

Rock a Botfly Baby: Botfly Larvae Survival in Humans vs. Non-humans

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Introduction

Botflies are parasitic flies part of the Oestridae family. There are approximately 150 species of botflies, but only one, the human botfly, *Dermatobia hominis*, preys on humans as their host. They are native to Central and South America, but there are cases where they have only been documented in North America due to travelers returning from trips to the equator.

Botfly mothers most commonly parasitize mammals by depositing their eggs into an open wound using its ovipositor. Such is the case for the species *Cuterebra* which tends to use smaller mammals as its host of choice. The human botfly, however, uses an intermediate vector to deliver its babies for it. *D. hominis* is one of the most genius insects when it comes to protecting its babies because it uses other insects, most commonly female mosquitoes, to carry its unborn babies to its host. The mother botfly catches a female mosquito in mid-air and attaches its eggs onto the mosquitoes body where they will eventually hatch from the body heat of a feeding mosquito. Within minutes the larvae will burrow themselves into the open wound on the skin of an animal where the mosquito was feeding. The larvae will continue feeding off of the subepidermal tissue of its host until they grow large enough to pupate. Once they are ready for pupation they crawl out of the host where they will drop to the ground and burrow themselves into the soil and eventually emerge as a botfly once again.

In this study I examined the number of botfly larvae found in human hosts compared to non-human hosts.

Methods

Data was collected by watching and analyzing 16 videos of botfly larvae extractions from humans and non-humans. Larvae were accounted for per individual. Histograms were developed from the data collected.



Figure 1: Reindeer Nose Botfly (*Cephenemyia trompe*)

