

***Carcelia laxifrons* Villeneuve (Tachinidae) new to Britain and a revised key to the British *Carcelia* species**

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Summary

Carcelia laxifrons Villeneuve, 1912 is added to the British list based on reared material and a revised key for the British *Carcelia* species is presented.

Introduction

Wyatt & Sterling (1988) introduced *Townsendiellomyia nidicola* (Townsend) (Tachinidae) and *Parasarcophaga uliginosa* (Kramer) (Sarcophagidae) to the British list based on material reared from the Brown-tail moth (*Euproctis chryorrhoea*) (Lepidoptera, Lymantriidae) collected from various sites in southern England. Other tachinid parasitoids reared included *Compsilura concinata* (Meigen), *Pales pavidata* (Meigen) and a series of 10 specimens from Dungeness in Kent identified as *Carcelia lucorum* (Meigen) using Van Emden (1954).

C. lucorum will parasitise a wide variety of lepidopterous hosts (Ford & Shaw 1991), but appears to have a preference for hosts in the family Arctiidae. During discussions regarding the identity of various British tachinids, Peter Tschorsnig (*pers. comm.*) commented that the record of *C. lucorum* from *E. chryorrhoea* was unusual. It was suggested that it would be more typical of *Carcelia laxifrons* Villeneuve, for which *E. chryorrhoea* is a well-known host.

In light of these comments, the *Carcelia* specimens of Wyatt & Sterling (1988) were re-examined. Using the external characters given by Belshaw (1993), specimens keyed with some difficulty to *C. lucorum*. However, a dissection of a male specimen revealed genitalia obviously different from those of *C. lucorum* illustrated in the key. Using the Central European key (Tschorsnig & Herting 1994), the specimens keyed to *C. laxifrons* without difficulty. Comparison with limited European material (5 specimens) held at the Natural History Museum in London confirmed their identity as *C. laxifrons*. Examination of just over 200 British specimens of *C. lucorum* in the collection of the BMNH revealed no further examples of *C. laxifrons*.

Identification

In the key provided by Belshaw (1993), an initial split between the various species of *Carcelia* is made on the basis of the colour of the basicosta, with the basicosta being described as either yellow or dark brown. In *C. laxifrons* this feature is unreliable, with the basicosta being variable in colour. In the specimens seen, the colour ranges from almost all yellow to almost completely brown.

With a yellow basicosta, specimens will run to the couplet separating *C. rasa* and *C. puberula*. Here, the key is further complicated by the recent addition to the British list

of *Carcelia bombylans* Robineau-Desvoidy (Collins *et al.* 2002). *C. laxifrons* can be distinguished from these three species on the basis of the wide frons and the presence of 2 or 3 antero-dorsal bristles on the tibia of the middle leg, all of the other species having only 1 antero-dorsal bristle. With a brown basicosta, without additional characters, specimens run to *C. lucorum*

With the addition of both *C. laxifrons* and *C. bombylans* to the British list, it became clear that a simple amendment of the key in Belshaw (1993) could not be constructed satisfactorily. When revising the key, it became apparent that additional valuable diagnostic features could be seen when examining the male genitalia. We therefore present a new key to the British species of *Carcelia*, based in part on that by Tschorsnig & Herting (1994), illustrating the male genitalia of all 8 British species of this genus.

