Zootaxa 4171 (1): 191–195
http://www.mapress.com/j/zt/

Correspondence

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

http://doi.org/10.11646/zootaxa.4171.1.12
http://zoobank.org/urn:lsid:zoobank.org:pub:FC46DE87-F139-4FD6-8D3C-2802B82217D1

The identity of *Calliphora bezzii* Zumpt, 1956 (Diptera, Calliphoridae)

KNUT ROGNES
University of Stavanger, Faculty of Arts and Education, Department of Early Childhood Education, NO-4036 Stavanger, Norway.
E-mail: knut@rognes.no

The holotype male of a nominal species described from Italy, *Calliphora bezzii* Zumpt, 1956, including a microscope slide of its terminalia, was examined. The holotype is shown to belong to the Nearctic taxon *Calliphora latifrons* Hough, 1899. Thus, *Calliphora bezzii* is a junior synonym of *C. latifrons*, **syn. nov.**

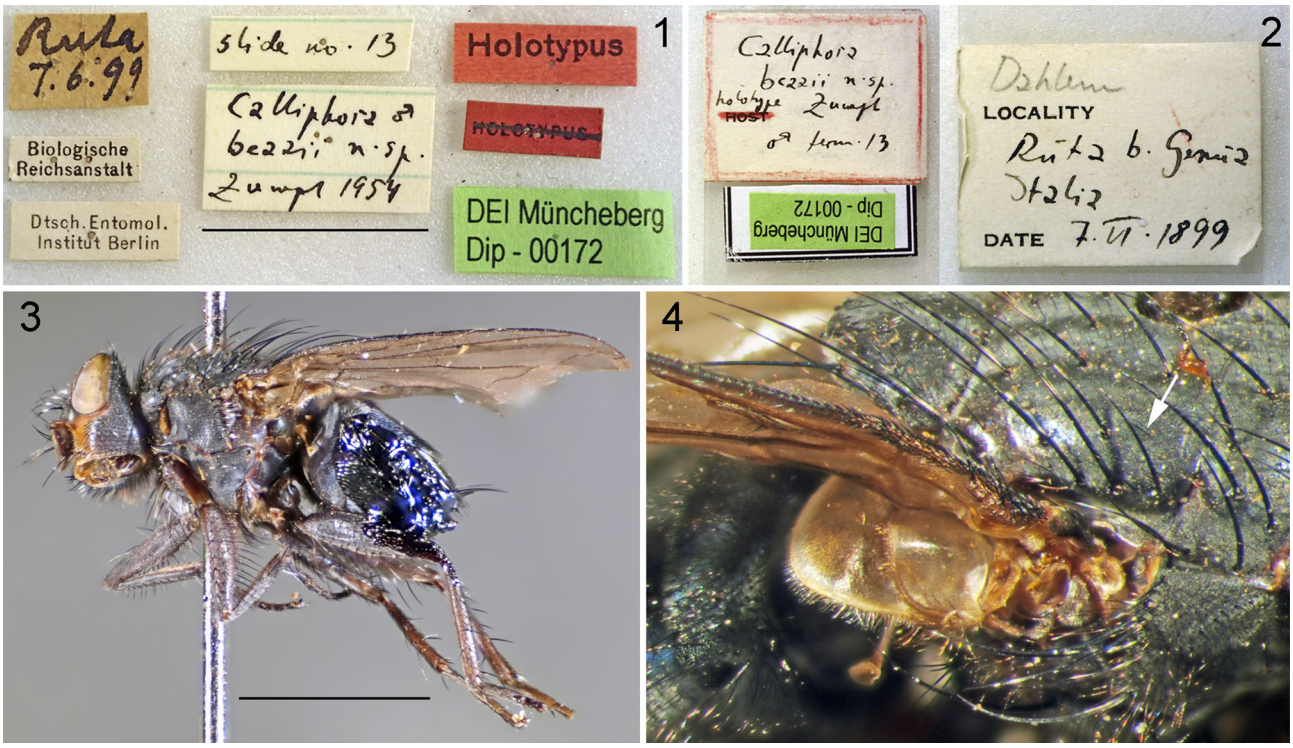
Zumpt (1956: 16) described *Calliphora bezzii* on the basis of two males in the Oldenberg collection in "Dtsch. Ent. Institut, Berlin", now Senckenberg Deutsches Entomologische Institut (SDEI), Müncheberg, Germany. He found it remarkable because of an "auffallende breite Stirn … und merkwürdig geformte, am Ende abgestutzte Paralobi … [strikingly broad frons … and oddly shaped, distally blunt surstyli]". The specimens were captured at "Ruta" on the 7th of June 1899, but the collector was not given on any of the labels. Zumpt consulted "Prof. Dr. W. Hennig" (at SDEI at the time) about the origin of the specimen and Hennig concluded, on the basis of the type of paper of the locality label, that "… [e]s bleibt also kaum ein Zweifel dass es sich um den Fundort "Ruta" bei Genua handelt, und dass das Tier von Bezzi stammt. [… There is thus no doubt that the locality is "Ruta" near Genova, and that the specimen originates from Bezzi.]". Zumpt gave a thorough description of the two syntypic males and included illustrations of the dissected genitalia in three figures (Zumpt 1956: 17, Textfig. 11). One of the specimens was returned to SDEI in these words by Zumpt (1956: 17): "Der Holotypus wurde an das Dtsch. Ent. Institut zurückgesandt, die Paratype dankenswerterweise dem South African Institute for Medical Research überlassen. [The holotype was returned to Dtsch. Ent. Institut, the paratype thankfully donated to the South African Institute for Medical Research.]". The last cited sentence by Zumpt amounts to fixation of a holotype by original designation (ICZN, Article 73.1.1).

