

**ČESKÁ ZEMĚDĚLSKÁ UNIVERZITA V PRAZE
FAKULTA AGROBIOLOGIE, POTRAVINOVÝCH A
PŘÍRODNÍCH ZDROJŮ**

Workshop on biodiversity, Jevany

Štěpán Kubík and Miroslav Barták (editors)

2013

**ČESKÁ ZEMĚDĚLSKÁ UNIVERZITA V PRAZE
FAKULTA AGROBIOLOGIE, POTRAVINOVÝCH A
PŘÍRODNÍCH ZDROJŮ**

Workshop on biodiversity, Jevany

Štěpán Kubík and Miroslav Barták (editors)

© Štěpán Kubík & Miroslav Barták

Reviewer: Doc. RNDr. Jan Minář, Dr.Sc.

Proceedings of the „Workshop on biodiversity”, Jevany,
2.-3.th July, 2013

This project was financially supported by

S grant of MSMT (Ministry of Education, Sports and Youth)

The workshop was organized under the auspices of the
Czech Academy of Agricultural Sciences, Department of
Animal Production

ISBN: 978-80-213-2424-4

Calliphoridae (Diptera) of Vráž nr. Písek (Czech Republic)

Hana Šuláková¹, Knut Rognes², Miroslav Barták³ & Štěpán Kubík³

¹ Institute of Criminalistics Prague, P.O. Box 62/KUP, Strojnicka 27, CZ-170 89 Prague 7; Czech Republic; e-mail: sulakova@centrum.cz

² University of Stavanger, Faculty of Arts and Education, Department of Early Childhood Education, NO-4036 Stavanger, Norway; e-mail: knut@rognes.no

³ Department of Zoology and Fisheries, Faculty of Agrobiolgy, Food and Natural Resources, Czech University of Life Sciences, CZ-165 21 Praha 6 - Suchdol, Czech Republic; e-mail: bartak@af.czu.cz, kubik@af.czu.cz

Abstract

Altogether 38 species of the family Calliphoridae are reported from Vráž nr. Písek, representing 80.9 % of all blow flies known from the Bohemia and 65.5 % of Calliphorid fly fauna of the Czech Republic. Three species found are listed in recent “Red list”, viz. *Angioneura acerba* (VU), *Angioneura fimbriata* (VU), and *Lucilia bufonivora* (VU). *Bellardia obsoleta* (Meigen, 1830) is recorded for the Czech Republic for the first time. The collecting methods for Calliphoridae are discussed and it is stated that a combination of quantitative methods is the best way to collect numerous material.

Key words: Diptera, Calliphoridae, Vráž nr. Písek, faunistics

1. Introduction

Adults are medium-sized to large robust flies with a body length from about 4.0 to 16.0 mm. Body colour variable, but most Central European species either black or metallic green to blue, often with silvery to yellowish microtomentum. Adult blow flies are important from a hygienic point-of-view. Their habit of visiting faeces, fresh or cooked meat, fish, dairy products, and wounds, make many species potential vectors of bacteria, viruses, protozoans and helminths. Several species have synanthropic tendencies. The larvae of *Protocalliphora* spp. feed on the blood of nestling birds. The known larvae of the Melanomyiinae are parasitoids or predators upon living snails. Species of the genera *Bellardia*, *Onesia* and *Pollenia* are associated with earthworms. A few Palaearctic species are obligate producers of myiasis in various animals.

Altogether 115 species of the family Calliphoridae are known to occur in Europe (Rognes 2013), of which 66 are listed in this checklist; 58 are recorded from the Czech Republic (47 in Bohemia, 57 in Moravia), and 62 from Slovakia. The identification of many Central European species is possible

using the detailed monographs treating the Scandinavian (Rognes 1991) or Polish fauna (Draber-Mońko 2004). The nomenclature follows the Fauna Europaea (Rognes 2013).

2. Material and Methods

2. 1. Description of locality

The locality is situated near Vráž nr. Písek. The Landa pond, which has a wide littoral zone, is found in the centre of this locality. The west and southwest areas of the pond are home to *Carex* spp and other types of wetland vegetation. Large areas surrounding the pond are made up of mixed forest and damp meadows containing many species of plants and grass.

