece, from the interior of which the small ovipositor can be exerted at will.

Larva inhabiting swiftly-running streams; elongate, flattened; head and first thoracic segment small and corneous (see Pl. II. fig. 16); mandibles simple; two last thoracic segments and the abdomen soft; legs short and thick; abdominal segments broadly transverse, each (and also the two last thoracic segments) provided with a large tuft of respiratory filaments on each side; anal crotchets very long and claw-shaped.

Pupa long and narrow, with small head and prothorax; mandibles externally provided with one large, and several smaller teeth (see Pl. II. fig. 22); abdomen without respiratory filaments or fringes. These pupæ shortly before they assume the perfect state are very active when taken out of the cases. I have seen one walk across an ordinary-sized round table, and use every endeavour to escape. In the pupæ of the males the anal appendices are highly developed, so much so that it is often possible by this means to identify the species to which they belong.

Case an oval heap of stones into which the larva occasionally retires; the cocoon of the pupa is long and brown.

We possess four recorded species of this numerous genus, three of which are recent discoveries. There can be no doubt that more will yet be found, especially in the mountain districts of Scotland and Ireland.

A. *Terminal joint of the inferior appendices in the male not cleft.*

1. *Rhyacophila dorsalis*, Curtis.

(Pl. II. fig. 9, larva and pupa; Pl. XIV. figs. 7, 8, app.)

Philopotamus dorsalis, Curt. (*) Phil. Mag. p. 213, 6 (1834); *Rhyacophila dorsalis*, Hag. (*) Stett. Zeit. 1859, p. 153, 1; Ent. Ann. 1860, p. 79, 78; *Philopotamus longipennis*, Curt. (*) Phil. Mag. p. 213, 6 b (1834); *Rhyacophila vulgaris*, Steph. (*) Ill. p. 165, 1 (1836); *Crunophila vulgaris*, Kol. Gen. et Spec. Trichop. pt. 2, p. 196, 3, pl. 1, fig. 3?; *Rhyacophila stigma*, Steph. (*) Ill. p. 166, 2 (1836); *R. opaca*, Steph. (*) Ill. p. 166, 3 (1836).

Antennæ brown, with paler annulations. Head and thorax dark reddish-brown. Palpi brown. Anterior wings greyish-brown, thickly irrorated with small pale-yellowish spots, many of which are confluent; a large rhombic whitish spot, with darker irrorations, is placed about the middle of the dorsal margin in each wing, and when the wings are closed, these spots meet and form one very conspicuous dorsal blotch; between this spot and the base are one or two longitudinal fuscous streaks; apical margin spotted with greyish; pterostigma slightly darker; veins brown; the female is always darker, with the paler irrorations and dorsal spot less conspicuous; the coloration varies very much in different individuals. Posterior wings greyish, subhyaline, with a brownish pterostigmatic mark. Legs testaceous. Abdomen

dark brown above, ochreous beneath. In the male the lobe from the upper margin of the last segment is very long and narrow, band-like, with a dilated truncated apex; app. sup. flat and short, placed on each side of the lobe, and I am not certain but that these appendices have a moveable piece attached, concealed under the lobe; app. inf. very long, the basal joint longest, the terminal joint notched a little before the obtuse apex on the upper edge; sheaths usually curved strongly downwards; penis nearly cylindrical. In the female the valves are large and somewhat hairy, the truncated apical margins slightly excised.

Expanse of fore-wings 10—13 lines.

Larva with the head yellowish, with a blackish marking in front on each side before the eyes; an assemblage of brown spots on the middle of the disc forming a stellate marking; hinder edge notched, narrowly dark brown. Pronotum yellowish, broadly margined with brown on the hinder edge. Meso- and meta-nota and abdominal segments dull greenish when alive, the respiratory filaments pinkish. Legs yellowish, with brown spots; anal crotchets yellowish, with blackish lines.

Inhabits clear swiftly-running streams, all over the country; appearing from the end of spring till late in the autumn.

The true *R. vulgaris* of Pictet is very closely allied to this species, but appears to be distinct; nevertheless the characters are by no means striking. In *vulgaris* the penis-sheaths are always curved upwards, and the penis itself is more crooked and provided beneath with a large obtuse tooth or tubercle; but I have seen examples of *dorsalis* in which the sheaths had an upward tendency. *R. vulgaris* probably occurs here, but is overlooked.

2. *Rhyacophila obliterata*, M'Lachlan.

