

Supplemental Appendix B: Individual components, full results.

Understanding uncertainty in temperature effects on
vector-borne disease: A Bayesian approach

Leah R. Johnson^{*1,2}, Tal Ben-Horin^{3,4}, Kevin D. Lafferty^{5,6},
Amy McNally⁷, Erin Mordecai^{3,8}, Krijn P. Paaijmans⁹,
Samraat Pawar^{1,10}, Sadie J. Ryan^{11,12,13}

- 1-Ecology and Evolution, University of Chicago;
- 2-Integrative Biology, University of South Florida;
- 3-Ecology, Evolution, and Marine Biology, UC Santa Barbara;
- 4-Marine and Coastal Sciences, Rutgers University;
- 5-Western Ecological Research Center, US Geological Survey;
- 6-Marine Science Institute, UC Santa Barbara;
- 7-Geography Department, UC Santa Barbara;
- 8-Biology, UNC Chapel Hill;
- 9-Barcelona Centre for International Health Research,
Universitat de Barcelona;
- 10-Department of Life Sciences, Imperial College;
- 11- Environmental and Forest Biology, SUNY ESF
- 12-Center for Global Health and Translational Science, SUNY UMU;
- 13 - School of Life Sciences College of Agriculture,
Engineering, and Science, University of KwaZulu-Natal,
Durban, South Africa

B.1 Possible impacts of prior information

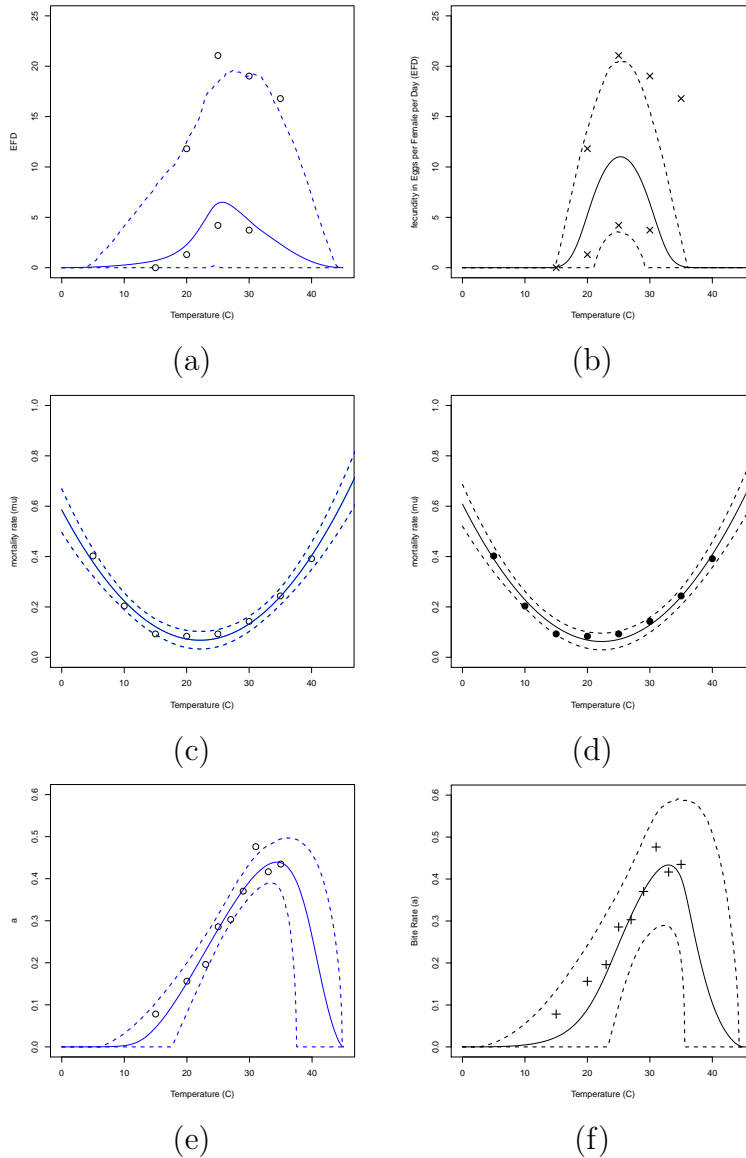


Figure B.1: Examples of the effects that informative priors can have on posterior predictions. **TOP: Decrease Uncertainty** – Fecundity (a) Fit with vague/non-informative priors. (b) Fit with informative priors. **Middle: No Effect** – adult mosquito mortality rate (c) Fit with vague/non-informative priors. (d) Fit with informative priors. **Bottom: Increase/Shift Uncertainty** – Bite Rate (e) Fit with vague/non-informative priors. (f) Fit with informative priors.