Key to the British species of *Carcelia*

1. Basicosta entirely yellow AND middle tibia with 1 antero-dorsal bristle..... **2**
 - Basicosta dark-brown OR if paler, middle tibia with 2 - 3 antero-dorsal bristles .. **4**
2. Frons 0.53 - 0.61x as wide as an eye in males, 0.63 - 0.71x in females. Dusting yellowish-gray to golden yellow. Postpronotum (postpronotal lobe of Belshaw (1993)) completely or predominantly yellow (view from the side, under the dusting). In lateral view, male terminalia with common tooth on ventral surface of cerci (Fig. 2)..... ***Carcelia bombylans*** Robineau-Desvoidy
 - Frons in males and females either narrower or wider than the measurements given. Dusting gray to yellowish-gray. Postpronotum usually black. In lateral view, male terminalia without tooth on ventral surface of cerci (Figs. 4 & 6)..... **3**
3. Frons 0.42 - 0.50x as wide as an eye in males, 0.47 - 0.58x in females. Hairs of tergites 3 and 4 1/3 - 2/5 as long as the corresponding segment. In lateral view, male terminalia with tip of surstylus rounded (Fig. 4). In dorsal view, cercus broad, approximately 2.25x as long as width at widest part- (Fig. 3). ***Carcelia rasa*** (Macquart)
 - Frons 0.64 - 0.72x as wide as an eye in males, 0.72 - 0.87x in females. Hairs of tergites 3 and 4 3/5 - 2/3 as long as the corresponding segment, sometimes with irregular discal bristles. In lateral view, male terminalia with tip of surstylus pointed (Fig. 6). In dorsal view, cercus narrow, >3x as long as width at widest part (Fig. 5)..... ***Carcelia puberula*** Mesnil
4. Tergite 4 without discal bristles **5**
 - Tergite 4 with discal bristles **6**
5. Frons 0.60 - 0.72x as wide as an eye in males, 0.70 - 0.75x in females. Middle tibia with 1 antero-dorsal bristle. Arista starts to taper one-third of the way its length. Male terminalia Figs. 7 & 8. In lateral view surstylus rounded at tip and approximately equal in length to the cercus..... ***Carcelia atricosta*** Herting
 - Frons 0.55 - 0.65x as wide as an eye in males, 0.65 - 0.77x in females. Middle tibia with 2-3 (in rare cases only 1) antero-dorsal bristles. Arista starts to taper between two-fifths and half-way along its length. Male terminalia Figs. 9 & 10. In lateral view surstylus squared off at tip and approximately 0.75x the length of the cercus ***Carcelia gnava*** (Meigen)

6. Apical scutellar bristles much shorter and weaker than the lateral bristles, at most as long as the scutellum. The space between the subapical bristles 1.1 - 1.5x as great as the distance to the basals. Frons 0.6 - 0.7x as wide as an eye in males, 0.6 - 0.8x in females. Middle tibia in males with only 1 antero-dorsal bristle, in females often with a second, weaker bristle above. In females, last fore tarsal segment widened, 2 - 3x as long as the penultimate segment. Male terminalia Figs. 11 & 12.....*Carcelia tibialis* (Robineau-Desvoidy)
- Apical scutellar bristles as long and as strong as the lateral bristles, longer than the scutellum. The space between the subapical bristles 1.6 - 1.9x as great as the distance to the basals. Middle tibia with 2 - 3 antero-dorsal bristles. Females: last fore tarsal segment not widened, 1 - 1.5x as long as the penultimate segment 7
7. Middle and hind tibia completely yellow. Frons 0.8 - 0.9x as wide as an eye in males, 0.86 - 1.0x in females. Space between the posterior ocelli almost as great as the distance between the anterior acrostichals. Facial ridges with thin bristles reaching 1/2 the distance from the vibrissae to the base of antennae. Basicosta variable in colour, can be dark brown but may become paler at distal end. Male terminalia Figs. 13 & 14, in lateral view cerci without a projecting tooth on the ventral surface; surstyli about as long as cerci.....*Carcelia laxifrons* Villeneuve
- Ventral surface of middle tibia (and usually hind tibia) darkened at the base. Frons 0.50 - 0.65x as wide as an eye in males, 0.63 - 0.79x in females. Distance between the posterior ocelli much less than the distance between the anterior acrostichals. Facial ridges with bristles in only the lower 1/4. Basicosta black brown. Male terminalia Figs. 15 & 16, in lateral view cerci with a projecting common tooth on the ventral surface, this tooth is also visible in dorsal view; surstyli distinctly shorter than cerci.*Carcelia lucorum* (Meigen)

Material Examined

England: 5 males, 5 females, Dungeness, Kent. Ex. Pupae of *Euproctis chrysorrhoea*, coll. 2.vii.1983, emerged iv.1984.

Discussion

With the recognition of *Carcelia laxifrons*, a total of 8 species of *Carcelia* have now been recorded from Britain. To date, these specimens from Dungeness would appear to be the only British examples of this species. Although widespread across southern England, the host larvae possess urticating hairs and the species is very rarely reared by enthusiasts, possibly leading to the under-recording of this species.