(Pl. I. figs. 8, 8*; Pl. VIII. fig. 6, neuration and palpi;
Pl. XIV. fig. 9, app.)

Rhyacophila obliterata, M'Lach. Ent. Ann. 1863, p. 134, fig. 7.

Antennæ brownish, with paler annulations. Head and palpi brown. Mesothorax dark reddish-fuscous. Anterior wings pale yellowish, faintly reticulated with pale grey, and with brownish-grey spots, somewhat arranged in two transverse rows; a large brownish-grey blotch, with well defined edges, placed on the dorsal margin near the base, marks the inner edge of the pale dorsal blotch; a distinct whitish hyaline dot at the thyridium; veins brown; in the female the wings are narrower and pale brown, with indistinct yellowish irrorations, the dot at the thy-

ridium more conspicuous, and the veins darker. Posterior wings subhyaline, faintly yellowish at the apex, and with the pterostigma also yellow. Legs testaceous. Abdomen fuscous above, ochreous beneath, with testaceous appendices. In the male the lobe from the middle of the upper margin of the last segment is short and very broad, almost square, but with the corners rounded, concealing the app. sup.; app. inf. very long, first joint shortest and truncated, second joint longer, broad at the base, then suddenly very obliquely excised, the apex much produced and slightly incurved; sheaths very short and straight; penis apparently dilated and notched at the end. In the female the truncated margins of the valves are rather suddenly and deeply notched.

Expanse of fore-wings 12—13 lines.

This species is common along all the mountain torrents of North Wales in September, often at considerable elevations. I have also seen examples from North Devon, Staffordshire and Scarborough.

I believe that the female described in the Ent. Ann. 1863 belonged to *R. dorsalis*; however, I met with undoubted females of *obliterata* (described above) in the autumn of 1863; they are much rarer than the males.

Of the described European species belonging to this section, *R. obliterata* is allied in form to *R. fasciata*, Hagen, of which I possess a continental example. This differs in its decidedly fasciated anterior wings, and in the form of the superior lobe, which is much longer, and does not entirely cover the app. sup.

R. vulgaris, Pict., as before mentioned, is very closely allied to *R. dorsalis*, Curtis. *R. paupera*, Hagen (which I possess from Sweden), is somewhat similar to *dorsalis* but darker, the penis-sheaths straight, the superior lobe narrow, but not dilated at the apex, and not so long as the app. sup. *R. torrentium*, Pict. (= *R. Armeniaca*, Guérin), is the largest of the European species, and differs considerably from the others. *R. ferruginea*, Scopoli, Hagen, somewhat resembles *fasciata* in the form of the appendices, and still more the next following, *R. septentrionis*, with which it may perhaps be identical.

3. *Rhyacophila septentrionis*, n. sp.

Rhyacophila ferruginea, Hag. Stett. Zeit. 1859, p. 133, 4?

Antennæ testaceous, with indistinct paler annulations. Head, palpi and mesothorax pale brown; the former with scattered golden hairs. Anterior wings broad, the apex nearly elliptical,

golden-grey, thickly reticulated with dark grey; dark greyish-fuscous spots round the apical margin, one at the termination of each apical sector; the pale dorsal blotch is ill defined, and is indicated by an irregular pale space, scarcely reticulated; a similar but still more indistinct paler space occupies the whole of the lower two-thirds of the apical portion of the wing; neuration fuscous. Posterior wings pale greyish, subhyaline; apical veins darker grey, sometimes margined with grey at their points of insertion in the apical margin. Legs testaceous; the tips of the anterior and intermediate tibiæ externally fuscous; tibial spurs dark brown. Abdomen fuscous, ochreous beneath, testaceous at the apex above, and with testaceous appendices. In the male the superior lobe is short, rather attenuated at the base, but soon greatly dilated, the apical portion being nearly orbicular; app. sup. nearly concealed under the lobe, the external edge rounded, slightly excised in front; app. inf. rather short, the basal joint broad, with the sides parallel, the apical joint scarcely shorter than the basal, and of equal breadth, the apex very obliquely truncated; penis furnished above with a short broad dark chestnut-brown superior cover; lower sheaths bent slightly downwards (their direction varies in dead specimens), dark shining chestnut-brown, clear testaceous at the extreme base.

Expanse of fore-wings $12\frac{1}{2}$ lines.

I took five examples (all males) in the middle of June, 1865, at a little stream running into the sea on the coast of the Firth of Forth, near Longniddry. The discovery was made too late for me to give figures of the appendices.

