

CASE REPORT: RECOVERY OF *CALLIPHORA VICINA* FIRST-INSTAR LARVAE FROM A HUMAN TRAUMATIC WOUND ASSOCIATED WITH A PROGRESSIVE NECROTIZING BACTERIAL INFECTION

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Abstract. Human myiasis caused by *Calliphora vicina* is rare in Europe. Here we report a case of *C. vicina* infection occurring in the traumatic leg wound of a healthy 21-year-old man. Firstly, a progressive necrotizing infection developed in the wound despite administration of antibiotics. *Aeromonas hydrophila* was isolated from the wound samples. Secondly, during debridement, *C. vicina* first-instar larvae were isolated from the wound. To our knowledge, this is the first European case of *C. vicina* wound myiasis associated with severe *A. hydrophila* infection.

Human myiasis is due to parasitic infestation of human body by larvae of the fly Brachycere Diptera, commonly known as maggots. In Europe, *Calliphora vicina* Robineau-Desvoidy (Diptera: Calliphoridae) is a very common urban species of fly closely associated with man.¹ Usually larvae develop on carrion and their finding in humans in non-tropical countries is a rarity.¹ Human myiasis caused by *C. vicina* have been reported on only a few occasions.^{2–4}

CASE REPORT

The case was a healthy young man, living in the small town of Feignes, north of France. On June 7, 1999, he had a 5 meter-fall which caused a bifocal open fracture of the left shinbone with a significant muscular contusion without vascular lesion and with a multiple fracture of the left metatarsus.

The combined fractures of the tibia and fibula were treated with an external fixator. The first metatarsus fixation was accomplished with screws and bone plates. The patient was managed by daily clean dressing and antibiotherapy for possible bacterial infection (netilmicine: Netromycine® 900 mg, ornidazole: Tiberall® 1 g, amoxicilline + clavulanic acide: Augmentin® 3 g, per day). Thrombosis was prevented by dalteparine sodique: Fragmine® 7500, twice a day. Hemocultures showed no growth, but *Aeromonas hydrophila* was isolated from the wound samples on June 10. A necrosis injury appeared a few days later and was removed on June 16. Anemia (Hb = 7 g/dl) was treated by transfusion.

On June 18, 11 days later, a complete necrosis of the antero-external muscular part of the left leg appeared. During the surgical treatment (vigorous debridement), maggots were found and *Aeromonas hydrophila* was again isolated from the wound. Once the larvae were removed, oxygenotherapy (2.5 ATA/100% O₂, 19 times of 90 min each) and new antibiotherapy (piperacilline + tazobactam: Tazocilline® 12 g and amikacine: Amiklin® 1 g, per day) were instituted to prevent amputation. Blood tests showed a white blood cell count of 17,000 leucocytes/mm³ with 84% segmented cells. No further complications were noted. However on June 28, 3 weeks after the injury, a below-knee amputation was performed.

The larvae were identified as first-instar larvae of *Calliphora* spp. Grown in the laboratory at room temperature, within 72 hours they were identified as third-instar larvae of *Calliphora vicina*. They presented an anterior spiracle with 8 branches and posterior spiracles with 3 slits each (Figure 1).⁴ The cephaloskeleton presented an accessory oral sclerite (Figure 2).⁴

DISCUSSION

A *Calliphora vicina* female can lay up to 300 eggs, either in small groups or as a single batch, in carrion or in wounds.^{1,4} First-instar larvae hatch within one day's time or less. Under warm and otherwise favorable conditions the larvae feed for 3–4 days. The puparium is formed approximately 2–3 days later and lasts at least one week. The time it takes to develop into an adult insect depends on temperature; at 27°C it takes about 18 days.¹

Adult Calliphoridae females lay eggs on fresh cadavers immediately after death under favorable conditions.¹ Therefore, Calliphoridae species are often used as forensic indicators of the post-mortem interval.⁵ In cases of advanced decomposition, when no tissues or body fluids are available, *C. vicina* and other Calliphoridae can serve as alternate specimens for toxicological analysis.^{6–8}

Also, *C. vicina* larvae are known agents of traumatic myiasis in man and animals.⁴ In Europe this diptera plays a minor role in secondary sheep myiasis.⁴ The cases of *C. vicina* human infestation that Zumpt⁴ reviewed were cases of intestinal and urinary myiasis. More recently, a urethral and vesicular myiasis by *C. vicina*³ and a case of mixed cutaneous myiasis by *C. vicina* and *Lucilia sericata* (Diptera: Calliphoridae)² have been reported.