Since its description, no one has recorded new material of *Calliphora bezzii*. I included it as an Italian endemic in the checklist of the Calliphoridae of Italy (Pape *et al*. 1995, as "*Calliphora bezzi*"), and listed it from the Italian mainland in the Fauna Europaea database (Rognes 2013, as "*Calliphora bezzi*"). It is surprising that a supposedly genuinely European species should not have been collected again. The terminalia illustrations published by Zumpt (1956) are strongly suggestive of the terminalia of a Nearctic species, i.e. *Calliphora latifrons* Hough, 1899, of which I have several males and females in my personal collection. The aim of this paper is to argue that *Calliphora bezzii* Zumpt is a junior synonym of *C. latifrons* Hough, and not an Italian endemic species.

The holotype of *C. bezzii*, including the dissected terminalia on a slide, was borrowed from SDEI for examination. The labels pinned below the holotype are shown in Fig. 1. The paratype in "South African Institute for Medical Research" (NMSA, now Kwazulu-Natal Museum, Pietermaritzburg) could not be found (B. Muller, personal communication, 16 March 2016) and may possibly be lost. The habitus of the holotype is shown in Fig. 3. It is in fair condition but shows a large "wet" area on the left side of the abdomen, apparently originating from use of a fluid associated with Zumpt's method of removal of the terminalia from the tip of the abdomen. The terminalia are mounted, flattened, on a microscope slide. The labels on the slide are shown in Fig. 2.

For comparison I examined four males (one dissected) and five females of *Calliphora latifrons* Hough from the USA (Oregon, Washington, and Wyoming) in my collection. These were identified by the use of Hough (1899), Hall (1948) and Whitworth (2006). The label data for the specimens are (lines on labels are separated by single slashes or by a double slash if slashes are already used in label lines; labels numbered from top of pin): 1 ♂ (dissected), 1 ♀: (1) Wash. Pierce Co. // Tacoma // 7 / 99 // T.L.Whitworth; (2) Calliphora latifrons / det. Whitworth; 1 ♂: (1) OREGON: L. Lick Crk., 26 / mi. SE Union, 4280 ft., / Union Co., E. J. Davis / VI – (9-12) – 1976 / Malaise baited with CO_2; (2) Calliphora latifrons / det. Whitworth; 1 ♀: (1) OREGON: U. Goose Crk., 34 / mi. SE Union, 4160 ft., / VIII – (7-9) – 1977 / Malaise baited with CO_2; (2) Calliphora latifrons / det. Whitworth; 1 ♂, 3 ♀: (1) Snake River / 6800 ft; (2) USA: Wyoming: / Flagg Ranch / 22.viii.1994 / A. C. Pont; 1 ♂: (1) Amphitheater / Lake 9700 ft; (2) USA, Wyoming: / Grand Teton NP / 21.viii.1994 / A. C. Pont [all specimens in my personal collection].

