A New Zealand case of nasal myiasis involving *Lucilia cuprina* (Diptera: Calliphoridae)
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ABSTRACT
A case of nasal myiasis that occurred in February 2017 in the Northland region was the first involving *L. cuprina* naturally-acquired in New Zealand.

The order Diptera (two-winged flies) contains many species that afflict humans and their endeavours, but arguably the larvae (maggots) of those that cause myiasis (invasion of living animals by larvae) excite the most disgust.

A review of instances of human myiasis in New Zealand divided them into imported and indigenously-acquired cases. Eyes, nasal passages and wounds were the predominant sites from which the larvae were isolated. In two cases blowflies (Calliphoridae) were involved. The European green blowfly (*Lucilia sericata*) was found in a mastoid cavity (Waikato Hospital (2009)). In the second, the Australian sheep blowfly (*L. cuprina*) was found in an infested wound. This patient had arrived from Fiji.

Case report
A 67-year-old New Zealand-born European male from the rural Kaiwaka area, (approximately 60km south of Whangarei) diagnosed with squamous cell carcinoma of his nose presented at the Whangarei Base Hospital Ear, Nose and Throat services in February 2017 with nasal irritation and foreign body sensation in his nasal wound and eye for one week.

The patient was described as fit and well and had lived at Kaiwaka since 2011 where living conditions were described as basic but clean.

The patient's history indicated a keratinised lesion on the right nasal alar evident in photos taken 14 years previously. This gradually increased in size eroding local tissues. Clinical and histological diagnosis of squamous cell carcinoma was confirmed in approximately 2005. Gold standard therapy for squamous cell carcinoma is surgical excision which was declined by the patient and alternative therapies pursued. The lesion gradually encompassed and eroded his entire nose and after 10 years involved the majority of his face with exposed nasal cavity and multiple sinuses. Once the wound reached the stage where it was an open lesion the patient chose to leave it undressed. Information provided by family indicated that the patient had been forewarned of the possibility of flies depositing eggs or larvae in the open wound while sleeping. The patient preferred not to use a mosquito net which could have provided some protection.

On examination, a 12x10cm necrotic, erosive, fungating wound involved the entire nose, left cheek, medial eye and forehead. Multiple larvae were seen in the wound. The patient was afebrile and had normal vision. There was no evidence of active cellulitis in surrounding tissue. Computed topographic scanning confirmed a breach of the bony orbit, medial and anterior aspects of the maxillary sinus and posterior aspect of the frontal sinus.
suggesting near dural involvement. Infectious disease services advised intravenous amoxicillin/clavulanic acid and manual extraction was recommended. Ketamine sedation was administered and approximately 60 larvae were removed. Paraffin ointment was applied to the wound bed to encourage a hypoxic growth medium for the larvae, thus encouraging removal from crevices. One serial debridement and extraction was performed 48 hours later and the patient discharged the following week after adequate nursing care was established at home along with palliative care involvement. The patient declined any consideration of curative surgery or radiotherapy.

Two larvae, removed from the wound and preserved, were identified independently by DB and AH, and agreed on consultation, as third instar larvae of *L. cuprina* using external morphological characters, specifically the form and arrangement of the spines on the spine band between the head and first thoracic segment. This readily differentiates *L. cuprina* from *L. sericata*. Specimens of the latter were available for comparison. *Lucilia cuprina* (Figure 1) is a recent addition to the New Zealand fauna, not known prior to 1985 but confirmed from flystruck goats in Northland in 1988. A subsequent survey showed the species had in fact been in New Zealand from around 1984. It now occurs throughout the country and is the predominant species identified in flystrike cases in sheep.

**Discussion**

This is the first New Zealand report of a naturally-occurring human myiasis infestation involving *L. cuprina*. Cases of human myiasis involving *L. cuprina* were reported from Brisbane, Australia (10/14 hospital cases) and it was also present in 1/42 cases in the US. An Oklahoman case of human nasal myiasis involving *L. cuprina* was acquired following admission to hospital but more commonly wounds have become infested prior to presentation for treatment.

Sterile blowfly larvae used as a maggot debridement therapy (MDT) are typically *L. sericata* a species that feeds readily on dead tissue whereas *L. cuprina* larvae generally (but not exclusively) prefer live tissue.

![Figure 1: Lucilia cuprina adult.](image_url)
Unintentional MDT use of a colony of *L. cuprina* in Egypt, resulted in two applications of these larvae to patients with diabetic foot ulcers. The wounds healed successfully. This colony was assumed to be *L. sericata*, but had been established from a contaminated source. This latter case supports the view that with careful management *L. cuprina* may have a role in MDT.

In the cases reviewed here the resident populations of larvae were removed and the wounds variously treated or further debrided. In the present case, it was noted that some opportunistic larvae were feeding on the necrotic tissue, but their removal was indicated given that they had access to open interior cavities which was not in the patient’s best interests.

**Competing interests:**
Nil.

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