I have some doubt in announcing this as a new species, since the form of the appendices agrees very well with the figure of those of *R. ferruginea*, sent to me by Dr. Hagen. I submitted an example to that gentleman, and he says that it is larger and darker than his continental types of that species, and may be distinct. *R. ferruginea* is described as "die kleinste Art" of the group (the true genus *Rhyacophila*) to which it belongs.

B. *Terminal joint of the inferior appendices in the male cleft.*

4. *Rhyacophila munda*, M'Lachlan. (Pl. XIV. fig. 10, app.)

Rhyacophila munda, M'Lach. Trans. Ent. Soc. ser. 3, vol. i. p. 309 (1862); Ent. Ann. 1863, p. 135, fig. 6.

Antennæ brown, annulated with yellow. Palpi pale brown. Head and thorax fuscous, with a few golden-yellow hairs. An-

terior wings pale golden-brown, with scattered ashy-grey spots and an ashy-grey transverse band before the apex; a silvery-white spot at the thyridium, and another below it; towards the base are some short blackish streaks, the outer ends of which mark the inner edge of the very ill-defined dorsal blotch; apical margin spotted with grey at the terminations of the apical veins; pterostigma yellowish-brown; veins fuscous; the female is smaller, with much narrower wings, pale fuscous, with ashy-grey irrorations, one or two silvery spots below the thyridium, and short blackish streaks near the base. Posterior wings greyish, with a faint yellowish tinge, subhyaline; pterostigma, and the apical veins, brownish. Legs pale testaceous; anterior and intermediate tibiae with a broad fuscous ring at the apex, the tarsi pale brownish. Abdomen fuscous above, ochreous beneath; appendices testaceous. In the male the lobe from the upper margin of the last segment is very short and truncated, with a straight channel-like depression in the centre, apical margin excised; app. sup. very small, only the broad apices visible; app. inf. with long basal joint, with the apex truncated and the edges turned inwards, apical joint shorter, the apex deeply divided, forming two teeth, of which the lower is the larger and more obtuse, the upper smaller and acute; sheaths very long and curved upwards. In the female the truncated margins of the valves are regularly excised.

Expanse of fore-wings 9—12 lines.

This pretty species occurs commonly in autumn in South Devon along all the streams having their origin on Dartmoor, such as the Meavey, Yealm, Erme, Teign, &c. I have also found it along the River Ceiriog at Chirk, North Wales, and near Bala. Of the female I have seen but two examples.

The other described European species belonging to this section differ considerably from *R. munda*. *R. aurata*, Brauer, possesses a long superior lobe, and widely diverging prongs to the terminal joint of the app. inf. *R. venusta*, Pict. MS. (from Curtis' collection of Pictet's types) is very similar to *aurata* in general appearance, but the prongs of the app. inf., although distant, are nearly parallel;* this species is in the Brit. Mus., taken by Dr. Leach

* The pupa figured by Pictet in his "Recherches," pl. 15, fig. 1^c, evidently belongs to *R. venusta*, and not to *R. vulgaris*, to which he refers it. The same remark applies to the figure of the appendices, pl. 4, fig. 29. In the explanation of the figures on plate 4, fig. 29 is said (perhaps accidentally) to represent the last segment of the female pupa, and fig. 30 that of the male, whereas the converse is truly the case.

in Italy. *R. stigmatica*, Kolenati, I am unacquainted with; the green pterostigma should make it easily recognizable.

There is another group of species, none of which have yet been found in Britain, of which *R. umbrosa*, Pict., may be taken as the type. These should form a new genus; they differ in being smaller and of a different *facies*, and especially in the structure of the larvæ, which (according to Pictet) do not possess external respiratory filaments. Dr. Hagen proposes to apply Kolenati's name *Crunophila* to this group, the latter author having discarded *Rhyacophila*, in consequence of its having been previously used for a genus of birds.

Dr. Hagen has also remarked (Stett. Zeit. 1859), on the existence of two unnamed species, which, in the structure of the perfect insects, seem intermediate between *Rhyacophila* and *Crunophila*; one of these I possess from the Carinthian Alps.

Genus GLOSSOSOMA, Curtis.