Accepted by D. Whitmore: 24 Aug. 2016; published: 27 Sept. 2016



FIGURES 1–4. *Calliphora latifrons* Hough (holotype ♂ of *Calliphora bezzii* Zumpt). **1.** Labels on pinned specimen. **2.** Labels on microscope slide of terminalia. **3.** Habitus. **4.** Area around right wing base. Scale bars: 1.7 cm (Fig. 1), 4 mm (Fig. 3).

Terminology follows Rognes (1991), except "phallus", which is used in place of "aedeagus".

Hough (1899) distinguished *Calliphora latifrons* from other Nearctic *Calliphora* species on the basis of the following characters: (1) "bucca" [genal dilation] black; (2) "beard" [genal dilation and postgenal vestiture] black; (3) two postsutural intra-alar setae, with a third seta anterior to these being minute or absent (Hough counted the intra-alar setae from the posteriormost, thus denoting the minute seta as "3d post i.a."); (4) frons width "at vertex (which is the narrowest part) one-fourth of width of head"; (5) a second large pair of ocellar setae present just posterior to the posterior ocelli. Hall (1948, as "*Eucalliphora lilaea* Walker") followed Townsend (1908: 118) in assigning *C. latifrons* to *Eucalliphora* Townsend, 1908, based on the presence of two pairs of strong ocellar setae. Hall (1948: 206) diagnosed (in a key) *C. latifrons* also on the presence of strong ascending setae on the facial ridge, reaching as far as half the distance to lunula (Hall 1948: 384, pl. 6B). Both Hall (1948: 426, pl. 27A, B) and Hardy (1981: 291, fig. 130, a–c) illustrated the male terminalia. Whitworth (2006) summarised the characters defining *C. latifrons*, keyed it among thirteen Nearctic *Calliphora* species, and included a description of the colour of the upper and lower calypters.

Below, I compare the holotype of *C. bezzii* with four males of *C. latifrons*, the terminalia of one of which were dissected.

Frons width. In the dissected male of *C. latifrons* the ratio of frons width at narrowest point / head width is 0.23 (Fig. 5). In the holotype of *C. bezzii* this ratio is 0.24 (Fig. 8). Whitworth (2006) gives a mean of 0.24 and a range of 0.22–0.26 (n = 12).