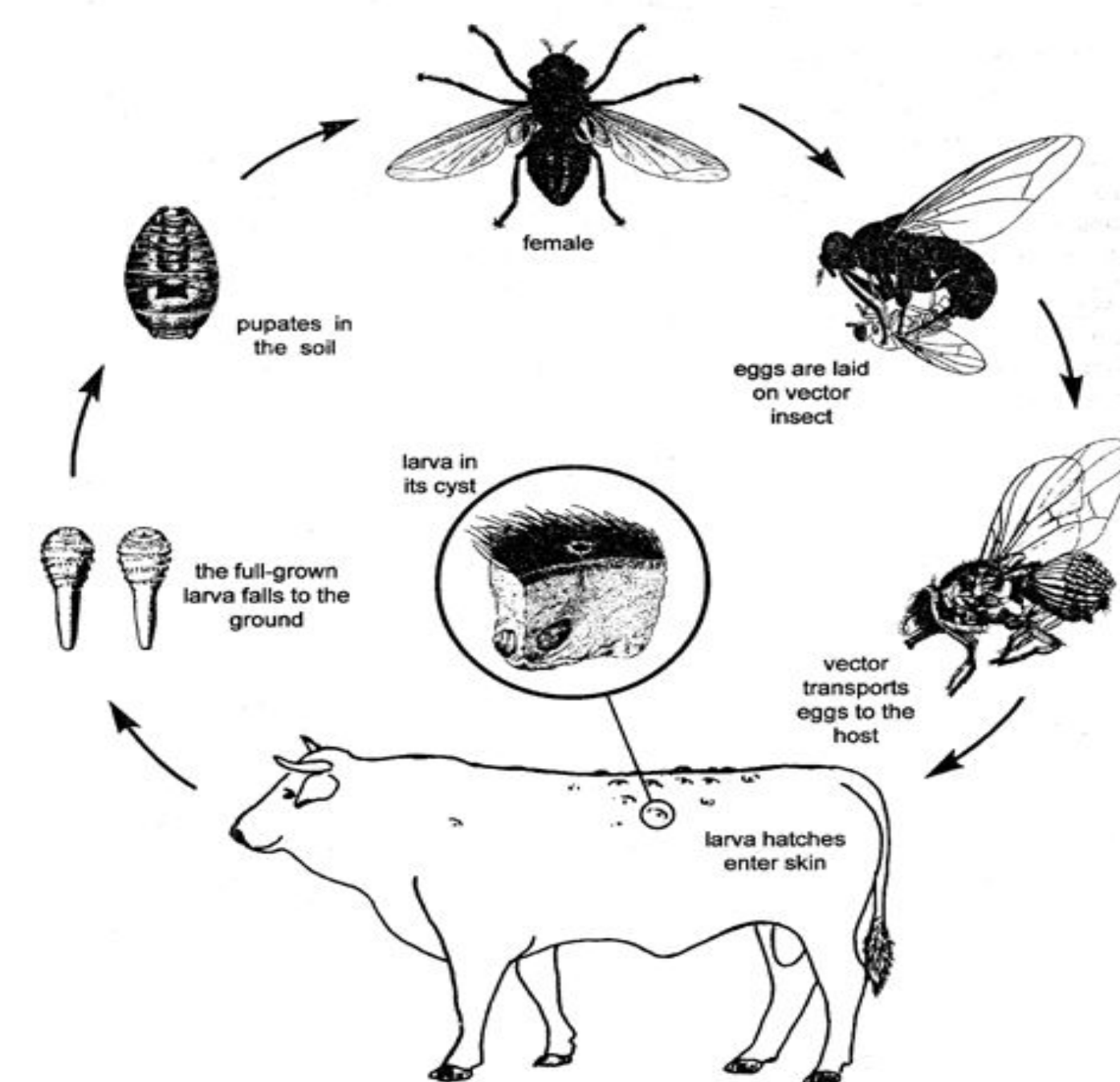


Figure 2: Botfly life cycle diagram

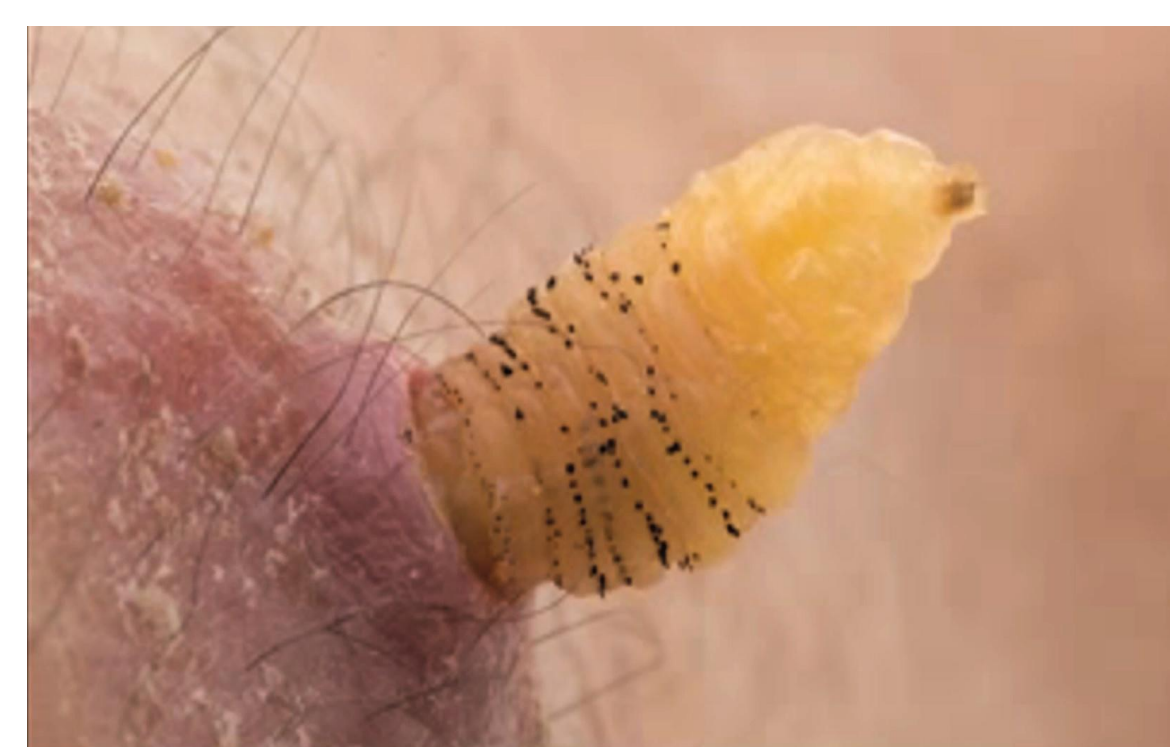


Figure 3: Engorged larvae emerging from human skin



Figure 4: Extracted larvae

Results

The number of botfly larvae extraction were observed from several humans and non-human mammals. The number of larvae extractions from individuals are accounted for in Table 1 and the average larvae extractions are reflected in Figure 5. The highest number of extractions was 10 larvae found in a non-human host. The highest number of extractions from a human was 5 larvae.