B.2 Bite Rate

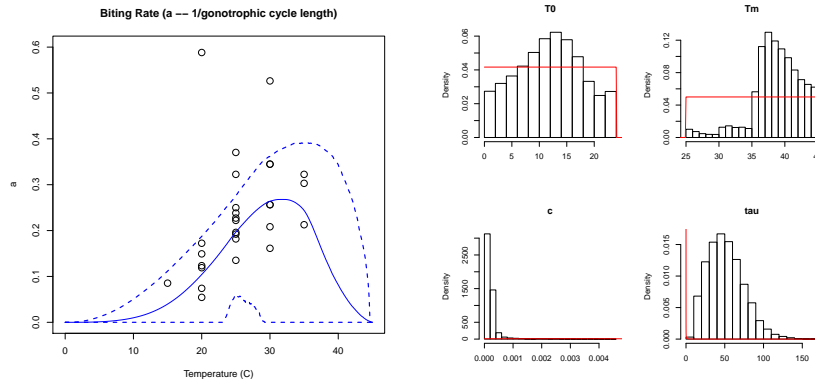


Figure B.2: Bite Rate – Fit and posterior draws of parameters used to elicit informative priors.

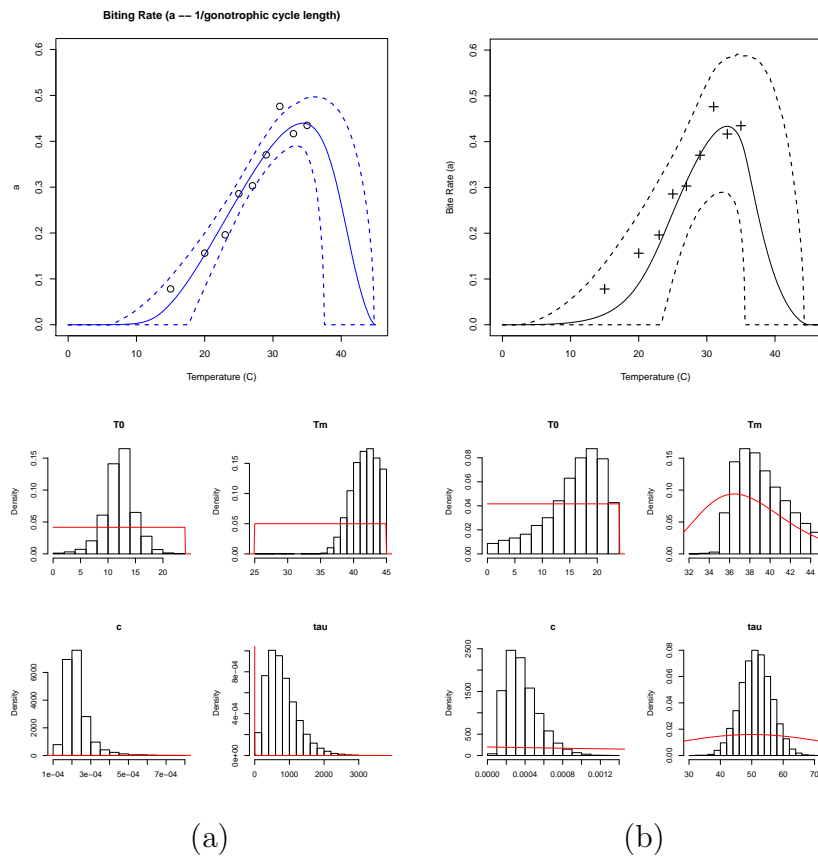


Figure B.3: Bite Rate (a) Fit and posterior draws of parameters with vague/non-informative priors. (b) Fit and posterior draws of parameters with informative priors.