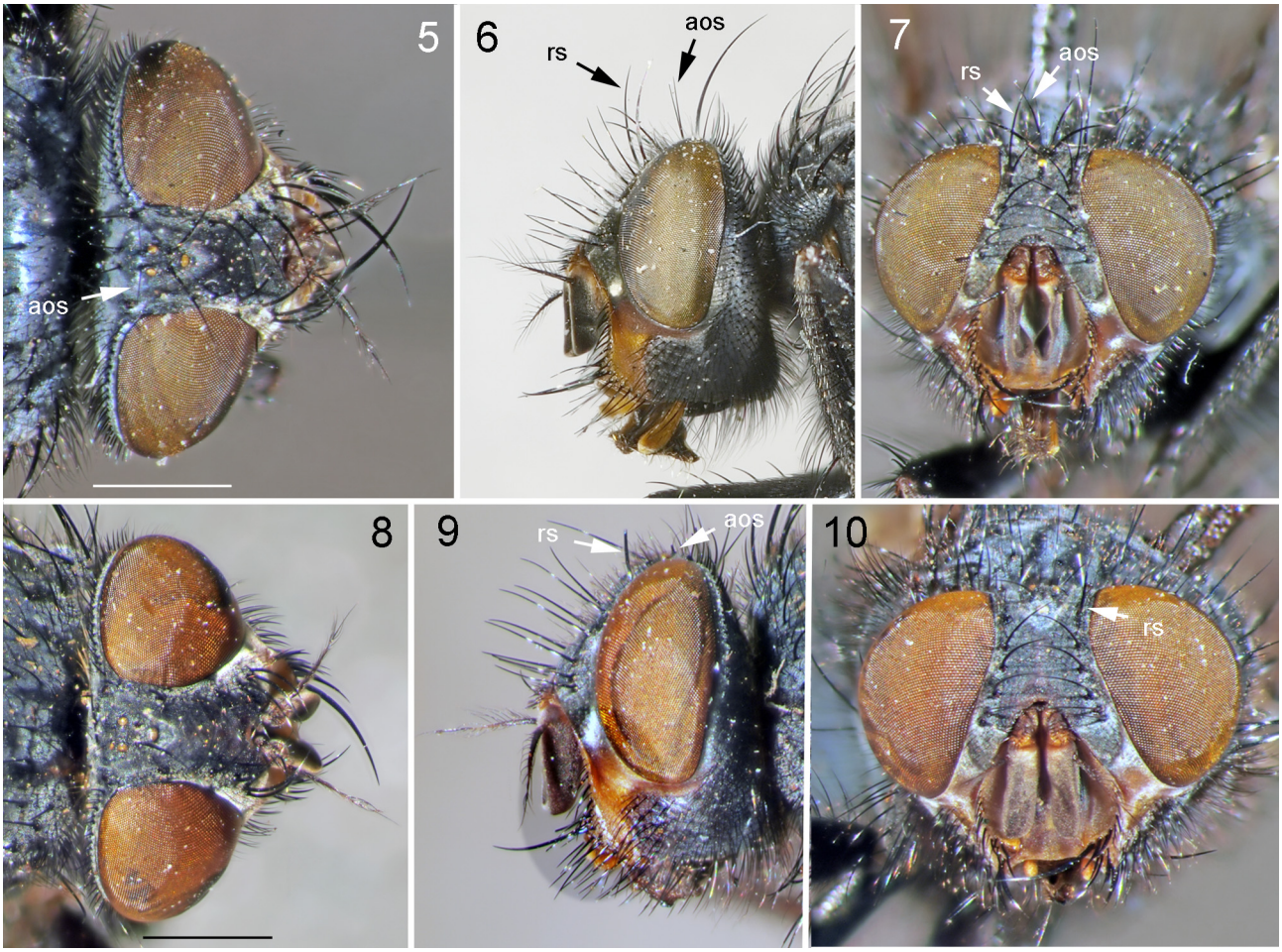
Colour of genal dilation and postgena. These are black in all examined males of *C. latifrons* (Fig. 6), and also in the holotype of *C. bezzii* (Fig. 9). The vestiture is also black.

Strong setae on facial ridge. These are shown in Fig. 6 for the *C. latifrons* from Tacoma, and in Fig. 9 for the holotype of *C. bezzii*. They are not quite as numerous in the holotype as in the Tacoma specimen, but clearly the setae are strong.

Accessory ocellar setae. A pair of strong, diverging, accessory ocellar setae is present behind the usual pair of ocellar setae in *C. latifrons*, situated just posterior to the posterior ocelli (Figs 5–7, *aos*). In the holotype of *C. bezzii* the right accessory seta is lost, but its socket is visible (Fig. 8, just medial to the yellow spot behind the right posterior ocellus). On the left side, a small stub of the broken left accessory ocellar seta is just visible (Fig. 9, *aos*).

Strong reclinate prevertical seta. At the posterior end of the row of frontal setae in *C. latifrons* there is a pair of quite strong, reclinate prevertical setae (Figs 6–7, *rs*), also mentioned by Zumpt (1956). In the holotype of *C. bezzii* the reclinate prevertical seta on the right side is lost, though a large socket at its base remains. On the left side the reclinate

prevertical seta is broken, but its basal part remains and it is clearly stronger than the frontal setae anterior to it (Figs 9–10, *rs*).



FIGURES 5–10. 5–7. *Calliphora latifrons* Hough (male from USA, Washington, Tacoma). **8–10.** *Calliphora latifrons* Hough (holotype ♂ of *Calliphora bezzii* Zumpt). **5, 8.** Head in dorsal view. **6, 9.** Head in left lateral view. **7, 10.** Head in frontal view. Abbreviations: *aos* = accessory ocellar seta; *rs* = reclinate prevertical seta. Scale bars: 1 mm (Figs 5, 8).

