



3D models of a third instar larva and an adult of *Chrysomya megacephala* (Insecta, Diptera, Calliphoridae): a didactic, motivating and inclusive education view

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Abstract

An adult specimen and a third instar larva of *Chrysomya megacephala* were analyzed for a 3D model of each of the life forms presented by this Diptera (Insecta) of medical and forensic importance. This didactic strategy aims to motivate the public to learn taxonomy and entomology in general. In addition, it can be a viable alternative for inclusive education, particularly for those with some type of visual impairment, since it is possible to recognize the diagnostic characters by touch.

Key words:

Flies, teaching, forensic entomology.

Introduction

Chrysomya megacephala (Insecta, Diptera, Calliphoridae), popularly known as blowfly (= varejeira) or “mosca-do-churrasco”, is often found close to human habitations¹. Due to its necrophagous habit has great importance in the forensic area, since it is among the first insects to colonize a corpse². Data on its biology can be used, among others, to estimate the postmortem interval, to infer if there was a displacement of the body from the place where the death occurred or to associate suspects with the crime³. However, the use of information about its biology is only possible when the species is correctly identified¹.

The process of species identification can be laborious because many of the structures are tiny or very variable, there is a shortage of more detailed descriptions and the nomenclature is most often not standardized¹. In order to motivate the public to learn taxonomy and entomology in a more general context, in this study we elaborated 3D models for the adult and immature forms of a fly, *C. megacephala*, commonly found in the urban area.

Results and Discussion

The 3D models were constructed from the detailed observation of adult and immature specimens of *C. megacephala* preserved dry or in 70% alcohol. Photographs and information on diagnostic structures in literature^{4,5} were also used to establish the proportions of the structures to be incorporated into the model, resulting in 50.5 and 48 cm specimens of an adult (Fig. 1) and a larva (Fig. 2), respectively.

The materials used were polystyrene, foam, acrylic, glue, biscuit mass, cotton cord, plastic bristles and automotive paint.



Figure 2. Specimen of third instar larva (right) and 3D model (left) on an approximately 48x larger scale of *Chrysomya megacephala*.

Conclusions

The 3D models of arthropods can contribute to motivate the public (schoolchildren, graduates and other professionals) to learn the taxonomy, by making it more feasible to visualize small anatomical structures. It can also be an effective strategy for the dissemination of entomology. In addition, it can be a viable alternative for inclusive education, particularly for those with some type of visual impairment, since it is possible to recognize the diagnostic characters by touch.

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³ Catts, E. P. Problems in Estimating the Postmortem Interval in Death Investigations 1992.

⁴ Thyssen P. J. Esquema Morfologia Dípteros de Importância Forense, 2019

⁵ Carvalho de, C. J. B. & Ribeiro, P. B. Chave de Identificação das Espécies de Calliphoridae (Diptera) do Sul do Brasil, 2000.