B.3 Vector Competence

B.3.1 Brière Fit

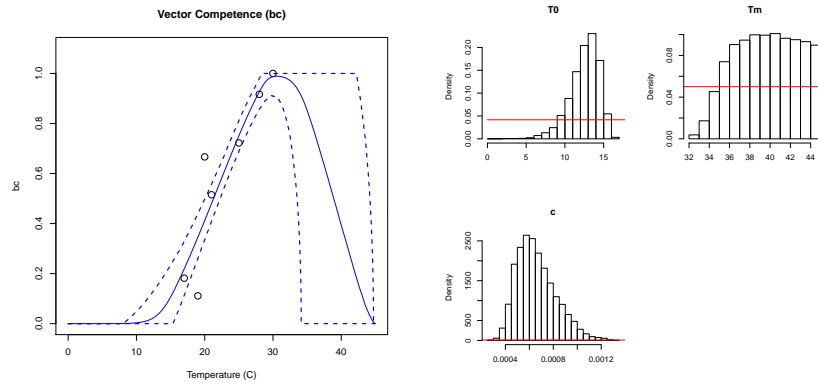


Figure B.4: Vector Competence – Brière response: Fit and posterior draws of parameters used to elicit informative priors.

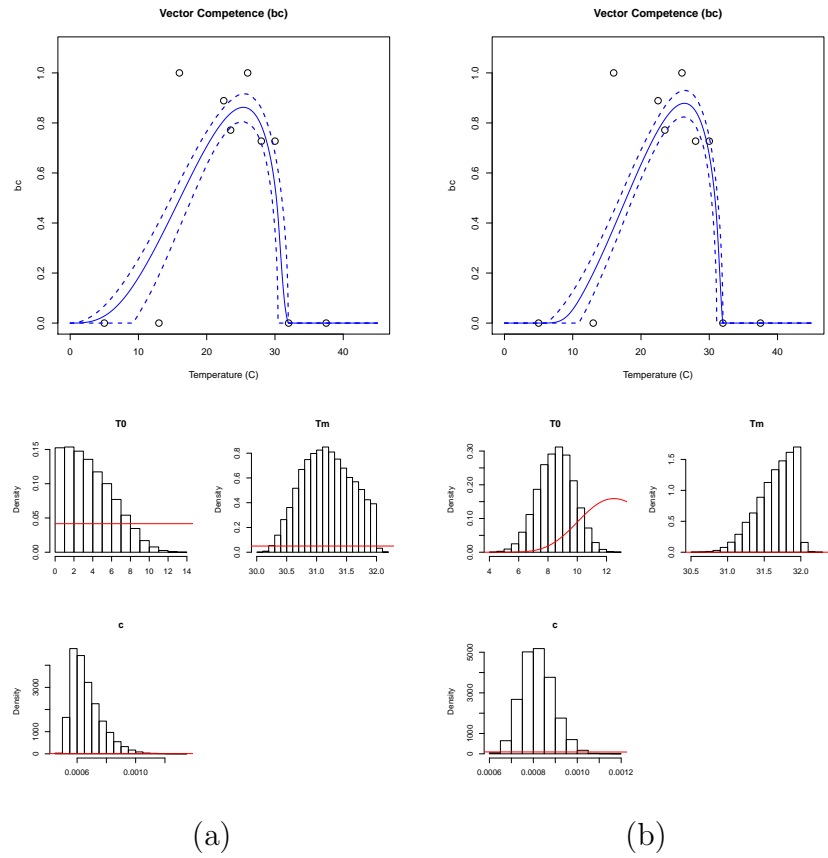


Figure B.5: Vector Competence – Brière response: (a) Fit and posterior draws of parameters with vague/non-informative priors. (b) Fit and posterior draws of parameters with informative priors.