In the present case, the circumstances of the infestation are open to speculation. Climatic factors such as temperature and humidity are known to influence egg-laying and development of instar-larvae.⁹ The weather was warm when the current case occurred. All *Calliphora* species develop in decomposing organic matter, which explains the trend towards an occasional facultative parasitism, especially during the warm season.⁴ This is consistent with the cases recently reported.^{2,3} Contrary to patients with human myiasis caused by

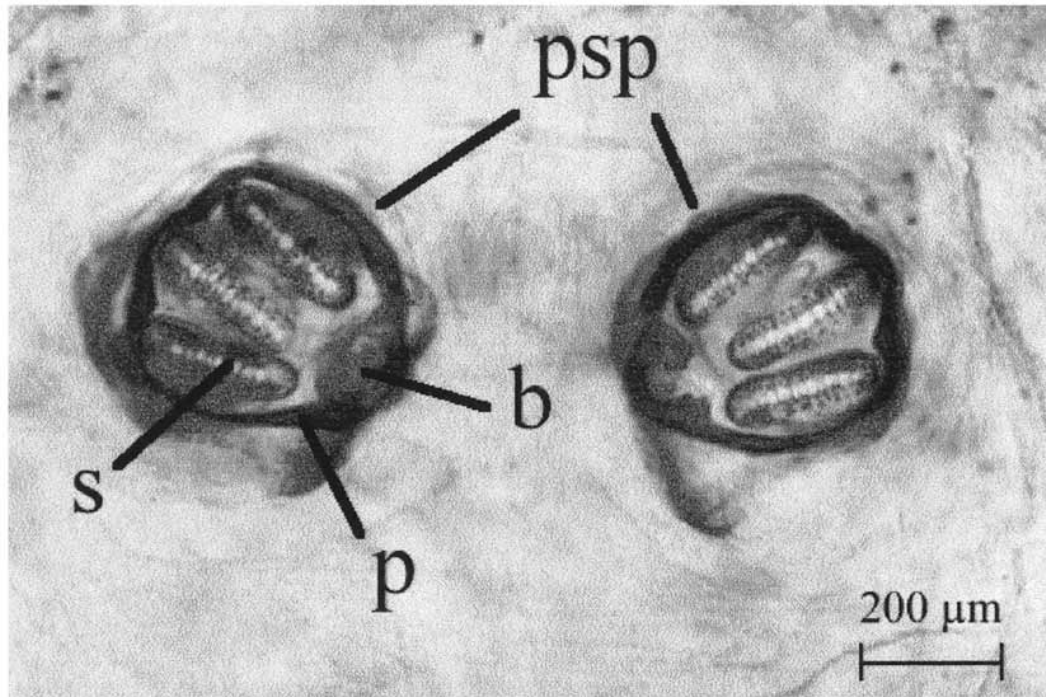


FIGURE 1. Posterior spiracles (psp) of a third stage larva of *Calliphora vicina* sampled in the myiasis. b = button; p = peritreme; s = slit.

C. vicina in Britain, who were probably both elderly and unwell at the time of infection, our patient was a healthy man in good general condition.⁹ However, predisposing factors such as a wound seem to play a special part, especially when necrosis injury is associated.^{2,3} Both aerobic bacteria and anaerobes such as *A. hydrophila* have been associated with traumatic wounds.¹⁰ *Aeromonas hydrophila* infection can be rapidly progressive with extensive necrosis and with gas formation.¹¹⁻¹³ In the present case, we can assume that myiasis was favoured by bacterial necrosis injury, as *C. vicina* larvae are necrophagous.

Recently reported *C. vicina* myiasis cases^{2,3} show that myiasis is not exclusive to tropical lands, but occurs also in temperate European countries. Myiasis can occur especially during the warm season when there are a lot of flies. In most cases there are predisposing factors such as a wound or traumatic lesions. Therefore, myiasis should be considered as a potential etiology of wound infection complications.

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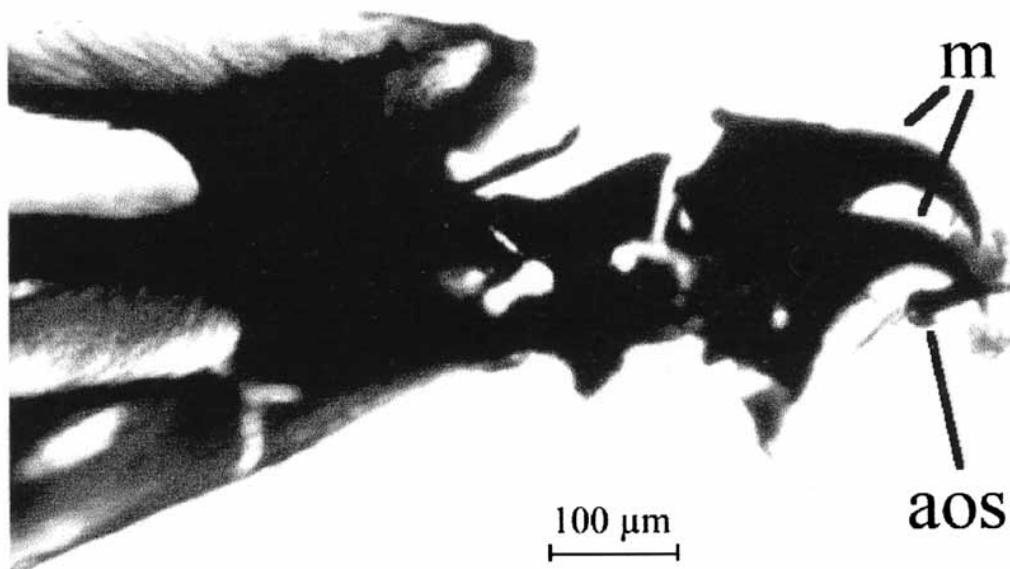


FIGURE 2. Mouthparts of a third-stage larva sampled in myiasis. The accessory oral sclerite (aos) situated between the two mandibles (m) is characteristic of *Calliphora* species.

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