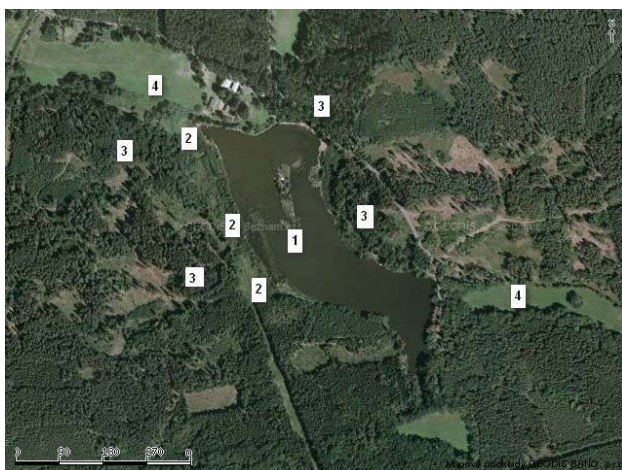


Fig. 1: (1-Landa pond, 2-littoral zone with wetland vegetation, 3-mixed wood, 4-damp meadow)

2. 2. Collecting methods

Since 1992, first year students of Faculty of Agrobiolgy, Food and Natural Resources have been attending the children's summer camp near Vráž nr. Písek for zoology field training. During the course of their field training, students take samples using various collecting methods:

- a) Sweeping vegetation
- b) Yellow pan water traps
- c) Malaise trap
- d) Emergence trap
- e) Pyramidal trap (described by Barták & Roháček 2011)

2. 3. Material

Materials obtained by all above mentioned methods were usually pooled together, so it is largely impossible to give precise method used in individual samplings. However, most species were collected by means of Malaise trap or pyramidal trap exposed above heaps of decaying wood baited with decaying meat. Precise numbers of specimens are not given because they represent morfospecies method selection from huge (mostly several litres) of materials. Specimens were identified mostly by H. Šuláková but partly by K. Rognes or Š. Kubík and they are deposited at Czech University of Life Sciences collections.

3. Results

List of species

- Angioneura acerba* (Meigen, 1838). Temperate and South European species. Immature stages and hosts are unknown. Dates: 18.vii.-22.viii.2008, 22.viii.-7.x.2009.
- Angioneura fimbriata* (Meigen, 1826). West Palaearctic species. Immature stages and hosts are unknown. Dates: 16.-20.vi.2008, 18.vii.-22.viii.2008, 20.-26.vi.2009, 22.viii.-7.x.2009, 19.-25.vi.2010.
- Bellardia obsoleta* (Meigen, 1830). West Palaearctic species. Larvae parasite earthworms. Dates: 12.v.1992, 1.vi.1992, 16.-20.vi.2008.
- Bellardia pandia* (Walker, 1849). Palaearctic species witch ascends upper subalpine line. Immature stages and host are unknown. Dates: 30.v.-3.vi.2005, 29.v.-2.vi.2006, 18.-22.vi.2007, 4.-23.vi.2011.
- Bellardia stricta* (Villeneuve, 1926). West Palaearctic species. Immature stages and host are unknown. Dates: 1.vi.1992, 30.v.-3.vi.2005.
- Bellardia vespillo* (Fabricius, 1794). Rare Palaearctic species. Apparently an early spring species. Immature stages and hosts are unknown. Date: 4.-24.vi.2011.
- Bellardia viarum* (Robineau-Desvoidy, 1830). A widespread Palaearctic species witch ascends to the subalpine zone. Hosts are unknown. Dates: 12.v.-1.vi.1992, 31.v.1993, 30.-31.v.1994, 30.v.-3.vi.2005, 16.-20.vi.2008, 22.v.-18.vi.2009, 20.-26.vi.2009, 19.vii.-10.viii.2010.
- Bellardia vulgaris* (Robineau-Desvoidy, 1830). A widespread Holarctic species witch ascends above tree-line. Larvae parasite earthworms. Date: 2.vi.-10.v.2011.
- Calliphora loewi* Enderlein, 1903. Asynanthropic Holarctic species. The adults collected on the stinkhorns fungus (*Phallus impudicus*) Dates: 27.-31.v.1996, 16.-20.vi.2008.

