

**A note on the Two-winged Flies (Diptera)
associated with ghyll woodlands in Sussex**

Patrick Roper (Recorder for Sussex Diptera)

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In the early 1960s I lived on a farm in Robertsbridge, East Sussex and spent much time studying its insect fauna, especially the Diptera. One of the more interesting habitats was a small, spring-fed, woodland stream and, as well as catching insects along its length, I ran an emergence trap from time to time close to its source.

Since the 1960s I have investigated several similar ghyll streams in the same broad area and have prepared this brief account of my experiences as a contribution to the study of ghyll woodlands currently being undertaken in Sussex with Interreg funding from the European Community..

Small woodland streams with a permanent flow of water present a variety of niches where flies and other invertebrates breed. Many of these species are not associated with other aquatic habitats and they often emerge in some numbers in the colder months of the year providing food for birds, spiders and other creatures that feed on flying insects. In some places flies like *Micropsectra fusca* and *Thaumalea testacea* occur. These are more commonly found in the colder moorland streams of northern and western Britain, the inference being that they are relicts in the South East in spring-fed streams in shaded situations. In this context it is worth quoting from Cranston & Stubbs (1978): "The temperature of springs is almost constant at 8°C winter or summer, and in many invertebrate groups the fauna can be described as glacial relict. When the last ice age retreated cold adapted forms either retreated behind the ice sheets or were isolated in regions of thermostable cold water, the springs. For this reason it is suggested that the isolated occurrence of some northern crane-fly species in S. E. England, up to a hundred miles from the nearest locality, may be due to survival in cold springs, insulated from possibly lethal higher air temperatures. There is scope for more study of lowland spring faunas by dipterists. The presence of natural woodland around a spring is a good sign that the fauna of the spring may be natural."

Where water is fast-flowing larvae of several species of black flies occur (*Simulium* spp.), some of them rarely recorded, and there are a number of non-biting midges (Chironomidae) and moth flies (Psychodidae) as well as the better known, non-dipterous, stone flies (Plecoptera), caddis flies (Trichoptera) and mayflies (Ephemeroptera).

At the stream edges the U-shaped larvae of several species of meniscus midges (Dixidae) are often abundant and wet, fallen timber is the larval habitat for some crane-flies (Tipulidae, Limnobiidae and related families). Muddy margins and flushes beside woodland streams provide breeding sites for a range of species that are not normally found in non-woodland muddy substrates and these include some of our largest and most distinctive British crane-flies.

On wet rocks, banks and stream sides some of the most interesting ghyll diptera have larvae that live on the mosses and liverworts that grow in these places. Examples are the white-footed ghost crane-fly, *Dolichocheza albipes*, and the RDB3 snipe fly *Spania nigra*. The giant lacewing, *Osmylus fulvicephalus* (Neuroptera: Osmylidae), has larvae which also live in moss at the edge of woodland streams and is occasionally recorded from Sussex ghylls.

Overhanging tree roots along ghylls are important in providing damp, shady roosting places for crane-flies, midges, fungus gnats and other diptera. These do not necessarily breed in the water or streamside bryophytes, but are frequently active in the evening or after dark and in the daytime are vulnerable to desiccation and predation so need sheltered places with high humidity.

The following is a selection of diptera either known to be, or likely to be, associated with Sussex ghylls:

Tipulidae – Larger crane-flies

Dolichocheza albipes White-footed ghost

A very dark crane-fly with white tarsi (often the only parts of the insect that can be easily seen). Found beside heavily shaded streams in woods and on moorlands. The larvae live in patches of liverwort along densely shaded stream banks.

Tipula fulvipennis

A large species that is widespread in Britain favouring wet woodlands and shady stream sides where the larvae are found in wet soil.

Tipula maxima

The largest British crane-fly and one of the largest of British flies. Found mainly in wet woodland beside streams and seepages. Pierre (1924) says this species is parasitised by the Tachinid fly *Siphona cristata*, (normally associated with Noctuid lepidoptera) a species that has been reported from Sussex by P. J. Hodge.

Tipula vittata Meigen

An early-flying species of wet woodlands where the larvae live in boggy flushes and stream sides.

Limnobiidae – Smaller crane-flies

Elaeophila submarmorata

A species with aquatic larvae with adults found beside streams and seepages in shady places. Several other British *Elaeophila* are found in similar situations.

Psychodidae – Moth Flies

Many moth flies are associated in their early stages with small woodland streams. Rather few of these have been recorded from Sussex though they are probably present. The notes below are from Withers (1989).

***Sycorax* spp.**

The extraordinarily ornate larvae of *Sycorax* are found in moss near springs and trickles.

Bazarella neglecta

Larvae have been found in clumps of moss around mill races and waterfalls and reared from the moss *Eurynchium ripariodes*

***Tonoiriella* spp.**

Larvae occur in springs and unpolluted flowing streams.

***Pericoma* spp.**

Many species are found in rotting vegetation or moss beside streams. I have taken *Pericoma nubila*, *P. pulchra* and *P. fuliginosa* in an emergence trap on a Sussex woodland spring stream.

Threticus lucifugus

Larvae from rotting leaves at stream margins.

***Mormia* spp.**

Larvae are prevalent in woodland where soil is continually moistened by trickling water.

