



# A remarkable aggregation of flies above a road surface, including ten species new to the Dutch fauna (Diptera)

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*Abstract:* A remarkable aggregation of flies was found above the surface of a gravel road. This aggregation consisted mainly of species of the families Empididae, Hybotidae and Clusiidae. *Hilara albipennis*, *H. hirtipes*, *Rhamphomyia obscuripennis*, *R. pilifer*, *R. argentata* (Empididae), *Oedalea stigmatella* (Hybotidae), *Clusiodes verticalis*, *C. gentilis*, *C. ruficollis* (Clusiidae) and *Stegana similis* (Drosophilidae) are reported as new to the Dutch fauna. Additional data on some species are given.

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## Introduction

From the 31st of May till the 2nd of June 1991 the Dutch Entomological Society held its annual Summer Meeting in the south of the province of Limburg. The weather during this meeting was good: 20-25 °C, rather high air humidity and sunny for most of the time.

At the end of the last day the author visited the hill the Riesenberg near Gronsveld. The collecting site was a 2 meter wide gravel road along the foot of the hill. This road runs from northeast to southwest. On the northwest side is the actual hill, on the southeast side is a valley with some meadows and cereal crops. Between the road and the valley is a strip of woodland of varying width. The road sides have a mixed vegetation of flowering herbs and grasses interspersed with some brambles and bushes. On the hill is a deciduous forest. Different parts of the road are exposed to the sun at different times of the day but at the time of collecting (15.30-16.30 h.) most of the road was in the shade.

Just above the road surface was a remarkable activity of insects. Using a sweep net a large collection was made over a stretch of road of about 600 m. The bulk of the insects proved to be Diptera and the few others were Hymenoptera. From the Diptera in the net a selection was made using an exhaustor. After identification it turned out that a number of

species had not been reported from The Netherlands before, although all species appeared to be present in Dutch collections. The newly recorded species belong to the Empididae (*Hilara albipennis* Von Roser, *H. hirtipes* Collin, *Rhamphomyia argentata* Von Röder, *R. obscuripennis* Meigen and *R. pilifer* Meigen), Hybotidae (*Oedalea stigmatella* Zetterstedt), Clusiidae (*Clusiodes gentilis* (Collin), *C. ruficollis* (Meigen) and *C. verticalis* (Collin)) and Drosophilidae (*Stegana similis* Laštovka & Máca). Most specimens are deposited in the author's collection. The material is labelled: "GRONSVELD (Limb) NL/Riesenberg/Am.-coor.: 180-314/2.vi.1991/P. L. Th. Beuk". Additional material was studied from the collections of B. van Aartsen, 't Harde, W. van Steenis, Wageningen and from the collections of the Zoological Museum, Amsterdam (ZMA), the National Museum of Natural History, Leiden (RMNH), the Noordbrabant Natuurmuseum, Tilburg and the Department of Entomology of the Agricultural University of Wageningen.

## Species account

### Empididae

De Meijere (1939) recorded 39 species of *Hi-*

*lara* Meigen from The Netherlands. Since then the genus was studied in detail by several authors (e.g. Collin, 1961) but the review of the Dutch species has started only recently (personal communication V. S. van der Goot).

The genus *Hilara* is a typical empid genus resembling *Empis* Linnaeus and *Rhamphomyia* Meigen in morphology and habits. However, *Hilara* differs from these genera in the presence of a particularly shaped fork in vein  $R_{4+5}$  and the structure of the male genitalia, in which the aedeagus is completely sheathed by the hypandrium. In many species the fore metatarsus of the male is conspicuously enlarged. *Hilara* shares with the other two mentioned genera the habit of swarming and the male presenting the female a wedding present before copulation.

#### *Hilara albipennis*

Material examined: Limburg: Gronsveld (Riesenberg: ♀: 2.vi.1991) (specimen lost); Vijlen (♂: 2.vi.1991); Gelderland: Leuvenum (2♂♂, ♀: 30.iv.1991); Tongeren (4♂♂, 6♀♀: 5.v.1991; 2♀♀: 26.v.1991). In the ZMA collection further material is available from Thesinge, Vlagtwedde (both Groningen) and Bussum (Noord-Holland) (det. V. S. van der Goot) (personal communication V. S. van der Goot).