- Calliphora subalpina* (Ringdahl, 1931). Widespread Palaearctic species which ascends from low lands to the subalpine region. Larvae develop in carcasses and the adults are collected on the stinkhorns fungus (*Phallus impudicus*). Dates: 27.v.-2.vi.1996, 16.-20.vi.2008, 20.-26.vi.2009, 22.viii-7.x.2009, 19.-25.vi.2010, 10.viii.-19.x.2010.
- Calliphora vicina* Robineau-Desvoidy, 1830. Very common and cosmopolitan species distributed through Palaearctic region which ascends up to high alpine zone. Larvae develop in carcasses and in nests of birds, also involved in cases of myiasis; forensically important species. Dates: 30.v.-3.vi.2005, 29.v.-2.vi.2006, 19.vii.-10.viii.2010.
- Calliphora vomitoria* (Linnaeus, 1758). Very common and cosmopolitan species; ascends to the high alpine zone. Larvae develop in carcasses and involved in cases of myiasis; forensically important species. The adults are attracted to stinkhorns fungus (*Phallus impudicus*). Dates: 2.vi.1993, 27.v.-2.vi.1996, 22.viii.-7.x.2009, 28.iv.-24.v.2010, 14.ix.-19.x.2010, 24.vi.-2.vii.2011.
- Cynomya mortuorum* (Linnaeus, 1761). Widespread Holarctic species which ascends to Alpine zone. The adults are attracted to faeces, dung and carcasses. Dates: 27.-31.v.1996, 16.-20.vi.2008, 18.-23.vi.2011.
- Eurychaeta palpalis* (Robineau-Desvoidy, 1830). Palaearctic species. Females lay a single larva once every two weeks. Larvae develop in dead snails. Dates: 20.-26.vi.2009, 19.vii.-10.viii.2010, 10.v.-24.vi.2011, 14.vi.-25.ix.2013.
- Lucilia ampullacea* Villeneuve, 1922. Palaearctic species also distributed in Oriental and Australian regions. The adults are attracted to faeces, overripe fruit and stinkhorns fungus (*Phallus impudicus*). Dates: 16.-20.vi.2008, 22.viii.-7.x.2009, 10.viii.-19.x.2010.
- Lucilia bufonivora* Moniez, 1876. Palaearctic species which ascends from low lands to the mountains. An obligatory parasite of amphibians, mainly frogs (toads). Date: 37.v.-2.vi.1996.
- Lucilia caesar* (Linnaeus, 1758). Widespread Palaearctic species which preferred bushy biotope. Larvae develop in carcasses; forensically important species. Dates: 4.vi.1992, 22.-25.v.1995, 27.-2.vi.1996, 30.v.-3.vi.2005, 29.v.-2.vi.2006, 18.-22.vi.2007, 16.-20.vi.2008, 18.vii.-22.viii.2008, 7.x.-2.xii.2009, 25.vi.-19.vii.2010, 14.ix.-19.x.2010, 14.vi.-25.ix.2013.
- Lucilia illustris* (Meigen, 1826). Widespread Holarctic species. Larvae develop in carcasses; forensically important species. Date: 16.-20.vi.2008.
- Lucilia silvarum* (Meigen, 1826). Holarctic species. Larvae develop in carcasses and are involved in cases of myiasis of reptiles and frogs. Dates: 30.v.1994, 27.v.-2.vi.1996, 16.-20.vi.2008, 18.vii.-22.viii.2008, 18.vi.-18.vii.2009, 18.-23.vi.2011.