Antennæ shorter than the wings; basal joint thick, shorter than the head. Head transverse. Ocelli present. Maxillary palpi with two short and thick basal joints, the others longer, thin and cylindrical. Mesothorax ovate. Anterior wings narrow at the base, dilated before the elliptical apex; hairy clothing very slight, costal margin nearly straight; at the extreme base of the dorsal margin there is a small obtuse lobe; in the male there is at the base of these wings a somewhat kidney-shaped, hairy, callous appendage, which can be elevated at pleasure; neuration rather strong and distinct; the radius very slightly bent; discoidal cell large, short, broad and angular, connected with the radius by an oblique transverse vein; another transverse vein connects the lower margin of the discoidal cell with the upper branch of the superior branch of the ramus thyriifer, and another connects the two branches of this vein, placed at the point where the superior branch furcates. Posterior wings shorter, and more obtuse at the apex, than the anterior; discoidal cell closed; two transverse veins below it; the anal portion of the extreme base produced into a short rounded lobe, furnished with a longitudinal veinlet, and fringed with a tuft of hairs. Legs short; the intermediate tibiæ and tarsi strongly dilated in the female; anterior tibiæ with two short apical spurs; intermediate and posterior tibiæ each with two pairs of long and nearly equal spurs. Abdomen thin; on the antepenultimate segment there is a horny lobe on the ventral surface, and a smaller one on the penultimate; app. sup. long,

apparently two-jointed; app. inf. absent; from the middle of the ventral margin of the last segment proceeds a long horny lobe. The apex of the abdomen in the female is obtuse, forming a cylindrical tube, from which proceeds a small ovipositor.

Larva inhabiting running waters; without external respiratory filaments. Case formed of stones, arranged in an irregular heap. Cocoon thinner than in *Rhyacophila*.

1. *Glossosoma Boltoni*, Curtis.

Glossosoma Boltoni, Curt. (*) Phil. Mag. p. 216, 1 (1834);
Steph. Ill. p. 161, 1; Hag. (*) Ent. Ann. 1860, p. 82, 81;
Kol. Gen. et Spec. Trichop. pt. 2, p. 200, 2; *Rhyacophila*
vernalis, Pict. (*) Recherch. p. 189, 13, pl. 15, fig. 4 (1834);
Burm. Handb. p. 909, 3.

Antennæ brownish-testaceous, annulated with brown. Head, palpi and mesothorax brown, the head clothed with sparse greyish pubescence. Anterior wings brownish-grey, the apical portion clothed with pale golden pubescence, forming rather indistinct spots round the apical margin at the arculus and on the disc, which are most conspicuous in the male and during life; neuration brown; fringes grey. Posterior wings greyish, subhyaline, with grey fringes. Legs brownish-testaceous, the spurs dark brown. Abdomen dull dark-brown above, somewhat ochreous beneath. In the male, the ventral surface of the antepenultimate segment has a broad obtuse spoon-shaped lobe; the penultimate segment has a small projecting triangular tooth; a broad rounded cover-like lobe proceeds from the upper margin of the last segment, forming as it were a continuation of it; beneath this are two nearly straight pieces, which I consider the app. intermed.; app. sup. lying on each side of the lobe, apparently bisarticulate, the basal portion short and broad, the apical portion obtuse and curved, beset with rather long brown hairs; app. inf. apparently wanting; penis (or penis-cover?) broad, the apical portion fringed with black hairs; ventral lobe very long, dilated and concave in the middle, the apical portion produced into a long fine point; all the appendages yellow. In the female there is a small tooth on the ventral surface of the antepenultimate segment; and the apex of the abdomen is provided with a slender exerted ovipositor.

Expanse of fore-wings 9—10 lines.

Larva with the head and pronotum black, the latter hexagonal in form. Mesonotum and metanotum clear red, bordered laterally with black. (Pictet.)

Not a common species, appearing in May; found near Exeter and in other localities.

2. *Glossosoma fimbriatum*, Stephens.

(Pl. VIII. fig. 7, neuration; Pl. XIV. figs. 11, 12, app.)

Glossosoma fimbriata, Steph. (*) Ill. p. 161, 2, pl. 32, fig. 1 (1836); Brauer, Neurop. Aust. p. 37; Kol. Gen. et Spec. Trichop. pt. 2, p. 199, 1, pl. 1, fig. 7; Hag. (*) Ent. Ann. 1860, p. 82, 82; *Tinodes obscurus*, Steph. (*) Ill. p. 164, 8 (1836); *Rhyacophila decolorata*, Pict. Recherch. p. 191, 16, pl. 16, fig. 13 (1834)?

Almost entirely similar to the last, but smaller; the antennæ paler and more distinctly annulated; the wings with few traces of the golden spots; anal appendages and ventral lobes apparently precisely similar.

