

Variations in numbers of occipital setae for two species of *Lucilia* (Diptera: Calliphoridae) in New Zealand

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ABSTRACT

The characteristics of leg colour and occipital setal counts are used to distinguish between the 2 species of *Lucilia* blowflies that occur in New Zealand. Variations from the published counts for the occipital setae for *L. sericata* and *L. cuprina* have been recorded in material received from a New Zealand flystrike survey.

Keywords: Diptera, Calliphoridae, blowflies, *Lucilia sericata*, *Lucilia cuprina*, occipital setae, identification, New Zealand.

INTRODUCTION

Until 1988, the blowfly *Lucilia sericata* (Meigen) (Calliphoridae) was the only species representative of this genus recorded in New Zealand. However, in early 1988 a second

species was recognised, *L. cuprina* (Wiedemann) (R. Kleinpaste pers. comm.). Using data obtained from MAF Technology Wallaceville flystrike survey the distribution of both species has been defined as *L. sericata* being widespread throughout New Zealand, and *L. cuprina* being at present limited to the North Island of New Zealand and to the northern regions (as far south as Sefton; 43° 15' S 172° 40' E) of the South Island. This southern limit is expected to extend in future fly activity periods.

Separation of the adults of these 2 *Lucilia* species relies principally on microscopic examination of 2 main and 3 lesser recognisable characteristics. In *L. sericata* the femoral joint of the first pair of legs is blue/black with a metallic sheen where as in *L. cuprina* the joint is metallic green (Dear 1986; Waterhouse & Paramonov 1950; Zumpt 1965).

A second reliable characteristic is the number of occipital setae (Zumpt 1965, p. 47; Figs 1 & 2 of Waterhouse & Paramonov 1950, p. 315) located at 2 sites, laterally on the back of the head (Fig. 1 this paper). Waterhouse & Paramonov (1950) in their key record *L. cuprina* as having 1 occipital seta on each side, with 6 to 8 on each side for *L. sericata*. Dear (1986) records the same range of counts. Zumpt (1965) notes a 1/1 count for *L. cuprina*, but 3 to 8 occipital setae for *L. sericata*.

In the course of a New Zealand survey on flystrike (Heath & Bishop in prep.) 648 specimens of *Lucilia* have been examined. On occasions great reliance was placed on occipital setal counts when the first pair of legs were missing. Variations from the published counts were noted, and these are presented here for both sexes of *L. cuprina* and *L. sericata*.

METHODS

MAF Technology Wallaceville has been conducting a flystrike survey for 7 years (Heath & Bishop in prep.). Samples of fly larvae from farm stock with patent myiasis are submitted to this laboratory for rearing and identification. From the time that *L. cuprina* was recognised as occurring in New Zealand records were kept of the occipital setae counts for both sexes of both species of *Lucilia*. Only those flies with intact setae were used or with heads tilted forward, allowing an unobstructed view of the back of the head so that setal pores could be counted in the case of missing setae. Flies were examined intact in case any confusion arose with the occipital setal counts and other characteristics needed to be examined.

RESULTS

Variations in occipital setae counts are presented as 2 sets of data. In Table 1 the data for left side and right side counts is presented for *L. sericata* and *L. cuprina* individually, but with both sexes combined. In Table 2 the sexes are differentiated for both species.

There was no significant difference between the counts recorded for the individual sexes of either species of fly.

It was also noted that the setal counts were not always equal on both sides of the head. For example, *L. cuprina* could have a count of 2 on the left side of the head and only 1 on the right side and similarly with *L. sericata*—left side 3 and right side 5 (Fig. 1). Therefore it was also possible that any combination of the ranges given in the above tables could occur. Bilateral variation in setal counts for *L. sericata* was also recorded by Waterhouse & Paramonov (1950).

Table 1: Occipital setal counts for both species of *Lucilia*, sexes not differentiated.

| Species | Range of counts | Average | Standard deviation | Sample size |
|--------------------|-----------------|---------|--------------------|-------------|
| Left side: | | | | |
| <i>L. sericata</i> | 1-8 | 4.28 | 1.60 | 241 |
| <i>L. cuprina</i> | 0-2 | 1.06 | 0.28 | 407 |
| Right side: | | | | |
| <i>L. sericata</i> | 1-11 | 4.30 | 1.64 | 241 |
| <i>L. cuprina</i> | 0-3 | 1.05 | 0.25 | 407 |

DISCUSSION

Published accounts of occipital setal counts suggest that there is no overlap in the numbers of setae in either of the *Lucilia* species (Dear 1986; Waterhouse & Paramonov 1950; Zumpt 1965). But it can be seen from the examination of 241 *L. sericata* and 407 *L. cuprina* in the present study that overlapping counts occur. Taking the range of counts (0-3) observed for *L. cuprina*, there were 55 *L. sericata* (22.8%) that, had they not had their first pair of legs intact, could have been misidentified. In this case, where the occipital setae counts could belong to either species and the first pair of legs is missing, use is made of less obvious characteristics, setal arrangement on the humeral callus (Greenberg 1971; Waterhouse & Paramonov 1950) or relative length of presutural acrostichal setae to postsutural acrostichal setae (Waterhouse & Paramonov 1950).

It is important that the distinction is made between the 2 *Lucilia* species especially for recording changes in the geographic distribution of *L. cuprina* in the South Island. In Australia, this fly is responsible for 90% of the cases of flystrike recorded (G. Levot pers. comm.). Present New Zealand flystrike survey results indicate that this species is becoming the predominant one (Bishop, Heath & Cole 1991) and could emulate the situation seen in Australia, indicating more severe flystrike seasons. With the gradual climatic warming (Salinger & Hicks 1989) being experienced in New Zealand, a longer fly activity season is also predicted with flies moving into and establishing in previously non-favourable or marginal fly areas (Heath 1990).

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