Acknowledgements

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References

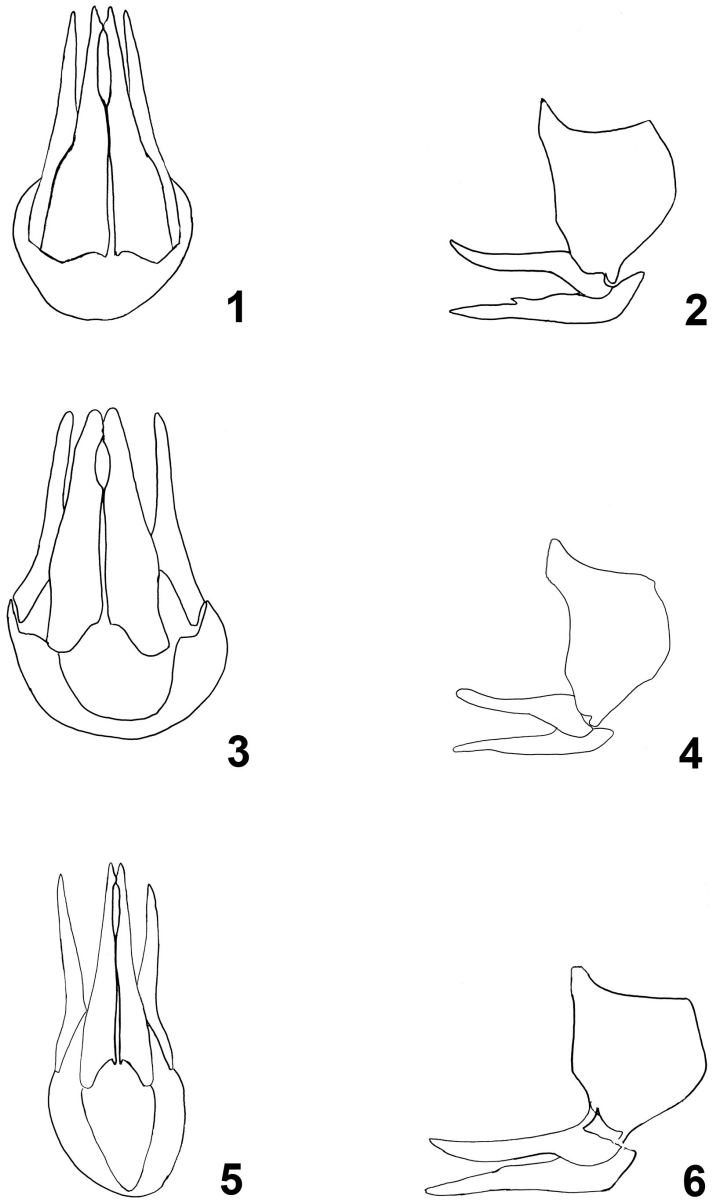
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Figure Captions

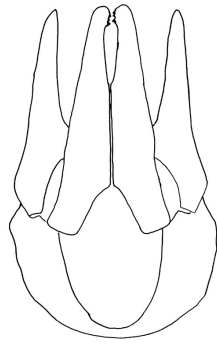
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Figs. 7-12. Male terminalia: *Carcelia atricosta* : 7, caudal view; 8, lateral view. *Carcelia gnava*: 9, caudal view; 10, lateral view. *Carcelia tibialis*: 11, caudal view; 12, lateral view.

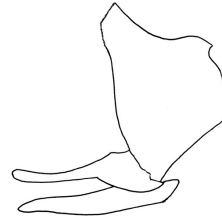
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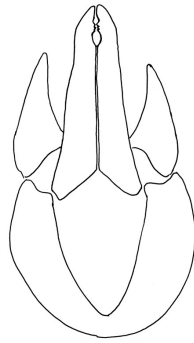
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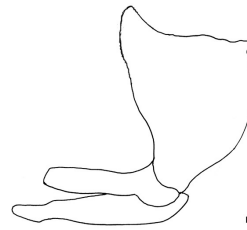
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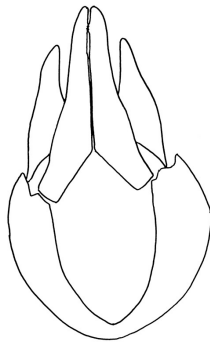
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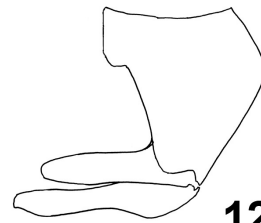
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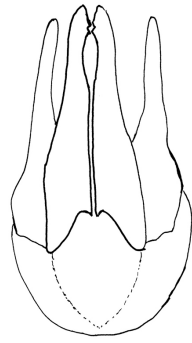


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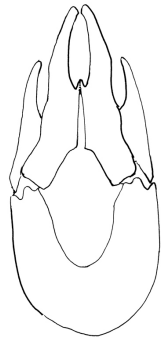
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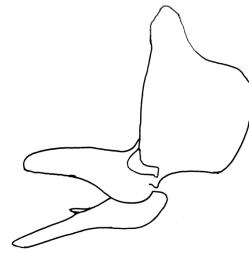
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Figs 13-16. Male terminalia: *Carcelia laxifrons*: 13, caudal view; 14, lateral view.
Carcelia lucorum: 15, caudal view; lateral view; 16, lateral view.