B.3.2 Quadratic Fit

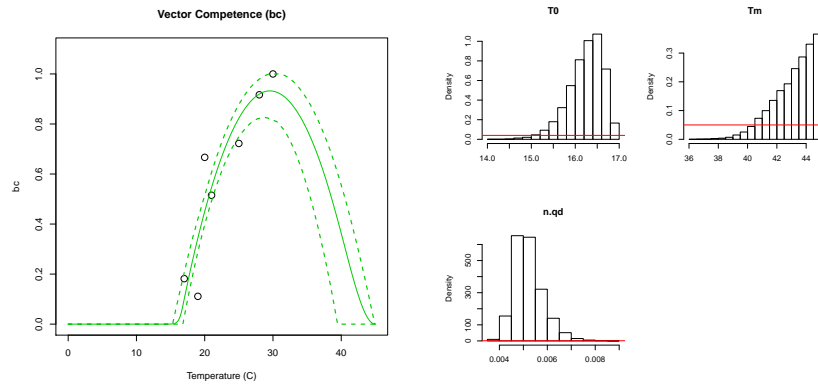
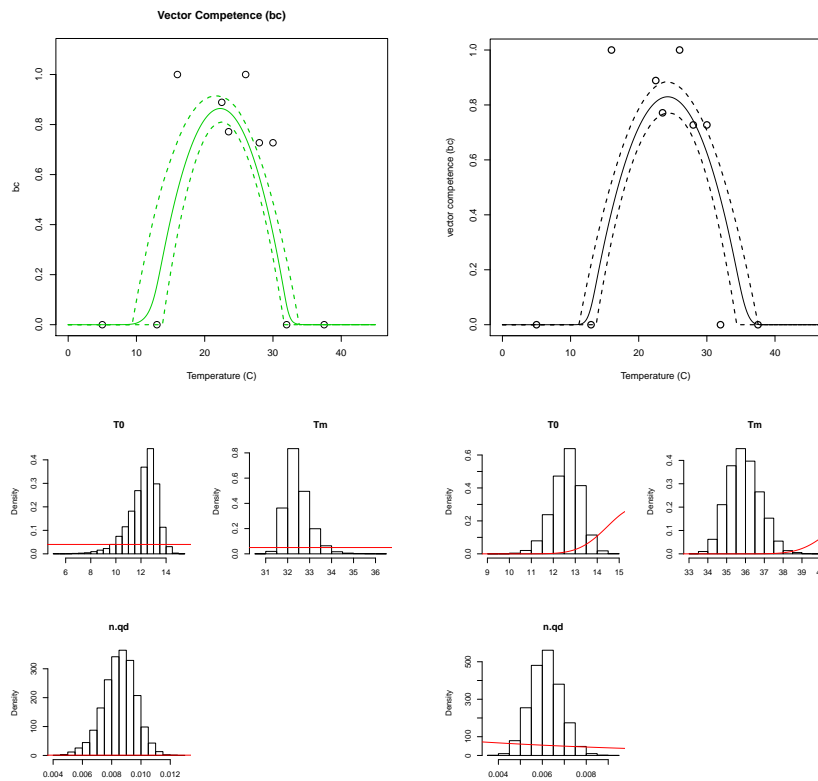


Figure B.6: Vector Competence – quadratic response: Fit and posterior draws of parameters used to elicit informative priors.



(a)

(b)

Figure B.7: Vector Competence – quadratic response: (a) Fit and posterior draws of parameters with vague/non-informative priors. (b) Fit and posterior draws of parameters with informative priors.

B.4 Egg to Adult survival

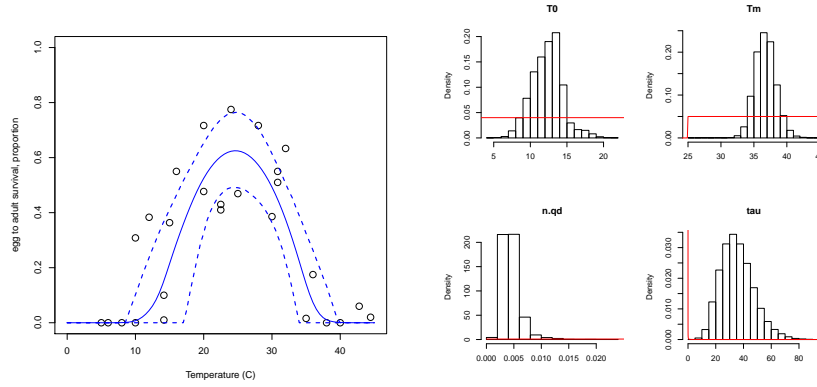


Figure B.8: Egg to Adult survival: Fit and posterior draws of parameters used to elicit informative priors.

