**ReadMe Model parameters**

The following ReadMe gives a brief overview of the columns in “Habitat temperature parameters.csv and “Temperature response parameters.csv”.

**“Habitat temperature parameters.csv”:** Parameter values for the habitat temperature function (Eq. 5 in the manuscript) for each insect population.

* Population: Species name and geographical location (to distinguish between populations with

the same species name)

* Location: Geographical location, typically the country name followed by a name of the region

in which the insect was collected

* Latitude: Absolute latitude of insect population
* Habitat: Climate types based on the Köppen Climate Classification (Table S1 in the manuscript)
* meanT.r: Mean habitat temperature (in K) in the recent period (*MT,r* in Eq. 5)
* amplT.r: Amplitude of seasonal temperature fluctuations in the recent period (*AT,r* in Eq. 5)
* shiftT.r: Shift in the timing of the warmest temperatures in the recent period (*ST,r* in Eq. 5)
* delta\_mean.r: Long-term changes in mean temperature in the recent period (*ΔM,r* in Eq. 5)
* delta\_ampl.r: Long-term changes in the amplitude of seasonal temperature variation in the recent

period (*ΔA,r* in Eq. 5)

* meanT.f: Mean habitat temperature (in K) in the future period (*MT,f* in Eq. 5)
* amplT.f: Amplitude of seasonal temperature fluctuations in the future period (*AT,f* in Eq. 5)
* shiftT.f: Shift in the timing of the warmest temperatures in the future period (*ST,f* in Eq. 5)
* delta\_mean.f: Long-term changes in mean temperature in the future period (*ΔM,f* in Eq. 5)
* delta\_ampl.f: Long-term changes in the amplitude of seasonal temperature variation in the future

period (*ΔA,f* in Eq. 5)

**“Temperature response parameters.csv”:** Parameter values for each temperature response function (Eqs. 1-2; S2-3 in the manuscript) for each insect population

* Population: Species name and geographical location (to distinguish between populations with

the same species name)

* Location: Geographical location, typically the country name followed by a name of the region

in which the insect was collected

* Latitude: Absolute latitude of insect population
* Habitat: Climate types based on the Köppen Climate Classification (Table S1 in the manuscript)
* rMax: Maximum intrinsic growth rate, *rm*, at the optimum temperature (scaling in manuscript)
* Toptr: Optimal temperature (in K) for the intrinsic growth rate, *rm* (*Topt,r* in Eq. 1a)
* Tmaxr: Maximum temperature (in K) above which *rm* is negative (*Tmax,r* in Eq. 1a)
* sr: Variability about the optimum of the intrinsic growth rate, *rm* (*σr* in Eq. 1a)
* R0Topt: Maximum net reproductive rate at the optimum temperature (scaling in manuscript)
* ToptR0: Optimal temperature (in K) for the net reproductive rate (*Topt,R0* in Eq. 1b)
* sR0: Variability about the optimum of the net reproductive rate (*σR0* in Eq. 1b)
* bTopt: Maximum per capita birth rate at the optimum temperature (*bTopt* in Eq. 2a)
* Toptb: Optimal temperature (in K) for the per capita birth rate (*Topt,b* in Eq. 2a)
* sb: Variability about the optimum of the per capita birth rate (*σb* in Eq. 2a)
* TR: Reference temperature in K (*TR* in Eq. 2b,c)
* dJTR: Juvenile per capita mortality rate at the reference temperature ( in Eq. 2c)
* AdJ: Arrhenius constant for the juvenile per capita mortality rate (*AJ* in Eq. 2c)
* dATR: Adult per capita mortality rate at the reference temperature ( in Eq. 2c)
* AdA: Arrhenius constant for the adult per capita mortality rate (*AA* in Eq. 2c)
* gMax: Maximum development rate at the optimum temperature (*gmax* in Eq. 2c)
* gTR: Development rate at the reference temperature ( in Eq. 2c)
* Ag: Arrhenius constant for the development rate (*Ag* in Eq. 2c)
* TL: Low temperature constant (in K) of the development rate (*TL* in Eq. 2c)
* AL: Arrhenius constant for the low temperature of the development rate (*AL* in Eq. 2c)
* Toptg: Optimal temperature (in K) of the development rate (*Topt,g* in Eq. 2c)
* Tmaxg: Maximum temperature (in K) of the development rate (*Tmax,g* in Eq. 2c)
* Tmin: Minimum developmental temperature in K (*Tmin* in Eq. S3)
* aMax: Maximum strength of intraspecific competition (*αmax* = 0.25 in Eq. S2)