Expanse of fore-wings 6—8 lines.

Common in autumn about streams, especially in hilly districts.

I have a strong opinion that this is only a variety of *G. Boltoni*, perhaps an autumnal brood of that species. It is apparently much more common than *Boltoni*, but I have had no opportunity of collecting in suitable localities at the time when the latter should occur.

According to a type sent by Prof. Pictet to Dr. Hagen, *Rhyacophila decolorata* of the former author is a small species of *Glossosoma*, and perhaps identical with this.

The words "head ochreous," in Stephens' description, are not borne out by his types; this part being dark brown, concolorous with the mesothorax.

Genus AGAPETUS, Curtis.

Antennæ rather stout, shorter than the wings; the basal joint short, thicker than the others. Head with a thick tuft of hairs on the vertex. Ocelli present. Maxillary palpi with two short and thick basal joints; third joint longest, rather thinner than the two basal ones; terminal joint thinner than any of the others. Labial palpi very small. Mesothorax stout. Anterior wings densely clothed with hair, with long fringes; narrow at the base, dilated before the rounded apex; neuration moderately strong; radius nearly straight; discoidal cell closed, short and rather broad; a transverse vein connects the lower edge of the discoidal cell with the upper branch of the superior branch of the ramus thyriifer, and another connects the two branches of this vein; there are also two transverse veins near the base of the wing; three forks below the apex. Posterior wings small with very long fringes;

no discoidal cell; three apical forks; two transverse veins about the middle placed nearly in a line, and another below these more towards the base. Legs long; the intermediate tibiæ and tarsi dilated in the female; anterior tibiæ with two short apical spurs; intermediate and posterior tibiæ each with two pairs of equal spurs. Abdomen short and rather robust. In the male there is a horny lobe on the ventral surface of the antepenultimate segment, and sometimes a tuft of hairs on the penultimate; app. sup. very small or absent; app. inf. large and spoon-shaped; the penis is furnished with a cover formed of two lateral pieces connected by an extensile membrane; sheaths long and needle-shaped. The female has a long extensile ovipositor from which filamentous processes can be projected at will.

Larva inhabiting running waters; apparently gregarious; abdomen without respiratory filaments, but furnished with hairs.

Case formed of stones placed irregularly. I have found these cases in innumerable quantities covering the lower surface of large stones.

The species are small insects of dull colours, with great external similarity of appearance. The anal appendices furnish easily recognizable characters, and the neuration should also be carefully examined. We possess two species.

1. *Agapetus fuscipes*, Curtis.

(Pl. VIII. fig. 8, neuration; Pl. XIV. fig. 13, app.)

Agapetus fuscipes, Curt. (*) Phil. Mag. p. 217, 1 (1834); Steph. (*) Ill. p. 156, 2; *A. ochripes*, Curt. Phil. Mag. p. 217, 2 (1834); *Rhyacophila tomentosa*, Pict. Recherch. p. 189, 11, pl. 16, fig. 9 (1834); *Agapetus funereus*, Steph. (*) Ill. p. 156, 1 (1836); Hag. (*) Ent. Ann. 1860, p. 81, 79; *A. comatus*, Steph. (*) Ill. p. 157, 4 (1836).

Antennæ and palpi blackish-fuscous. Head and thorax black, with yellowish hairs. Anterior wings greyish-fuscous, with yellowish hairy clothing; fringes greyish-fuscous. Posterior wings greyish-fuscous, somewhat iridescent, with concolorous fringes. Legs fuscous. Abdomen black. In the male there is a long curved testaceous horny lobe, placed on the ventral surface of the antepenultimate segment, reaching beyond the base of the anal appendices, rather dilated at the extremity; app. sup. wanting; app. inf. long, dilated at the base, the tips produced, dentate internally; penis-covers straight, with an extensile membrane between them; sheaths long and needle-shaped, the tips

projecting rather beyond the app. inf. and curved upwards and outwards, hook-like. In the female there is an exerted ovipositor furnished with extensile filaments.

Expanse of fore-wings $3\frac{1}{2}$ —5 lines.

Common about streams in many parts of the country. The long lobe on the ventral surface of the abdomen of the male renders this species easily recognizable.

The type of *A. setiferus*, Steph. Ill. p. 157, 5, is wanting.

2. *Agapetus comatus*, Pictet. (Pl. XIV. figs. 14, 15, app.)