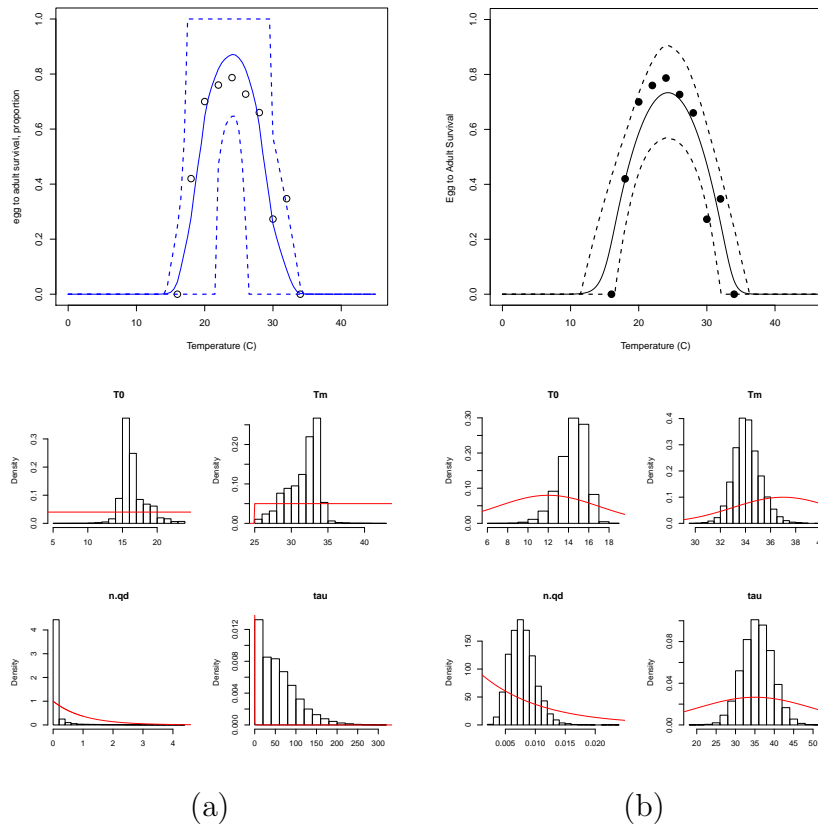


Figure B.9: Egg to Adult survival: (a) Fit and posterior draws of parameters with vague/non-informative priors. (b) Fit and posterior draws of parameters with informative priors.

B.5 Fecundity in Eggs per Female per Day (EFD)

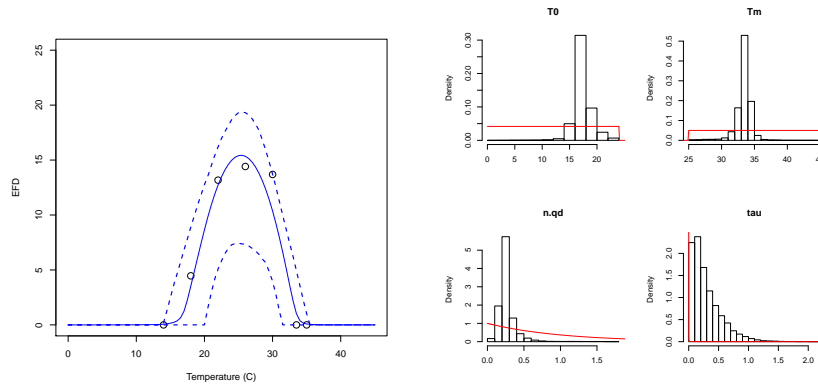


Figure B.10: Fecundity (EFD): Fit and posterior draws of parameters used to elicit informative priors.