*Hilara albipennis* is not a common species but occasionally it can be very abundant. A malaise trap at Tongeren yielded scores of specimens (personal communication V. S. van der Goot). The species is further recorded from Britain (uncommon according to Collin, 1961), Denmark, Germany, Poland, Czechoslovakia, Austria and Italy (Chvála & Kovalev, 1989).

#### *Hilara hirtipes*

Material examined: Limburg: Gronsveld (Riesenberg: 3♂♂: 2.vi.1991; Savelsbos: ♂: 2.vi.1991); Mechelen (2♂♂: 31.v.1991). Material from the following localities was identified by M. Chvála (Prague) and is deposited in the ZMA: Cadier, Colmont, Rothem, Sint Pietersberg (all Limburg) and 't Harde (Gelderland) (Van der Goot, in litt.).

This species was recorded from Great Britain only (Chvála & Kovalev, 1989). In southern England it is not an uncommon species in woodlands (Collin, 1961).

Not all Dutch specimens were collected in woodland. The specimens from Mechelen were collected from a swarm above a pile of logs under some overhanging tree branches at about 800 m distance from the closest woodland.

#### *Rhamphomyia* Meigen

The genus *Rhamphomyia* was so far represented by 23 species in The Netherlands (De Meijere, 1939; Meuffels, 1970). The species of this genus resemble those of *Empis* very much, not just in their appearance but also in their behaviour. The main differences in habitus compared to *Empis* are the absence of the fork in vein  $R_{4+5}$  and the shorter labrum (usually shorter than the head is high).

#### *Rhamphomyia (Pararhamphomyia) obscuripennis* (= *nitidicollis* Frey)

Material examined: Limburg: Cadier (♂: 13.v.1989; ♀: 2.v.1990); Elsloo (♂: 18.v.1991; ♂: 27.v.1991); Gronsveld (Savelsbos: ♂, ♀: 2.vi.1991; Riesenberg: ♀: 2.vi.1991); Mechelen (♀: 1.vi.1991); St. Pietersberg (2♂♂: 8.vi.1991); Gelderland: Ede (2♂♂: 16.v.1989); 't Harde (♀: 4.v.1990; ♂: 13.v.1990); Hoog Soeren (♀: 19.v.1989); Schaarsbergen (♂: 20.v.1986); Tongeren (♂, 3♀♀: 30.v-6.vi.1989); Vorden (♂: 4.v.1989); Vierhouten (♀: 27.v.1990); Noord-Holland: Hilversum (♀: 13.v.1989).

Nothing is known about the ecology of this species but the localities given indicate an occurrence in woodland. The specimens from Ede (leg. H. H. Evenhuis) were swept from a swarm above a sandy patch in a forest. One of the specimens from the Savelsbos was swept from *Stellaria* sp.

*Rhamphomyia obscuripennis* seems to be widespread in The Netherlands. In Europe its distribution is limited to Finland, the north of

the Russian Federation, Germany, Belgium and Czechoslovakia (Chvála & Wagner, 1989). In most works (e.g. Barták, 1982) it was included under the name *R. niidicollis*.

*Rhamphomyia (Pararhamphomyia) pilifer*  
(= *dentipes* (Zetterstedt))

Material examined: Limburg: Gronsveld (Riesenberg: 3♀♀: 2.vi.1991); Vijlen (♂: 28.v.1991; 2♀♀: 21.v.1991, 1.vi.1991).

*Rhamphomyia pilifer* was described from the area around Liège (Belgium) and it has been recorded from almost the whole of north, west and central Europa (Chvála & Wagner, 1989). Collin (1961) mentions a rearing record from a birch stump (under the name *R. dentipes*).

*Rhamphomyia (Rhamphomyia) argentata*

Material examined: Limburg: Gronsveld (Riesenberg: 2♂♂, 4♂♂: 2.vi.1991); St. Pietersberg (♂: 9.v.1951); Vijlen (♂: 13.v.1989).

*Rhamphomyia argentata* is a central European species further known from Germany, Austria and Czechoslovakia (Chvála & Wagner, 1989). Nothing is known about the ecology of this species.

Other Empididae collected at the Riesenberg: *Empis (Empis) nuntia* Meigen (16♂♂, 12♀♀); *E. (Empis) planetica* Collin (9♂♂, 4♀♀; only recorded from the south of Limburg (Van der Goot, 1989)); *E. (Xanthempis) stercorea* Linnaeus (♂); *Hilara albitarsis* Von Roser (= *argyrosoma* Strobl (De Meijere, 1939)) (3♂♂, 5♀♀); *Rhamphomyia (Rhamphomyia) sulcata* (Meigen) (♂, 2♀♀); *R. (Megacyttarus) crassirostris* (Fallén) (♂, 2♀♀); *R. (Holoclera) nigripennis* (Fabricius) (3♂♂); *R. (Aclonempis) longipes* (Meigen) (4♂♂, ♀).

