



National  
Qualifications  
2016

X707/77/11

**Biology  
Supplementary Sheet**

MONDAY, 9 MAY

9:00 AM – 11:30 AM

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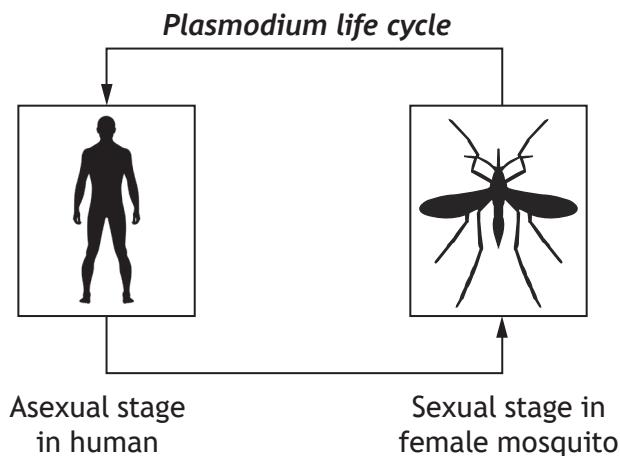
Supplementary Sheet for Question 1



\* X 7 0 7 7 7 1 1 \*

1. Malaria is caused by unicellular parasites in the genus *Plasmodium*. Figure 1 shows the life cycle of the parasite with respect to its human and mosquito hosts.

Figure 1

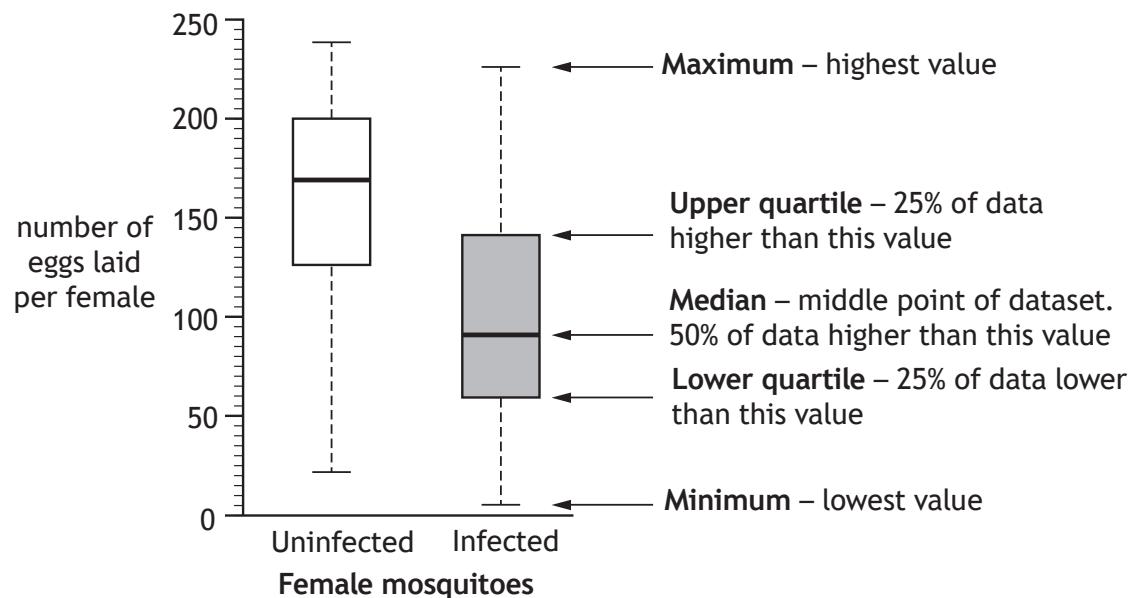


Malaria is a well-researched tropical disease of humans, but less is known about the effects of the parasite on its mosquito vector.

The parasite *Plasmodium relictum* causes malaria in birds. A recent study has been carried out to investigate the effects of this parasite on the mosquito *Culex pipiens*. In particular, two aspects were investigated: fecundity (number of eggs laid) and longevity (measured as survival after egg laying) of the mosquitoes.