Rhyacophila comata, Pict. Recherch. p. 194, 21, pl. 16, fig. 17 (1834); *Agapetus laniger*, Steph. (*) Ill. p. 156, 3 (1836); *A. ciliatus*, Hag. (*) Ent. Ann. 1860, p. 81, 80.

Antennæ and palpi fuscous. Head and thorax pale fuscous, with yellowish hairs. Anterior wings greyish with an ochreous tinge, somewhat iridescent; fringes concolorous. Posterior wings pale grey, with concolorous fringes. Legs ochreous, somewhat fuscous. Abdomen pale fuscous. The lobe on the ventral surface of the antepenultimate segment in the male short, straight and obtuse, not reaching nearly to the apex of the abdomen; on the penultimate segment is a tuft of long hairs; app. sup. very small; app. inf. long, dilated at the tips, not toothed within; penis-covers straight, with an extensile membrane between them; sheaths needle-shaped, quite straight, about the same length as the app. inf. In the female there is a notched tube whence proceeds the ovipositor, which is furnished with extensile filamentous processes.

Expanse of fore-wings 4— $4\frac{1}{2}$ lines.

Occurs about rivers in many parts of the country; very abundant along the Dee near Llangollen, in autumn. It is a paler and more delicate species than the last, and may be readily separated by the form of the ventral lobe in the male.

Genus *BEREA*, Stephens.

Antennæ slightly shorter than the wings, stout; the basal joint very long and thick, very hairy, with a tooth (or tuft of long hairs?) internally in the male; thinner in the female. Head nearly without hairs. Ocelli absent. Maxillary palpi very hairy; first joint short, the rest longer and nearly equal. Labial palpi with short basal joint, the two others longer and cylindrical. Mesothorax flattened above, smooth and polished. Anterior wings narrow at the base, much dilated before the apex, which is

obtusely rounded; hairy clothing very dense and long, with long fringes; in the male there is a callous cornucopia-shaped knob-like appendage at the base (analogous to that in *Glossosoma*); neuration very fine and indistinct, even under the microscope; discoidal cell open; in the male the two branches of the ramus discoidalis are simple, in the female the lower branch is forked; in the male the superior branch of the ramus thyriifer is simple, the inferior branch forked, and each branch again furcates; in the female the superior branch is forked and the lower prong again divides, the inferior branch is twice forked at the apex. Posterior wings shorter than the anterior, but nearly as broad; apex broadly rounded; fringes very long; neuration alike in the sexes, but in the male there is a shallow curved fold or pouch in the middle of the wing directed towards the apex and beset with thicker hairs; forks two. The transverse veins are apparently absent in all the wings. Legs rather short; intermediate tibiæ not dilated in the female; anterior and intermediate tibiæ each with a pair of apical spurs; posterior tibiæ with two pairs of spurs.* Abdomen short, thin in the male, stout and somewhat depressed in the female. In the male the ventral surface of the antepenultimate abdominal segment has a small horny lobe, and the penultimate segment a pencil of hairs; the appendices vary considerably according to the species, they are usually thin and style-like, often curved. In the female the terminal abdominal segment is very broad and turned upwards, the upper and lower margins widely separated and forming an oval cavity in which the eggs are carried; the antepenultimate segment with a small ventral tubercle analogous to that in the male.

Larva unknown; inhabiting standing or slowly-running waters.

The small black insects comprised in this genus are very difficult to separate satisfactorily. The shape of the anterior wings and the form of the anal appendices in the males seem to furnish the best characters; but they stand in need of further investigation.

The synonymy of the species of *Beræa* is in a very confused state, and is likely to remain so. The different species resemble each other so greatly that it is impossible to apply the descriptions of various authors, as these have all neglected any investigation of the structural characters. I regret exceedingly that I am unable to speak with certainty of those described by Curtis (forming his genus *Thya*), as I was unacquainted with good characters whereby

* In Kol. Gen. et Spec. Trichop. pt. 2, p. 227; Brauer, Neurop. Aust. p. 38; Hag. Neurop. N. Amer. p. 296, and "Synopsis Synonymica" (Systema), *Beræa* is erroneously said to have 2.4-4 spurs.