### Hybotidae

Species of the genus *Oedalea* Meigen are all characterised by long antennae, a glossy black thorax and abdomen, and swollen femora with ventral spines. Larvae have been bred from dead wood (Chvála, 1983). Usually adults can

be swept in low numbers from leaves of trees and shrubs. At the Riesenberg large numbers of *Oedalea* had aggregated and four species were present in the material collected.

*Oedalea stigmatella*

Material examined: Limburg: Gronsveld (Riesenberg: ♀: 2.vi.1991); Gelderland: Winterswijk (♀: 25.vi.1991); Overijssel: De Lutte (♀: 5.vi.1990).

This is the most common species of the genus in the north of Europe (Chvála, 1983) and it further occurs in northwestern and central Europe and the adjacent part of the Soviet Union (Chvála & Kovalev, 1989).

Other Hybotidae collected at the Riesenberg: *Ocydromia glabricula* (Fallén) (2♂♂, ♀); *Oedalea flavipes* Zetterstedt (4♂♂, 5♀♀), *O. holmgreni* Zetterstedt (13♂♂, 12♀♀), *O. tibialis* Macquart (♂), *Platypalpus agilis* (Meigen) (♂); *Platypalpus minutus* (Meigen) (4♂♂, ♀); *Platypalpus pallipes* (Fallén) (♀), *Trichina elongata* Haliday (♂).

### Clusiidae

The genus *Clusiodes* Coquillett is the largest genus of the family Clusiidae. In Europe 9 species of *Clusiodes* occur (Soós, 1984; Withers, 1985). They have been reared from dead wood and larvae and pupae can be found under bark and in relatively soft wood (Stubbs, 1982). Courtship and mating can be observed on tree stumps and logs. Adults have been reported to feed on nectar, rotting vegetable matter or sap (Soós, 1987). Species of the subgenus *Clusiodes* are yellow and black but some species show intraspecific variation in the colour distribution. The tips of the wings are darkened.

So far only three species of the Clusiidae were recorded from The Netherlands: *Clusia flava* Meigen, *Clusiodes (Clusiodes) albimanus* (Meigen) and *Clusiodes (Clusiodes) caledonicus* (Collin). The material collected at the Riesenberg contained three *Clusiodes*-species, all of which were new for the Dutch fauna.

*Chusiodes (Columbiella) verticalis*

Material examined: Limburg: Gronsveld (Riesenberg: 2♂♂: 2.vi.1991); St. Pietersberg (♀: 25.viii.1988).

Thus far *C. verticalis* was recorded from Finland (Frey, 1928), Sweden (Andersson, 1971), Belgium (Fassotte & Grootaert, 1981), Great Britain and Ireland (Stubbs, 1982), Norway (Greve, 1983), Hungary (Soós, 1984) and Czechoslovakia (Máca, 1985). The pupa has been found in rotten birch (*Betula* sp.) (Withers, 1985).

*Chusiodes (Chusiodes) gentilis*

Material examined: Limburg: Gronsveld (Riesenberg: 2♂♂, ♀ cf: 2.vi.1991); Zeeland: Sluis (♂: 13.v.1988); Flevoland: Zanddepot A72/A73 (♂: 4-8.vi.1986), Noord-Holland: Texel (De Koog: 2♂♂, 5♀♀ cf: 26.viii-7.x.1989).

Like *C. caledonicus* this species has partly black fore legs and only two pairs of fronto-orbital bristles. Both species are closely related to each other and there are no reliable characters to separate the females (Stubbs, 1982). The distinguishing characters given by Czerny (1928) are of no use, except for the male genital characters. Specimens of this species at the ZMA were mainly deposited under *C. caledonicus*.

In our country *C. gentilis* is a scarce but very widespread species. In Europe it is widespread as well: Belgium (Grootaert et al., in press), Britain, Poland, Finland and the northwestern part of the Russian Federation (Soós, 1984). This species has been reared from rotten willow (*Salix* sp.) and rotten birch (Withers, 1985).

