

# Further Data on Wound Healing Rates After Application of *Lucilia sericata*

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The International Journal of Lower Extremity Wounds  
1–8

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DOI: 10.1177/1534734619876840

journals.sagepub.com/home/ijl



## Abstract

Maggot therapy has recently received a special medical and public attention, and according to the specialists' opinion, it takes us to the future of a wound care. Simultaneously, as new biomechanisms were discovered, statistical analyses of wound healing rates were conducted usually adopting simple parametric and nonparametric tests. In this study, based on a set of statistical methods, we performed an advanced analysis of wound surface reduction using *Lucilia sericata* larvae in different clinical aspects: status of diabetes mellitus, maggots' density, and pain intensity. Particularly, we employed these factors because, in our statistical analysis, they are easy to obtain and they proved to be the possible risk factors of wound regeneration. Furthermore, these factors represent different clinical, biological, and neurological spectra of knowledge. In our study, we have found further and statistically significant correlations between the analyzed variables and skin regeneration together with different time periods of the healing rate using maggot therapy in patients with lower limb ulceration.

## Keywords

maggot therapy, wound healing, diabetes mellitus, pain intensity

## Introduction

Maggots of *Lucilia sericata* species have recently received a great deal of attention in medicine, veterinary science, and forensic science.<sup>1</sup> This technique, applied for antiseptic removal of necrotic tissue, known today as maggot debridement therapy (MDT), was well established in various ancient regions, for example, aboriginal Australian, Asian, and American. Nevertheless, the intentional implementation of larvae is a relatively recent innovation in Western medicine.<sup>2</sup>

In the scientific literature the geographical distribution of the *Lucilia* species was reported, in which the authors highlighted that the knowledge about their distribution in South Africa would allow for a more effective management and utilization of these flies.<sup>3</sup> Wound healing with the larvae can become of critical importance in disaster medicine when the number of patients requiring treatment can be overwhelming and resources to assist the injured may be limited (eg, in low-income countries).<sup>4</sup>

Maggot debridement therapy has now come to the fore because it supports wound healing by 3 major clinical actions: mechanical debridement, infection combat, and cellular growth stimulation. Several authors have reported on these 3 mechanisms.<sup>1</sup> What is astounding is a recent discovery of inducible expression and production of human platelet-derived growth factor from 2 conditional expression systems in transgenic *L sericata* larvae<sup>5</sup> as well

as a Jonah-like chymotrypsin from the maggot excretion products that plays a role in wound debridement and coagulation.<sup>6</sup>

The range of application of MDT is becoming wider, and biological properties of *L sericata* are increasingly explored. For example, MDT of a fungating leg wound from Kaposi's sarcoma has also been introduced in wound care recently.<sup>7</sup> Antifungal properties of maggot excretion products are already confirmed in the subject literature.<sup>8</sup>

## Rationale

Statistical analyses on MDT usually comprised healing rates in comparison to traditional treatment methods<sup>9–11</sup> using standard parametric (eg, Student's *t*)<sup>12</sup> and nonparametric (eg, log-rank)<sup>13</sup> tests. In this light, we think that such comparative evaluations have been already and reliably reported and reviewed in many synthesized studies.<sup>14–17</sup> So as not to follow this research path again, in this article, we do not take a control group into account, and intentionally,

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