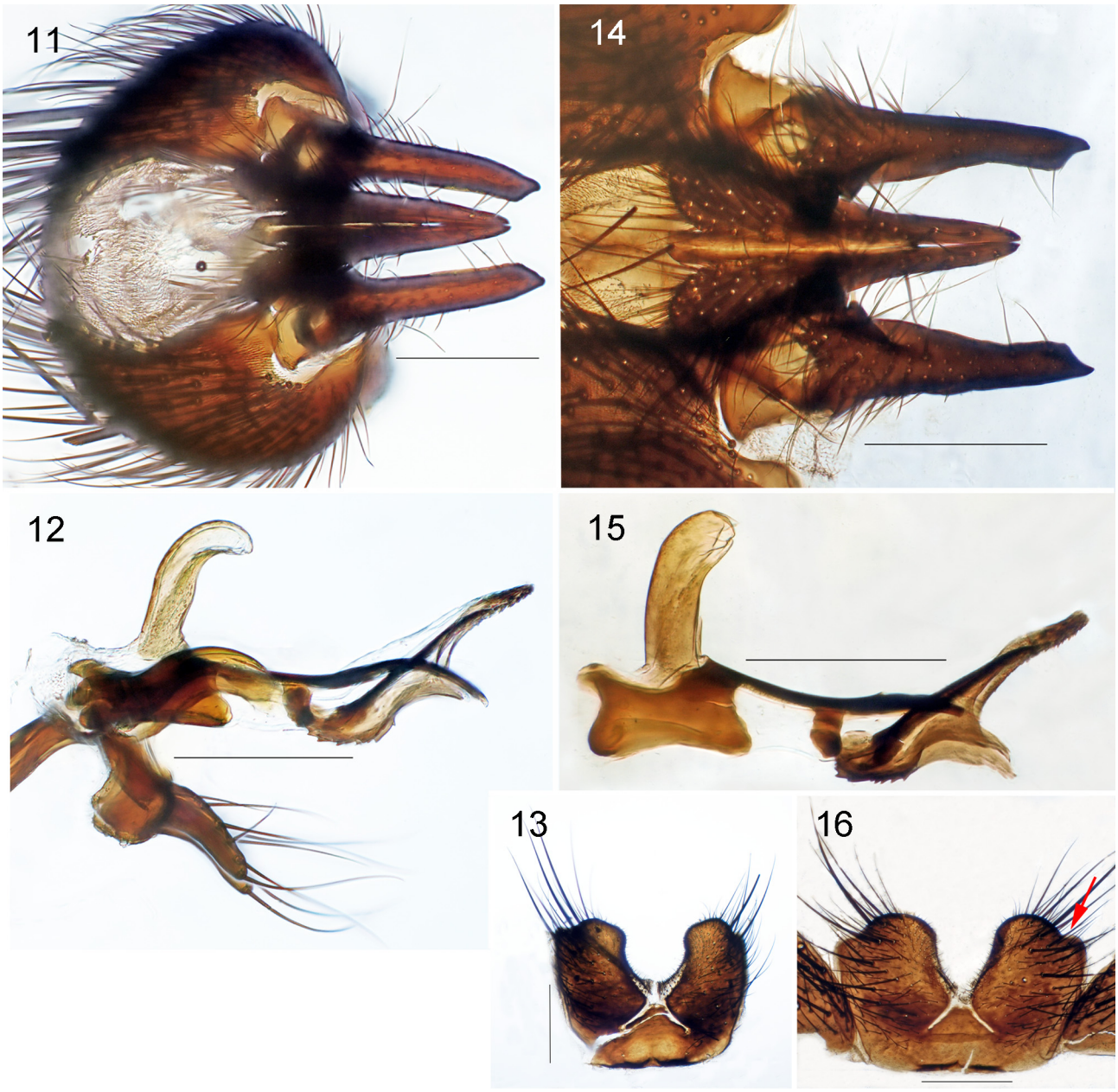
Colour of lower and upper calypters. The upper calypter is brown with an even darker rim in all examined Nearctic specimens of *C. latifrons*, as well as in the holotype of *C. bezzii*. The rim carries dark hairs. The lower calypter is also brown in these specimens, but there is a conspicuous pale area just in front of the pale rim (Fig. 4). The rim carries white hairs.