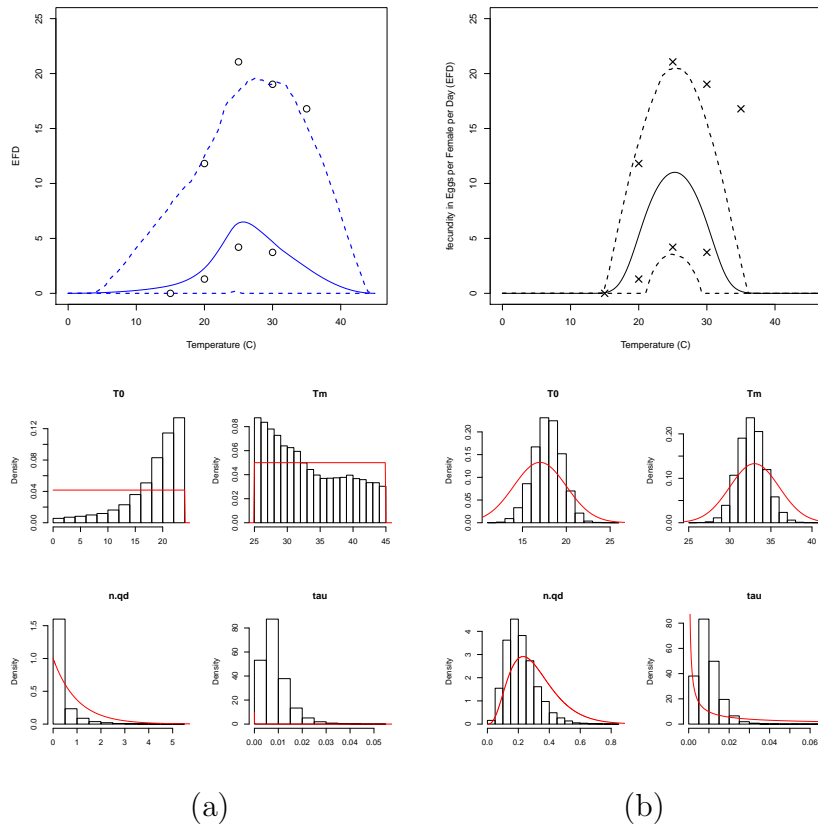


Figure B.11: Fecundity in Eggs per Female per Day (EFD): (a) Fit and posterior draws of parameters with vague/non-informative priors. (b) Fit and posterior draws of parameters with informative priors.

B.6 Mosquito Development Rate (MDR)

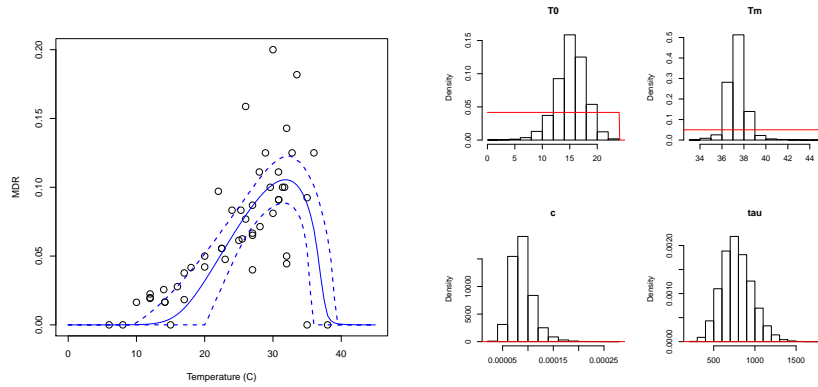


Figure B.12: MDR: Fit and posterior draws of parameters used to elicit informative priors.