Ptychopteridae. Ptychopterid crane flies

All the seven British species of these attractive crane flies with orange and black bodies and dark spotted wings have been recorded from Sussex. The rat-tailed larvae live in mud and silt in shallow water. The three below are found mainly beside woodland streams.:

Ptychoptera lacustris

A widespread species

Ptychoptera longicauda

A rare species sometimes found with *P. lacustris* and with similar habitat requirements.

Ptychoptera paludosa

Prefers more densely shaded streams than the previous two species.

Dixidae – Meniscus midges

The small, but attractively patterned, members of the genus *Dixa* tend to be associated with woodland streams in their early stages and several of these have been found in Sussex. Larvae live at the edge of the water (hence the name 'meniscus'). The following species have been recorded from East Sussex woodland streams:

Dixa nebulosa

Dixa nubilipennis

Dixa submaculata

Thaumaleidae – Trickle midges

This small family with only three British species is associated with trickles and streams mainly in the north and west. Like the Dixidae, the larvae live at the interface between land and water and appear to be extremely sensitive to pollution (Disney, 1999).

Thaumalea testacea

This was taken in Ashdown Forest over 70 years ago and by myself in an emergence trap on a woodland spring stream at Robertsbridge in February 1962. It appears to be very uncommon but, where found, is probably a good indicator of unpolluted water and, in woodland ghylls, long continuity of habitat.

Simuliidae – Black flies

Various black flies breed in Sussex woodland streams and some are rarely recorded and of considerable interest to geneticists and others. A request has been forwarded to R. W. Crosskey at the Natural History Museum for further information. Roger Crosskey is a world expert on the group and has done fieldwork in Sussex in the past.

Chironomidae – Non-biting midges

Many species breed exclusively, or by preference, in small woodland streams often in considerable quantities. The larvae provide food for larger carnivorous invertebrates and the adults for birds and spiders. Apart from the *Corynoneura*, the species below were all caught in an emergence trap over a woodland spring stream at Robertsbridge. Many more species than this are associated with ghyll woodland streams countywide.

Prodiamesa olivacea

Brillia modesta

Parametriocnemus stylatus

Rheocricotopus dispar

Limnophyes prolongatus

Chaetocladius perennis

Chaetocladius piger

This can emerge in considerable quantities from December to March.

Thienemanniella majuscula

***Corynoneura* spp.**

I have taken many examples of these very tiny insects along woodland streams in Sussex, mostly in winter. They are a difficult group and some are probably species yet to be described.

Micropsectra fusca

Normally associated with mountain and moorland streams in the north but sometimes found near cold woodland springs in Sussex.

Micropsectra junci

Micropsectra notescens

Rhagionidae – Snipe flies

Spania nigra

A small, dark species whose larvae are said to mine the leaves of liverwort (*Pellia* etc.). Has been recorded from East Sussex.

Tabanidae – Horse flies

***Chrysops* spp.**

Larvae often found in mud or sand at the edges of streams or brooks.

Empididae

Hemerodromiinae

Many species of this subfamily are associated with streams and running water and have predatory larvae that are hygropetricous and live in mosses and on wet rocks.

Clinocerinae

***Wiedmannia* spp.**

Larvae recorded from streams

Clinocera stagnalis

Often common along woodland streams, even when they are drying up in summer.

Dolichopodidae

***Dolichopus* spp.**

The larvae of several species have been recorded from the edges of woodland streams.

Lonchopteridae

Lonchoptera tristis

This is often found along heavily shaded woodland streams, even when drying up in summer.

Syrphidae – Hoverflies

***Orthonevra* spp.**

Larvae found in mud at the edges of woodland streams and ponds.

Sphaeroceridae – Lesser dung flies

Many sphaerocerids can breed in a wide range of decaying organic material including mud. The adults of a range of species occur in large numbers with Ephydriidae on mud at the borders of woodland streams.

Ephydriidae – Shore flies

Several species occur beside woodland streams and the larvae develop in a wide range of semi-aquatic habitats.

Scathophagidae – Dung flies

Acanthocnema glaucescens

Females of this species crawl beneath the water of streams, down the sides of projecting stones. They then lay their eggs in the egg masses of *Dixa*, other flies and Trichoptera. The larvae feed on the eggs and surrounding jelly of the host (Smith, 1989).

Coniosternum obscurum

Larvae feed on the egg masses of caddis flies (Smith, 1989)

Muscidae

***Limnophora* spp.**

The larvae of many species develop in mosses and liverworts in running water. They prey mainly on oligochaetes and small insect larvae.

REFERENCES

- Cranston, P. & Stubbs, A. E.** (1978) Flowing Waters. *In* **Stubbs, A. E. & Chandler, P.** (1978) *A Dipterist's Handbook*. Amateur Entomologists' Society, Hanworth, Middlesex.
- Disney, R. H. L.** (1999) *British Dixidae and Thaumaleidae*. Freshwater Biological Association. Scientific Publication No. 56. Ambleside, Cumbria
- Pierre, C.** (1924) Diptères: Tipulidae. *Faune de France* 8. Lechevalier, Paris.
- Smith, K. G. V.** (1989) An Introduction to the Immature Stages of British Flies. *Handbooks for the Identification of British Insects* **10** (14). Royal Entomological Society, London
- Withers, P.** (1989) Moth Flies. Diptera: Psychodidae. *Dipterists Digest*. (1st Series) **4**: 1-83