



Identifying flies used for maggot debridement therapy

K A Williams, F J Cronje, L Avenant, M H Villet

To the Editor: The use of maggots to clean necrotic wounds, known as maggot debridement therapy (MDT), has long been known to the scientific world. Its use has been recorded since the 1500s when soldiers' wounds were often infested with maggots. Napoleon's surgeon, Baron Dominic Larrey, reported that wounds that were infested with maggots appeared to heal faster than those without maggots.¹ William Baer is considered to be the founder of modern MDT. While treating soldiers in World War I, he noted the good condition of wounds that had been infested with maggots, and was the first doctor on record to experiment with the use of maggots in treating infections.¹ MDT even featured in the recent version of the film 'Spartacus'.

Various species of flies have been used for MDT,¹ the most commonly used being *Lucilia sericata*, a greenbottle blowfly (Figs 1 and 2). This fly is closely related to another greenbottle, *L. cuprina*, but *L. cuprina* feeds on live as well as necrotic tissue, which is undesirable in MDT. *L. cuprina* is commonly named the 'sheep blowfly' because it is responsible for fly-strike in sheep, a form of massive, usually rectal myiasis that can kill sheep.

A recent article² suggested that *L. cuprina* was being used successfully for MDT at the Eugene Marais Hospital Wound Care Centre (EMHWCC). As this would be inconsistent with international experience in MDT and at odds with the usual biology of *L. cuprina*, it was decided to check the identity of these flies.

Materials, methods and results

Flies were sampled from two different colonies of *Lucilia* held at the EMHWCC. DNA was extracted and polymerase chain reaction (PCR) amplification was performed. PCR products were sequenced for the respective genes using the primers used for their amplification.³

A total of 654 base pairs were sequenced for the 28S gene and a total of 601 base pairs were sequenced for the COI gene. The nuclear sequences (28S) of the MDT flies formed a distinct

Entomology Department, Durban Natural Science Museum, Durban
K A Williams, MSc

Department of Interdisciplinary Health Sciences, Division of Community Health,
Stellenbosch University

F J Cronje, MB ChB, MSc
L Avenant, Student

Southern African Forensic Entomology Research Laboratory, Department of Zoology
and Entomology, Rhodes University, Grahamstown, E Cape
M H Villet, PhD, PGDHE

Corresponding author: K A Williams (williamsk@durban.gov.za)

March 2008, Vol. 98, No. 3 SAMJ



Fig. 1. Sterile larvae in biobag.



Fig. 2. *Lucilia cuprina*.

group with the *L. sericata* sequences obtained from Genbank, with a bootstrap support value of 66% and a neighbourhood joining value of 98%, while *L. cuprina* sequences from Genbank formed a separate cluster with a bootstrap support value of 67% and a neighbourhood joining value of 99%. Similarly, the COI sequences separated into two distinct branches with respective bootstrap support values and neighbourhood joining values of 74% and 53% and 72% and 71%, respectively. Bootstrap values about 80% are considered to indicate very reliable groups. The *L. sericata* group included all of the EMHWCC MDT flies.

Discussion

L. sericata and *L. cuprina* are similar in morphology and it is extremely difficult to correctly identify them using the literature as many characters in these works are subtle and subjective, e.g. colour being bright green or metallic green.⁴⁻⁶ This also makes it difficult for non-entomologists to identify these flies correctly.



Our study shows that the flies from the EMHWCC MDT colony are in fact *L. sericata* and not *L. cuprina*. This is what would be expected, as *L. sericata* is widely used in Europe and the USA for MDT.¹

The issue of correct identification of these blowflies becomes a medical issue when they are used for MDT, and it is advisable to have adequate quality assurance criteria and protocols in place. The most reliable protocol is to sequence the DNA of these flies for a diagnostic gene.

This study highlights the need for quality assurance protocols for identifying flies for MDT. It demonstrates that the nuclear 28S rRNA gene would be a good choice for this task,

and suggests that qualified entomologists who specialise in DNA sequencing of flies assist in this matter.