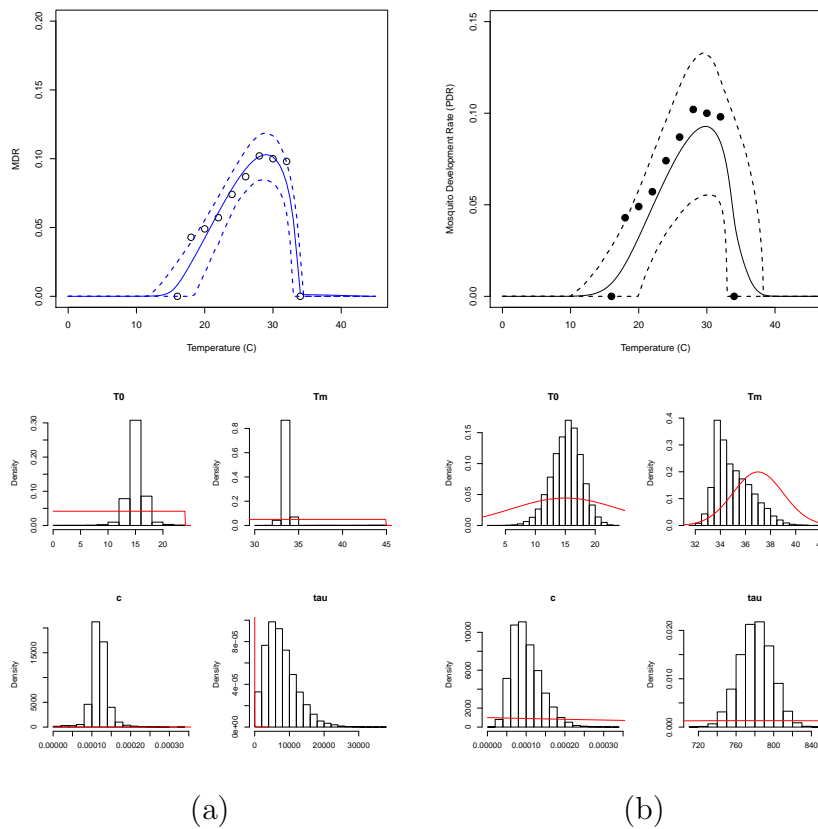


Figure B.13: Mosquito Development Rate (MDR): (a) Fit and posterior draws of parameters with vague/non-informative priors. (b) Fit and posterior draws of parameters with informative priors.

B.7 Mortality Rate (μ)

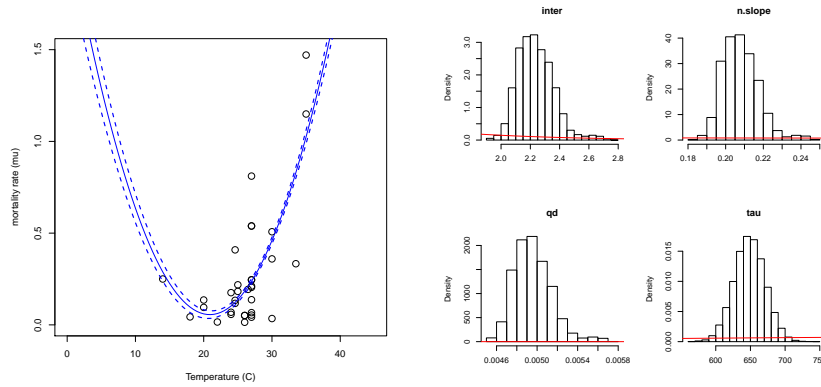


Figure B.14: Mortality rate (μ): Fit and posterior draws of parameters used to elicit informative priors.

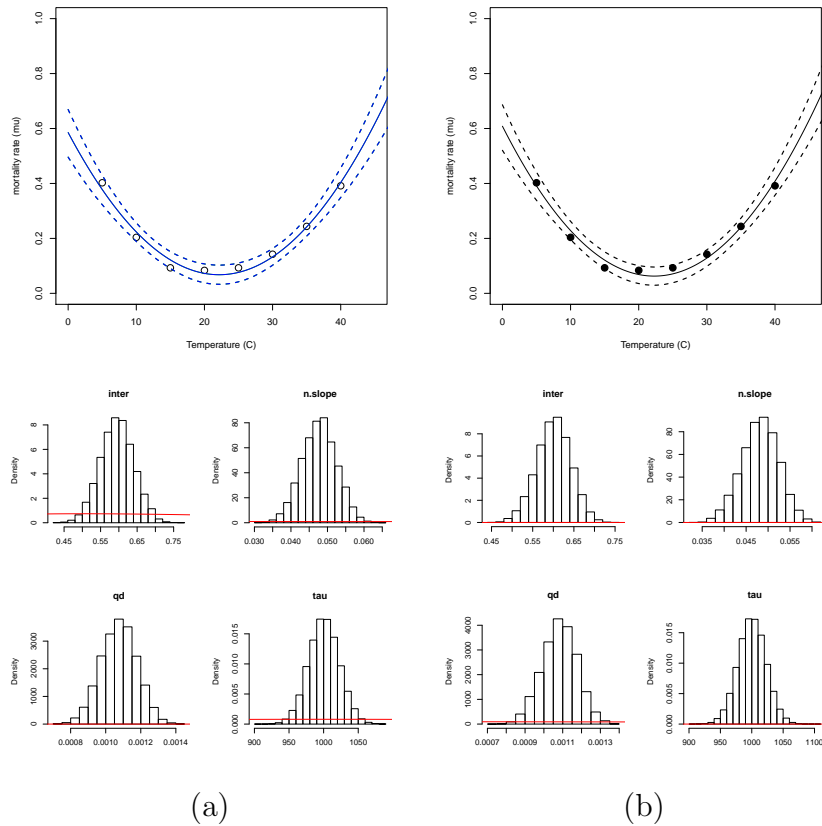


Figure B.15: Mortality rate (μ): (a) Fit and posterior draws of parameters with vague/non-informative priors. (b) Fit and posterior draws of parameters with informative priors.