Video	Larvae in Humans	Larvae in Non-humans
1	5	5
2	3	1
3	1	1
4	1	2
5	1	1
6	1	1
7	4	8
8	3	10
\bar{x}	2	3.625

Table 1: Dataset of botfly larvae extractions per host

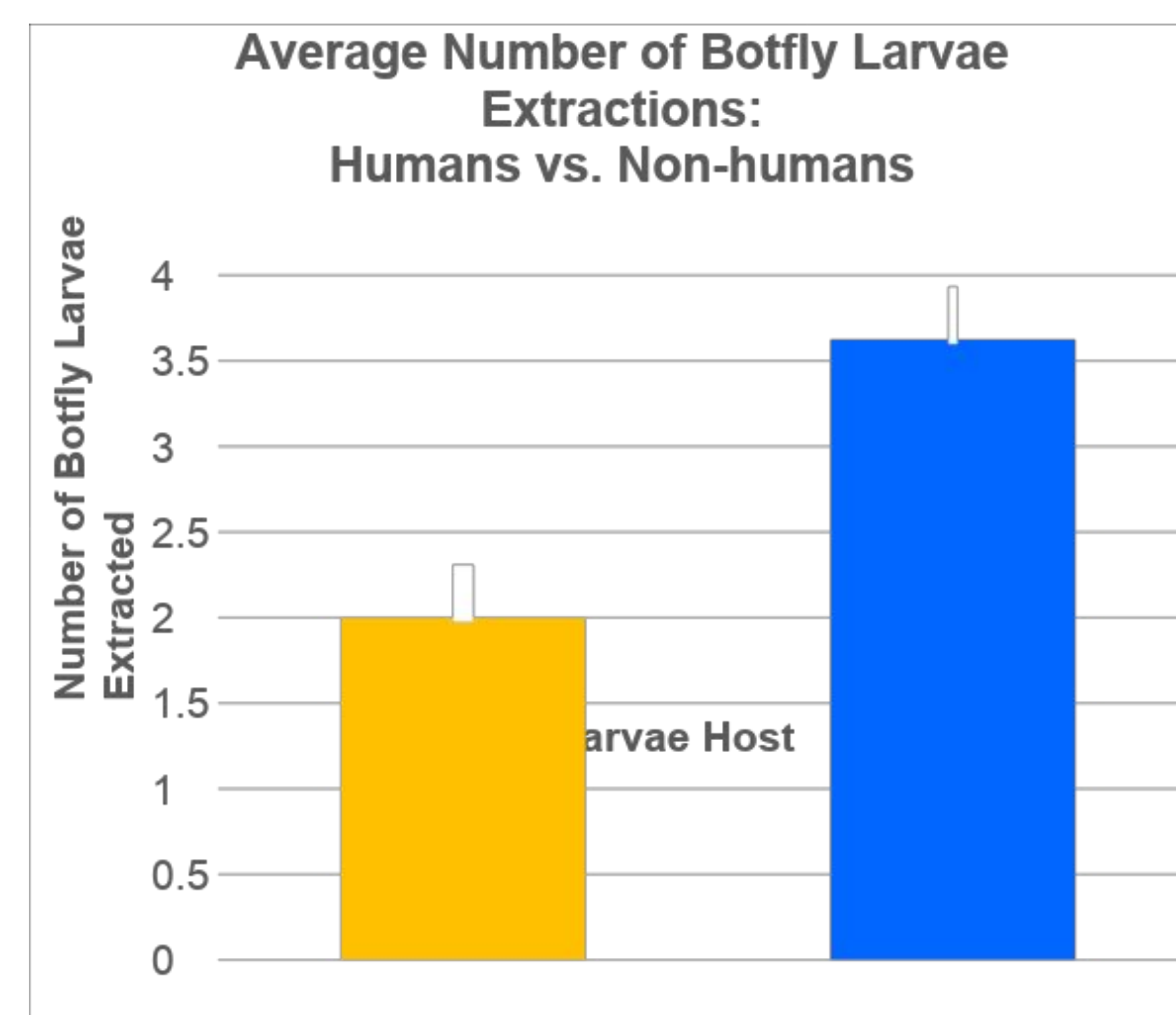


Figure 5: Histogram of number of larvae extracted from humans and non-humans

Conclusion

Based on the data that was collected, botfly mothers tend to lay more eggs inside of non-human mammals. The eggs that developed into larvae in the non-human mammals may have been from a species of botfly that uses its ovipositor to directly lay its eggs into a mammal host. The larvae that developed inside of humans may have been from *Dermatobia*. Botflies are conspicuous insects with robust bodies and large eyes with bodies spanning from 15 mm to 17 mm long. Humans are more able to protect themselves if encountering a large botfly in the wild compared to a small helpless squirrel or kitten. It is for this reason that a botfly may have evolved its clever behavior of trapping an intermediate vector to deliver its babies for it such as a mosquito or a tick. In conclusion, a female botfly may be able to have more surviving offspring if they are able to deposit their eggs directly into their host if the host is non-human and its offspring may be more successful at surviving if carried to their human host using an intermediate vector. Another study should be conducted to determine whether botfly larvae have a higher survival rate in smaller versus larger mammals.

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