References

1. Sherman RA, Hall MJR, Thomas S. Medicinal maggots: an ancient remedy for some contemporary afflictions. *Annu Rev Entomol* 2000; 45: 55-81.
2. Cronje FJ, Avenant L. MDT in South Africa today. *Palmnut Post* 2006; 9(2): 8-10.
3. Harvey ML, Gaudieri S, Villet MH, Dadour IR. A global study of forensically significant calliphorids: implications for identification. *Forensic Sci Int* (in press): doi:10.1016/j.forsciint.2007.10.009
4. Holloway BA. Morphological characters to identify adult *Lucilia sericata* (Meigen, 1826) and *L. cuprina* (Wiedemann, 1830) (Diptera: Calliphoridae). *New Zealand Journal of Zoology* 1991; 18: 415-420.
5. Wallman JF. A key to the adults of species of blowflies in southern Australia known or suspected to breed in carrion. *Med Vet Entomol* 2001; 15: 433-437.
6. Aubertin D. Revision of the genus *Lucilia* R.-D. (Diptera, Calliphoridae). *Linn Soc J Zool* 1933; 38: 389-463.

Regional clinical registry data show increased incidence of cutaneous melanoma in Cape Town

S Jessop, H Stubbings, R Sayed, J Duncan-Smith, J W Schneider, H F Jordaan

To the Editor: Cutaneous melanoma is a skin tumour that continues to result in a high mortality rate, particularly in the case of thick tumours and those that are deeply invasive histologically. It occurs in all populations but is most common in fair-skinned individuals, especially those with skin types 1 and 2 that tan poorly or not at all. There is epidemiological evidence for the pathogenetic role of ultraviolet light, particularly intense childhood exposure, although the relationship is complex.^{1,2} Genetic factors also play a role, as exemplified by families with both atypical naevi and melanoma.³

Division of Dermatology, Department of Medicine, University of Cape Town and Groote Schuur Hospital

S Jessop, MB ChB, FFDerm (SA)

Division of Radiation Oncology, Department of Radiation Medicine, University of Cape Town

H Stubbings, MB ChB, FFRad (T) (SA) (currently at Department of Oncology, Norfolk and Norwich University Hospital, Norwich, UK)

J Duncan-Smith, BOccupTher

School of Public Health and Family Medicine, University of Cape Town

R Sayed, MSc (Stats)

Department of Anatomical Pathology, Stellenbosch University and National Health Laboratory Services, Tygerberg Hospital, Parow, W Cape

J W Schneider, MB ChB, MMed (Anat Path), FCPATH (SA)

Department of Dermatology, Stellenbosch University and Tygerberg Hospital, Parow, W Cape

H F Jordaan, MB ChB, MMed (Derm)

Corresponding author: S Jessop (Susan.Jessop@uct.ac.za)

The rising incidence of melanoma, noted initially in countries with high levels of UV light, appears to be levelling off or decreasing in some areas.⁴ The pattern of these trends is inconsistent, with even European countries showing great variation.

An epidemiological study performed in Cape Town from 1990 to 1995 demonstrated an incidence of melanoma of 24.4 per 100 000 white people per annum.⁵ We conducted a methodologically identical study in the same geographical area after a 10-year interval, to identify whether there is a trend in the incidence of melanoma in this area.

Methods

A prospective case-based study was conducted from 1 January 2001 to 31 December 2003. All histopathology reports of melanoma were obtained from all pathologists (private and public sector) serving the greater Cape Town area (as in the previous study).⁵

As the incidence of melanoma is low in dark-skinned individuals, the previous study was confined to white people. To obtain comparable data, the study population was defined in the same way in this study. Population figures for greater Cape Town (the study area as defined in the previous study) were based on the projected 2001 population, which estimated a denominator population of 441 970 whites above the age of 14 years.⁶

Histopathology reports were reviewed for patients' geographical area, gender, age, ethnic group, tumour site, Clark