Intra-alar setae. All four of the Nearctic specimens of *C. latifrons* have two strong postsutural intra-alar setae. One male has a minute, additional seta anterior to these two setae on both sides, while in another male this minute seta is present on one side only. In the two remaining males there is no trace of such an additional seta. In the holotype of *C. bezzii* this minute seta anterior to the two strong intra-alar setae is present only on the right side (Fig. 4, arrow).

Cerci and surstyli. Figure 11 shows the cerci and surstyli in their natural position in the dissected male from Tacoma. Figure 14 shows the same parts as they appear on Zumpt's slide of the holotype of *C. bezzii*, flattened beneath a coverslip. The cerci converge distally, are much shorter than the surstyli, and the surstyli have a very characteristic, obliquely blunted tip. They fit well with the illustrations by Hall (1948: 426, fig. 27B, C).

Phallus. Figure 12 shows the phallus (including the pre- and postgonites) of the Tacoma specimen. Figure 15 shows the flattened phallus on Zumpt's slide of the *C. bezzii* holotype. Important and common features are the stout epiphallus, the short ventral plate of the distiphallus, the short hypophallic lobe with rather few (5–6) denticles, the concave ventral edge of the hypophallic lobe in profile, the drawn-out and pointed distal part of the hypophallic lobe, and the upturned distal part of the distiphallus.

ST5. The fifth abdominal sternite of the Tacoma male is shown in its natural, uncompressed state in Fig. 13, whereas the same structure of the holotype of *C. bezzii* is shown in Fig. 16. Both share the concave inner margin of the distal lobes, and the small lateral nick on the distal edge of each lobe (Fig. 16, red arrow).



FIGURES 11–16. 11–13. *Calliphora latifrons* Hough (male from USA, Washington, Tacoma). **14–16.** *Calliphora latifrons* Hough (holotype ♂ of *Calliphora bezzii* Zumpt). **11, 14.** Cerci and surstyli in posterior view. **12, 15.** Phallus (pre- and postgonites included in Fig. 12). **13, 16.** Fifth abdominal sternite. Scale bars: 0.25 mm (Figs 11–12, 14–15), 0.5 mm (Figs 13, 16).

Conclusions. On the basis of the characters discussed above, the holotype of *C. bezzii* clearly belongs to the same taxon as the four Nearctic males of *Calliphora latifrons* examined by me. The problem remains as to how *C. latifrons* arrived in Ruta (Genova province, Camogli, Italy) in 1899, the date on its original label. The normal distribution of the species covers western North America, from Alaska to Ontario south to Northern Mexico and Colorado. The only explanation that comes to mind is an accidental introduction via the harbour of Genova (about 25 km from Ruta), a busy place and a centre of international trade for many centuries. *Calliphora latifrons* is considered as introduced in Hawaii, where the oldest record dates from June 1922 (Hardy 1981, as "*Eucalliphora lilaea*"). Interestingly, *C. latifrons* has recently also been reported as new to the Chinese fauna (Fei *et al.* 2009; Liang *et al.* 2009), assumed to have been brought into the country via ships arriving in ports. It was first captured in 2008 in Guangzhou province, Southern China, by Ge-Qiu Liang (Zhongshan University, Guangzhou) (personal communication, 25 June 2008). Possibly it will soon arrive also elsewhere.

Nomenclatural summary

Calliphora latifrons Hough, 1899

Calliphora latifrons Hough, 1899: 286. Type locality: USA (Idaho, Moscow). Lectotype ♂, designated by Hall (1948: 286).

Eucalliphora latifrons: Townsend (1908: 118).

Eucalliphora lilaea: Hall (1948: 284), Hardy (1981: 290). Misidentification, not *Musca lilea* Walker [= *Cynomya cadaverina* Robineau-Devoidy, *teste* Thompson & Pont (1994)].

Eucalliphora arta Hall, 1948: 287. Synonym according to Whitworth (2006: 698). Type locality: Mexico (San Luis Potosi). Holotype ♂ ("Type"), by original designation.