- Melinda gentilis* Robineau-Desvoidy, 1830. Holarctic species. Larvae parasite snails. Dates: 16.-20.vi.2008, 18.vii.-22.viii.2008, 19.vii.-10.viii.2010, 24.vi.-2.viii.2011.
- Melinda viridicyanea* (Robineau-Desvoidy, 1830). West Palaearctic species, frequently encountered in the Czech Republic. Dates: 11.v.1992, 22.-25.v.1995, 27.v.-2.vi.1996, 30.v.-3.vi.2005, 18.-22.vi.2007, 16.-20.vi.2008, 18.vii.-22.viii.2008, 18.vi.-18.vii.2009, 22.viii.-7.x.2009, 24.iii.-28.iv.2010, 19.-19.vii.2010, 10.viii.-14.ix.2010, 2.iv.-24.vi.2011, 2.viii.-27.x.2011, 6.vi.-25.viii.2012.
- Morinia doronici* (Scopoli, 1763). European species, known from several records from the Czech Republic (as *Morinia melanoptera* Fallén). Dates: 4.-27.x.2011, 30.iv.-6.vi.2012.
- Onesia floralis* Robineau-Desvoidy, 1830. Temperate European species. Larvae likely parasite earthworms; data need revision. Dates: 12.v.1992, 30.v.1994, 22.-25.v.1995, 8.-14.vi.1995, 27.v.-2.vi.1996, 18.-22.vi.2007, 2.iv.-10.v.2011, 18.-23.vi.2011, 2.viii.-27.x.2011.
- Phormia regina* (Meigen, 1826). Holarctic species. Larvae develop in carcasses and garbage; forensically important species. Date: 20.-26.vi.2009.
- Pollenia amentaria* (Scopoli, 1763). European species which ascends from low lands to the subalpine zone (800 m amsl). Immature stages and host are unknown. Dates: 16.-20.vi.2008, 24.iii.-28.iv.2010, 2.iv.-10.v.2011, 18.-23.vi.2011.
- Pollenia griseotomentosa* (Jacentkovský, 1944). Widespread European species. Immature stages and host are unknown. Dates: 1.-5.vi.1992, 22.v.1995, 24.v.1995, 27.v.-2.vi.1996, 30.v.-3.vi.2005, 18.-22.vi.2007, 16.-20.vi.2008, 22.viii.-2.xii.2009, 24.iii.-28.iv.2010, 19.-25.vi.2010, 10.viii.-14.ix.2010, 2.iv.-10.v.2011, 4.-24.vi.2011.
- Pollenia hungarica* Rognes, 1987. Widespread European species. Larvae parasite earthworms. Dates: 18.-22.vi.2007, 22.viii.-7.x.2009, 18.-23.vi.2011.
- Pollenia labialis* Robineau-Desvoidy, 1863. Widespread Holarctic species, common in the Czech Republic. Immature stages and host are unknown. Dates: 31.v.1993, 30.v.-3.vi.2005, 22.viii.-2.xii.2009, 14.ix.-19.x.2010, 2.iv.-10.v.2011, 2.viii.-27.x.2011.
- Pollenia mayeri* Jacentkovský, 1941. Temperate European species. Immature stages and host are unknown. Dates: 24.v.1995, 18.-22.vi.2007, 18.vi.-18.vii.2009, 24.iii.-28.iv.2010, 10.viii.-14.ix.2010, 2.iv.-10.v.2011, 2.-24.vi.2011.
- Pollenia moravica* (Jacentkovský, 1941). West Palaearctic species. Immature stages and host are unknown. Dates: 12.v.1992, 1.-5.vi.1992, 18.-22.vi.2007, 16.-20.vi.2008, 19.-25.vi.2010, 10.v.-23.vi.2011.

- Pollenia pediculata* Macquart, 1834. Common and widespread Holarctic species. Larvae parasite earthworms. Dates: 30.v.-3.vi.2005, 18.-22.vi.2007, 16.-20.vi.2008, 7.x.-2.xii.2009.
- Pollenia rudis* (Fabricius, 1794). Holarctic species also distributed in Oriental and Australian regions. Larvae parasite earthworms. Dates: 18.-22.vi.2007, 16.-20.vi.2008, 19.-25.vi.2010, 18.-23.vi.2011.
- Pollenia similis* (Jacentkovský, 1941). Temperate and South European species. Immature stages and host are unknown. Dates: 18.-22.vi.2007, 16.-20.vi.2008.
- Pollenia tenuiforceps* Séguéy, 1928. Temperate European species. Immature stages and host are unknown. Date: 4.-24.vi.2011.
- Pollenia vagabunda* (Meigen, 1826). Holarctic species. Immature stages are unknown. Host possibly butterfly larvae. Date: 22.viii.-7.x.2009.
- Pollenia vera* Jacentkovský, 1936. European species. Immature stages and host are unknown. Date: 7.x.-2.xii.2009.
- Protocalliphora azurea* (Fallén, 1817). Common Palaearctic species distributed to Japan; ascends to the subalpine zone. Larvae are obligatory external blood-suckers of nestling birds. Date: 27.-31.v.1996.
- Protophormia terranova* (Robineau-Desvoidy, 1830). Holarctic species. Larvae develop in carcasses and involved in cases of myiasis; forensically important species. Dates: 29.v.-2.vi.2006, 24.iii.-28.iv.2010.

4. Conclusions and discussion

Altogether 38 species of family Calliphoridae are reported from Vráž nr. Písek, representing 80.9 % (47 totally) of all blow flies known from the Bohemia and 65.5 % (58 totally) of the fauna of the Czech Republic (Kubík & Országh 2009).