B.8 Parasite Development Rate (PDR)

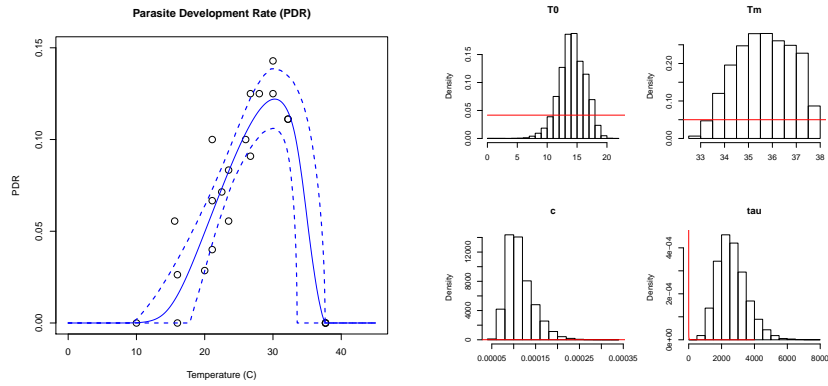


Figure B.16: PDR: Fit and posterior draws of parameters used to elicit informative priors.

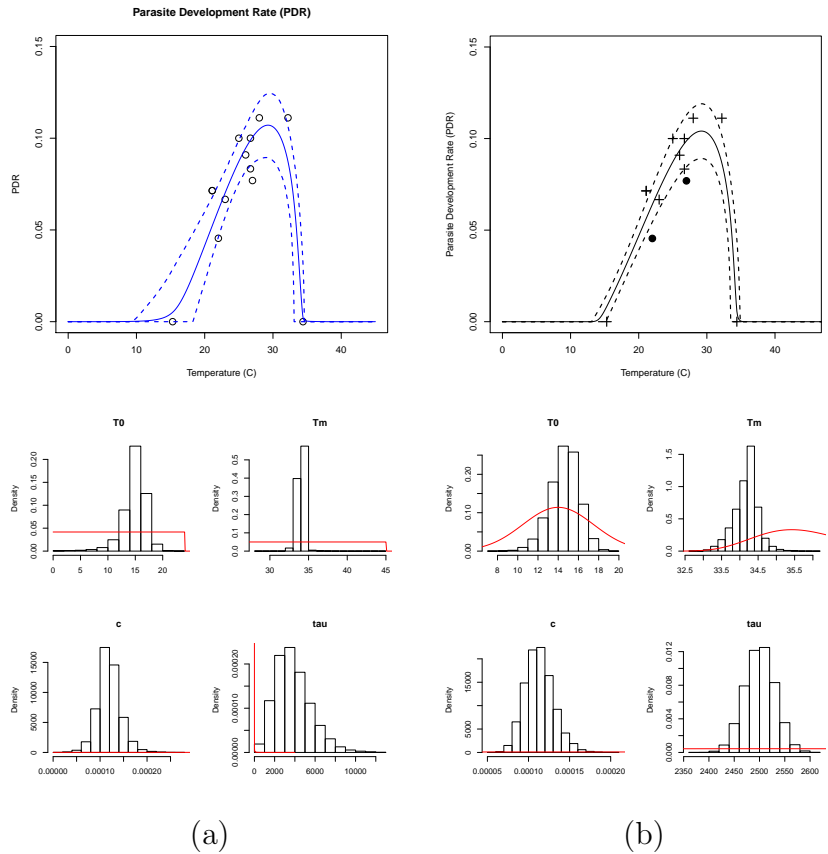


Figure B.17: Parasite Development Rate (PDR): (a) Fit and posterior draws of parameters with vague/non-informative priors. (b) Fit and posterior draws of parameters with informative priors.