Calliphora bezzii Zumpt, 1956: 16. **Syn. nov.** Type locality: Ruta, Italy. Holotype ♂, by original designation.

Calliphora bezzi: Rognes *in* Pape *et al*. (1995), Rognes (2013). Incorrect subsequent spelling of *bezzii* Zumpt.

Calliphora latifrons: Whitworth (2006: 703).

I would like to thank Frank Menzel (SDEI) for loan of material; Burgert Muller (NMSA) for searching for the *C. bezzii* paratype; Universitetsbiblioteket, Universitetet i Stavanger, for help with Chinese literature; and the reviewers James F. Wallman (Wollongong, New South Wales, Australia) and Terry L. Whitworth (Puyallup, Washington, USA) for useful comments.

References

Fei, X.-D., Liang, L.-Q., Xue, G.-D. & Xue, W.-Q. (2009) Description of *Calliphora latifrons* intercepted from Guangzhou Port, China (Diptera: Calliphoridae). *Acta Parasitologica et Medica Entomologica Sinica*, 16, 177–180. [in Chinese with English summary]

Hall, D.G. (1948) *The blowflies of North America*. Thomas Say Foundation, Lafayette, Indiana, 6 + 477 pp., 46 pls.

Hardy, D.E. (1981) *Insects of Hawaii. Vol. 14. Diptera: Cyclorrhapha IV*. The University Press of Hawaii, Honolulu, 491 pp.

Hough, G. de N. (1899) Synopsis of the Calliphorinae of the United States. *Zoological Bulletin*, 2, 283–290. http://dx.doi.org/10.2307/1535440

International Commission on Zoological Nomenclature (1999) *International Code of Zoological Nomenclature. 4th Edition. Adopted by the International Union of Biological Sciences.* International Trust for Zoological Nomenclature, London, xxix + 306 pp.

Liang, G.-Q., Xue, W.-Q., Zhang, C.-T. & Jia, F.-L. (2009) *Calliphora latifrons* Hough and *Calliphora vicina* Robineau-Desvoidy, two introduced blowflies to Guangzhou. *Journal of Environmental Entomology*, 31, 392–394. [in Chinese with English summary]

Pape, T., Richter, V., Rivosecchi, L. & Rognes, K. (1995) Diptera Hippoboscoidea, Oestroidea. *In*: Minelli, A., Ruffo, S. & La Posta, S. (Eds.), *Checklist delle Specie della Fauna Italiana*, 78. Calderini, Bologna, pp. 1–33. Avaliable from: http://www.faunaitalia.it/checklist/introduction.html (Accessed 26 Sept. 2016)

Rognes, K. (1991) Blowflies (Diptera, Calliphoridae) of Fennoscandia and Denmark. *Fauna Entomologica Scandinavica*, 24, 1–272.

Rognes, K. (2013) Fauna Europaea: Calliphoridae. *In*: Pape, T. & Beuk, P. (Eds.), *Fauna Europaea: Diptera, Brachycera*. Fauna Europaea version 2.6. Available from: http://www.fauna-eu.org/cdm_dataportal/taxon/c9fb8a8a-ea4d-4b6d-9592-c4bf4a8b14eb (accessed 5 May 2016)

Thompson, F.C. & Pont, A.C. (1994) Systematic database of *Musca* names (Diptera). *Theses Zoologicae*, 20 [1993], 1–219 (+ postscript of 2 unnumbered pages).

Townsend, C.H.T. (1908) The taxonomy of the muscoidean flies, including descriptions of new genera and species. *Smithsonian Miscellaneous Collections*, 51 (2), 2 + 1–138.

Whitworth, T. (2006) Keys to the genera and species of blow flies (Diptera: Calliphoridae) of America north of Mexico. *Proceedings of the Entomological Society of Washington*, 108, 689–725.

Zumpt, F. (1956) 64i. Calliphorinae. *In*: Lindner, E. (Ed.), *Die Fliegen der Palaearktischen Region. Band 11 [Lieferungen 190, 191, 193]*. Schweizerbart'sche Verlagsbuchhandlung (Nägele u. Obermiller), Stuttgart, 140 pp.