Comparing species spectrum of the family Calliphoridae from Vráž with that from previous complex researches of Diptera organized by similar team of specialists: BR Pálava – 35 species, Bílina and Duchcov environs – 31 species, NP Podyjí – 38 species, Pořana – 13 species, respectively (Gregor & Rozkošný 1999, Pape et al. 2001, Kubík & Barták 2005, Šuláková et al. 2009, respectively), it is a similar number of species.

Bellardia obsoleta is recorded from the Czech Republic for the first time. The species is known from neighbouring areas, viz. Germany, Poland and Slovakia as well as from France and Spain, but see Rognes (2002) for details.

Three species found are listed in recent “Red list” (Kubík & Povolný 2005), viz. *Angioneura acerba* (VU), *Angioneura fimbriata* (VU) and *Lucilia bufonivora* (VU).

Members of family Calliphoridae are generally frequently collected. Quantitative collecting methods (Malaise traps, baited pyramidal traps, yellow pan traps, flight intercept traps) are effective; however, the best way to collect numerous materials is combination of all these methods.

5. Acknowledgements

This paper was supported by S grant of MSMT (Ministry of Education, Sports and Youth) and the project No. VF20102014001 of Ministry of the Interior of the Czech Republic.

6. References

- Barták M. & Roháček J. 2011: Records of interesting flies (Diptera) attracted to meat baited pyramidal trap on sapping stump of European walnut (*Juglans regia*) in Central Bohemia (Czech Republic). *Časopis slezského zemského muzea (A)*, 60 (3): 223-233.
- Draber-Moňko A. 2004: Calliphoridae. Plujky (Insecta: Diptera). *Fauna Polski* **23**, Warszawa: 1-662.
- Gregor F. & Rozkošný R. 1999: Calliphoridae, Rhinophoridae. In Rozkošný R. & Vaňhara J. (eds): Diptera of the Pálava Biosphere Reserve of UNESCO. Vol. 2. *Folia Facultatis Scientiarum Naturalium Universitatis Masarykianae Brunensis*, *Biologia*, **100**: 403-410.
- Kubík Š. & Barták M. 2005: Calliphoridae. In Barták M. & Kubík Š. (eds): Diptera of Podyjí National Park and its Environs. Česká zemědělská univerzita, Praha: 389-392.
- Kubík Š. & Országh I. 2009: Calliphoridae Brauer & Bergenstamm, 1880. In Jedlička L., Kúdela M. & Stloukalová V. (eds): Checklist of Diptera of the Czech Republic and Slovakia. Electronic version 2. <<http://zoology.fns.uniba.sk/diptera2009>> Accessed 1.10.2013.
- Kubík Š. & Povolný D. 2005: Calliphoridae (bzučivkovití). In Farkač J., Král D. & Škopík M. (eds): Červený seznam ohrožených druhů České republiky. Bezobratlí. Red list of threatened species in the Czech Republic. Invertebrates. Agentura ochrany přírody a krajiny ČR, Praha: 363-364.
- Pape T., Kubík Š. & Barták M. 2001: Calliphoridae. In Barták M & Vaňhara J.(eds): Diptera in an Industrially Affected Region (North Western Bohemia, Bílina and Duchcov Environs) II. *Folia Facultatis Scientiarum Naturalium Universitatis Masarykianae Brunensis*, *Biologia*, **105**: 479-484.
- Rognes K. 1991: Blowflies (Diptera, Calliphoridae) of Fennoscandia and Denmark. *Fauna entomologica Scandinavica* **24**: 1-272.

- Rognes, K. 2002: Separate status for *Bellardia pruinosa* (Enderlein, 1933) (Diptera, Calliphoridae). *Studia dipterologica*, **9** (1): 349-354.
- Rognes K. 2013: Fauna Europaea: Calliphoridae In: Pape T. (ed.): *Fauna Europaea: Diptera, Brachycera*. Fauna Europaea version 2.6.2. <http://www.faunaeur.org>, most data not changed since 2010. Accessed 01.10.2013.
- Šuláková H., Kubík Š., Barták M. & Roháček J. 2009: Calliphoridae. In Roháček J. & Ševčík J. (eds): *Diptera of the Poľana Landscape Area – Biosphere Reserve (Central Slovakia)*. SNC SR, Administration of the PLA – BR Poľana, Zvolen: 299-300.