to separate them, at the time when his Collection was sent to the Colony of Victoria. The character given in the description of *T. pullata*, "superior wings with a few obscure whitish spots," is imaginary; perhaps these wings were marked by the fingers in the capture of the insect. Of the species of *Rhyacophila* described by Pictet, *R. penicillus*, *melas*, *barbata*, *nigrocincta* and *articularis*, probably all belong to *Beræa*; the few types existing are females and indeterminable. Of the species described by Stephens, the types of *B. albipes* are absent from his Collection, and those of the other two species are unfortunately females. Kolenati admits three species, but appears to have been personally acquainted with one only; this I cannot identify with any of ours. We probably possess more species than are here given; I am acquainted with at least one other Continental species.*

I am doubtful as to the propriety of superseding Curtis' generic name *Thya*, which has the right of priority. That name was certainly employed previously by Dr. Leach to designate a genus of Crustacea, but the two genera are never likely to be confounded. The strict application of the rule that forbids the identity of generic names in the Animal Kingdom (and some writers would even apply this to the whole range of natural productions), is productive of great inconvenience, and is driving modern authors to the creation of names, purely imaginary, and which admit of no explanation.

1. *Beræa pullata*, Curtis.

(Pl. VIII. fig. 9, neuration; Pl. XIV. figs. 16, 17, app.)

Thya pullata, Curt. Phil. Mag. p. 215, 7 (1834)?; *Beræa albipes*, Steph. Ill. p. 158, 1 (1836)?; *B. Murshamella*, Steph. Ill. p. 158, 3 (1836)?.

Antennæ, head, palpi, thorax, wings and abdomen black.

* Mr. Eaton has taken, at Cambridge, in 1865, a minute black insect with the *facies* of *Beræa*, which appears to be identical with *Silo minutus*, Kol. (Gen. et Spec. Trichop. pt. 1, p. 101, 1), and probably with *Phryganea minuta*, Linn. (Faun. Suec. n. 1501). Dr. Hagen has compared Mr. Eaton's insect with types of *S. minutus* sent to him by Kolenati, and also with specimens sent by him to Kolenati, and named by the latter. But it is to be remarked that, according to the generic description, Kolenati's *Silo* should have 2-4-4 spurs, whereas our insect has only 2-2-4, and the figure of the neuration does not agree; however, in the face of this double determination, there can be no doubt that this generic description is erroneous. The insect is probably allied to *Beræa*, but differs considerably in the neuration. I have not sufficient materials in hand for a description. As before mentioned (p. 82), Kolenati misapplied Curtis' generic term *Silo*; and a new name will have to be adopted for this species.

Wings very broadly rounded at the apex. Legs with black thighs, and brownish-black tibiæ and tarsi. In the male the app. sup. are broad and obtuse, black; app. intermed. long, fine, needle-shaped, curved and testaceous; app. inf. long and slender, very strongly curved inwards, the tips testaceous; the ventral margin of the last abdominal segment is produced in the middle into a narrow truncated lobe; the horny lobe on the ventral surface of the antepenultimate segment is subtriangular, black, testaceous at the apex. In the female the dorsal and ventral margins of the last segment form an egg-pouch, whence are protruded two broad and obtuse appendices.

Expanse of fore-wings $4\frac{1}{2}$ — $5\frac{1}{2}$ lines.

Occurs not uncommonly about standing and slowly-running waters in summer.

The size (6 lines) given by Curtis makes me think that this is the species intended by him, but I have never seen an example so large, and when I compared my specimens with his, I did not notice that the latter exceeded mine in this particular. I am strongly of opinion that *Marshamella* of Stephens is identical, but the single type is a female, which has not appreciably narrower wings, as the description would lead us to expect.

It appears evident to me that Dr. Hagen had this species before him, when drawing up the characters of the genus in the *Stettin Zeitung*, 1859, pp. 163, 164. The description of the appendices there given agrees precisely with *B. pullata*, but does not apply to other species, especially as regards the prolonged lobe from the middle of the ventral margin of the last abdominal segment, which I do not see in any other.

2. *Berœa Maurus*, Curtis. (Pl. XIV. fig. 18, app.)

Thya Maurus, Curt. Phil. Mag. p. 215, 4 (1834)?; *Berœa pygmœa*, Steph. Ill. p. 158, 2 (1836)?.

Antennæ, head, palpi and abdomen black. Wings narrower than in the last species, the apex more pointed; black, with a faint brownish tinge, which is especially evident on the fringes of the posterior pair. Legs dark brownish-black, the tarsi somewhat paler. In the male the appendices differ greatly from *B. pullata*; app. sup. long, slender, needle-shaped, curved strongly inwards, testaceous; app. intermed. apparently absent, but in their place is a long obtuse lobe proceeding from the upper margin of the last segment; app. inf. placed on a triangular base, short, ending in two short widely divaricating branches, black;

ventral margin of last segment not produced in the middle; ventral horny lobe slender and testaceous.