*Chusiodes (Chusiarina) ruficollis*  
(= *fascialis* (Collin))

Material examined: Limburg: Colmont (♀: 28.v.1989); Elsloo (♂: 9.v.1967); Gronsveld (Riesenberg: ♂, ♀: 2.vi.1991); Heerlen (♀); St. Pietersberg (♂, 2♀♀: 27.v-9.ix.1987; ♂, 4♀♀: 1.v-30.vii.1988; 4♀♀: 20.v-7.vii.1989); Gelderland: Berg en Dal (♀: 20-27.v.1987); Nunspeet (4♀♀: 20.vi-20.viii.1977); Flevoland: Lelystad

(6♀♀: 14.v-17.viii.1986); Kitsweg (♂: 13-20.v.1989); Noord-Holland: Kwadijk (♀: 18-24.v.1989); Drenthe: Mantinge (4♂♂, 4♀♀: 19.v.1989); Groningen: Vlagtwedde (2♀♀: 22-23.v.1988); Weende (5♀♀: 22-23.v.1988).

This is the most common species of the Clusiidae present in the collection of the ZMA. Specimens were mainly deposited under *C. caledonicus* and *C. albimanus*.

The species is recorded from northern and central Europe and the northwestern part of the Russian Federation (Soós, 1984). *C. ruficollis* is associated with dead deciduous trees (Stubbs, 1982; as *C. fascialis*) and Withers (1985) mentions hornbeam (*Carpinus betulus* (L.)).

**Drosophilidae**

All species of the genus *Stegana* Meigen are very similar in appearance: thorax and legs with contrasting pale and black or brown parts, generally a black abdomen and conspicuously darkened wings, which are curved down in resting position, thus covering the whole abdomen. All *Stegana*-species seem to be associated with deciduous trees. Adults have been found on dead wood and sap streams and they have been reared from dead wood of various tree species.

*Stegana similis*

Material examined: Limburg: Gronsveld (Riesenberg: ♂: 2.vi.1991); Noord-Brabant: Udenhout (De Brand: 5♂♂, 7♀♀: 28.iv-4.viii.1990).

*Stegana similis* is the most common European species of the genus (Laštovka & Máca, 1982). Most recent European records are either from malaise traps or sweep catches around dead wood or from foliage in humid woodland. Unlike most species of *Drosophila* Fallén they are hardly attracted to bait. Some specimens have been collected on windows early in the morning which seems to indicate attraction by light.

*S. similis* is recorded from Britain (Chandler, 1987), Belgium (Grootaert et al., in press), Germany, Switzerland, Austria, Hun-

gary, Roumania, Czechoslovakia, Poland, Sweden, Finland and the northwestern part of the Russian Federation (Laštovka & Máca, 1982).

## Discussion

The conditions under which the material from the Riesenberg was collected were highly unusual. In the literature no references were found of such an accumulation of Diptera.

Horseflies (Diptera: Tabanidae) are often attracted to hot "black" surfaces like the opened windows of cars that have been parked in the sun (Timmer, 1980), but no horseflies were collected at the Riesenberg. To my knowledge no Empididae, Hybotidae or Clusiidae have ever been collected at or in hot cars.

I have observed soldierfly species (Diptera: Stratiomyidae) of the subfamily Sarginae in low numbers sitting down on the surface of a hot chalk gravel road in Ebbor Gorge (Somerset, England), probably to pick up more heat from the reflection of sunlight from the almost white pebbles and dust. However, now the flies were flying above the roadsurface and not sitting down on it while most of the road was in the shade.

Thus it seems likely that the attraction of the road surface to the recorded Diptera must have been of another kind than in the above mentioned examples. Predacious flies (Empididae, Hybotidae) may have been attracted by prey but that does not seem to be the case since no unusual numbers of very small insects were swept from above the road surface. Also, Empididae and Hybotidae usually drop their prey in the net after they have been swept, but there was no abandoned prey in the net. Furthermore, also non-predacious Diptera were swept: among the Diptera collected were pollen and nectar feeders, e.g. *Brachyopa scutellaris* Robineau-Desvoidy (Syrphidae), leaf dwellers that have been observed to feed on honeydew, e.g. *Chyliza leptogaster* (Panzer) and *Chamaepsila rosae* (Fabricius) (Psilidae) or bark dwellers, e.g. *Megamerina dolium* (Fabricius) (Megamerinidae).

The kind of attraction involved thus remains a mystery.

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