In Figure 2, box-and-whisker plots show the total egg production by large numbers of uninfected and infected female mosquitoes.

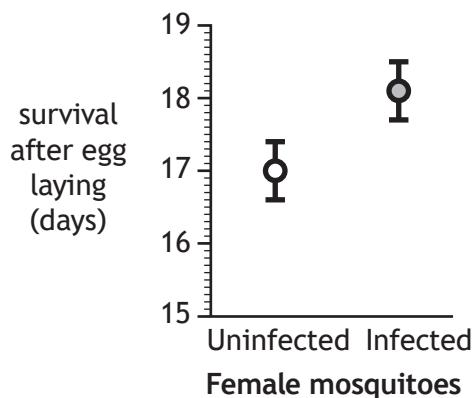
Figure 2



## 1. (continued)

Figure 3 shows mean survival times after egg laying for uninfected and infected female mosquitoes.

**Figure 3**

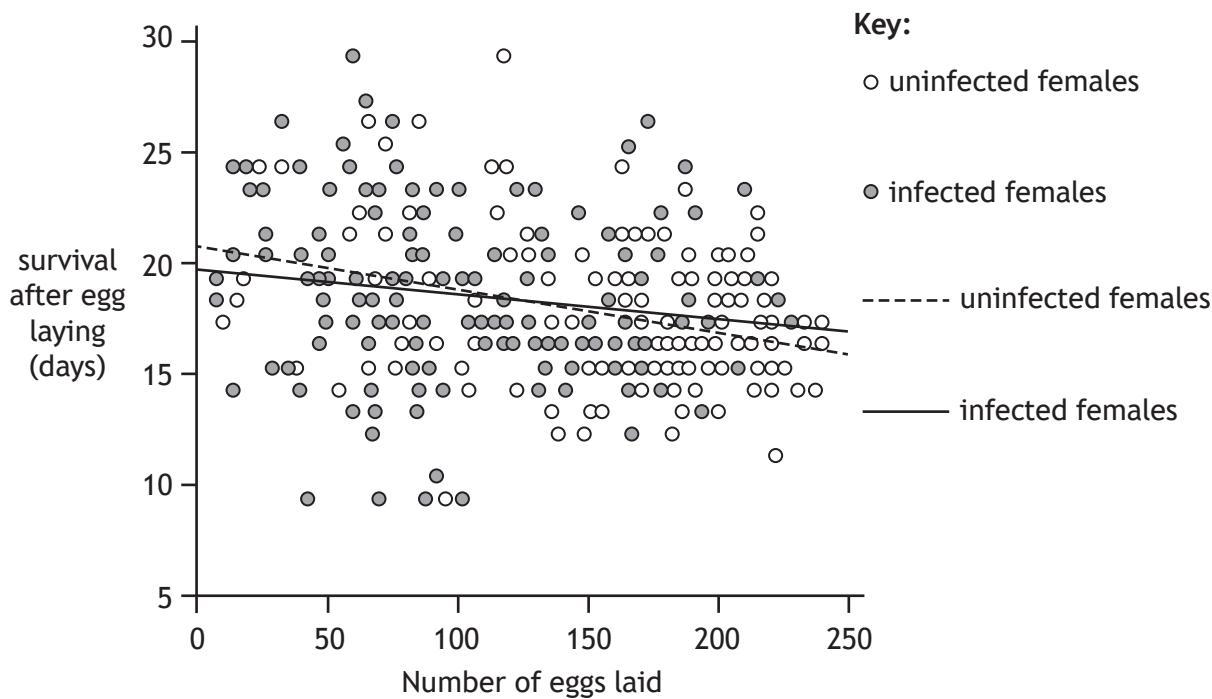


Fecundity and longevity were measured in the same individual female mosquitoes to see if there was a relationship between the two variables.

The lines of best fit for mosquito survival against the number of eggs each female laid were plotted for uninfected females and infected females.

This data is shown in Figure 4.

**Figure 4**



## ACKNOWLEDGEMENT

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