Expanse of fore-wings $4\frac{1}{2}$ lines.

I possess two examples, one of which is from Taunton. It is probably equally common with the preceding, but overlooked.

The characters given by Curtis, "wings narrower and more lanceolate," render it probable that this is rightly determined. The two female types of *pygmæa*, in Stephens' Collection, also appear to have decidedly narrower wings.

GENUS CHIMARRA, Leach.

Antennæ thin, not so long as the wings, the basal joint not longer or stronger than the others; placed very widely apart. Head rounded, densely clothed with hair. Ocelli present. Maxillary palpi long; basal joint short, second joint very long with a tuft of hairs at the apex, third shorter than the second, fourth still shorter, fifth rather longer than the fourth and somewhat flexible. Labial palpi long, basal joint thin, second joint longer and much dilated, third joint flexible. Mesothorax robust. Anterior wings narrow, the costal and dorsal margins nearly parallel, apex rounded; hairy clothing short and rather dense; discoidal cell apparently open; just before the ramus discoidalis furcates it is interrupted by a small naked cell-like space, and both branches of it end in long furcations; upper branch of the anterior branch of the ramus thyriifer forked, the lower simple. Posterior wings shorter and rather broader than the anterior, rounded at the apex; a small closed discoidal cell; otherwise the arrangement of the apical veins is very similar to that of the anterior wings. Legs moderately long, the intermediate tarsi somewhat dilated in the female; anterior tibiæ in the male spurless, in the female with one short apical spur; intermediate and posterior tibiæ each with two pairs of rather long spurs. Abdomen robust, especially in the female. Anal appendices small.

Larva unknown; inhabiting swift torrents.

1. *Chimarra marginata*, Linné.

(Pl. VIII. fig. 10, neuration and maxillary palpus.)

Phryganea marginata, Linn. Syst. Nat. ed. 12, p. 910, 14 (1766); Fab. Syst. Ent. 307, 11; and other authors; *Chimarra marginata*, Curt. (*) Brit. Ent. pl. 561; Steph. (*) Ill. p. 191, 1, pl. 33, fig. 4; Burm. Handb. p. 910, 1; Ramb. Hist. Nat.

Névrop. p. 498; Kol. Gen. et Spec. Trichop. pt. 2, p. 205, 1, pl. 1, fig. 5; Hag. (*) Ent. Ann. 1860, p. 84, 86.

Antennæ dark fuscous, nearly black, not annulated, basal joint clothed with yellow hairs. Head and prothorax thickly clothed with yellow hairs. Mesothorax deep blackish-fuscous. Anterior wings dark smoky-fuscous; costal margin broadly yellow nearly to the apex, an oblique yellow stripe reaches from the middle of the base to the anal angle, and the dorsal margin is narrowly yellow; apical cilia yellow. Posterior wings smoky-fuscous, with a broad yellow pterostigma. Legs brownish-ochreous. Abdomen dark blackish-fuscous. In the male there appear to be two small hooked app. sup., the apices turned outwards, and between these two small divergent app. intermed.; app. inf. apparently wanting.

Expanse of fore-wings 6—8 lines.

This peculiar insect, which, from its structure and coloration, cannot be confounded with any other species, is common about waterfalls and torrents in many parts of these islands. It delights to sit on the green mossy boulders usually to be found in mountain streams. It occurs in summer in various localities in Devonshire, Wales, the North of England, &c., and also in Scotland, and at Killarney in Ireland.

Note.—The two species of *Lepidoptera*, erroneously described as *Trichoptera*, and referred to at p. 3, are as follow:—

1. *Acentropus niveus* (*Phryganea nivea*), Oliv., Steph. Ill. p. 150, 1=*Zancle Hansoni*, Steph.=*Acentropus Garnonsii*, Curt. Brit. Ent. pl. 497.

2. *Narycia elegans*, Steph. Ill. p. 154, 1, pl. xxxiii. fig. 4, identical with *Lampronia melanella*, Steph. Ill. Haustell. iv. 358, 8=*Xysmatodoma melanella*, Zell., Sta.

Kolenati inserts *N. elegans* in part 2 of his Gen. et Spec. Trichop. p. 294, but does not appear to have been personally acquainted with the insect; his figure, pl. v. fig. 62, is an exact copy of that of Stephens.