Oikos

**OIK-07170**

Schenone, L., Balseiro, E. G., Bastidas Navarro, M. and Modenutti, B. E. 2020. Modelling the consequence of glacier retreat on mixotrophic nanoflagellate bacterivory: a Bayesian approach. – Oikos doi: 10.1111/oik.07170

# Appendix 1

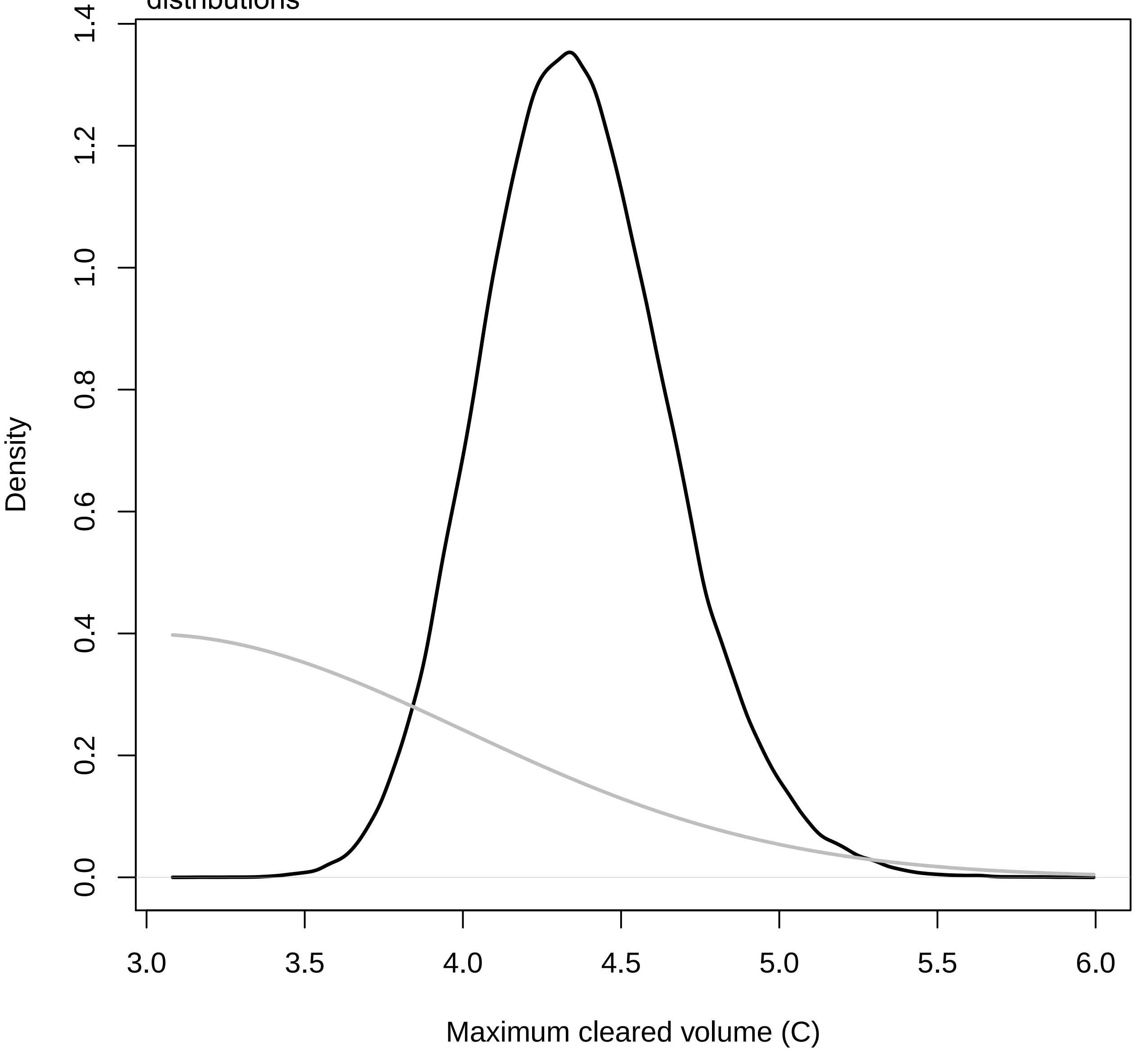
## JAGS syntax for the Bayesian-fitted model to evaluate the effects of light intensity and particle interference on mixotrophic nanoflagellate bacterivory

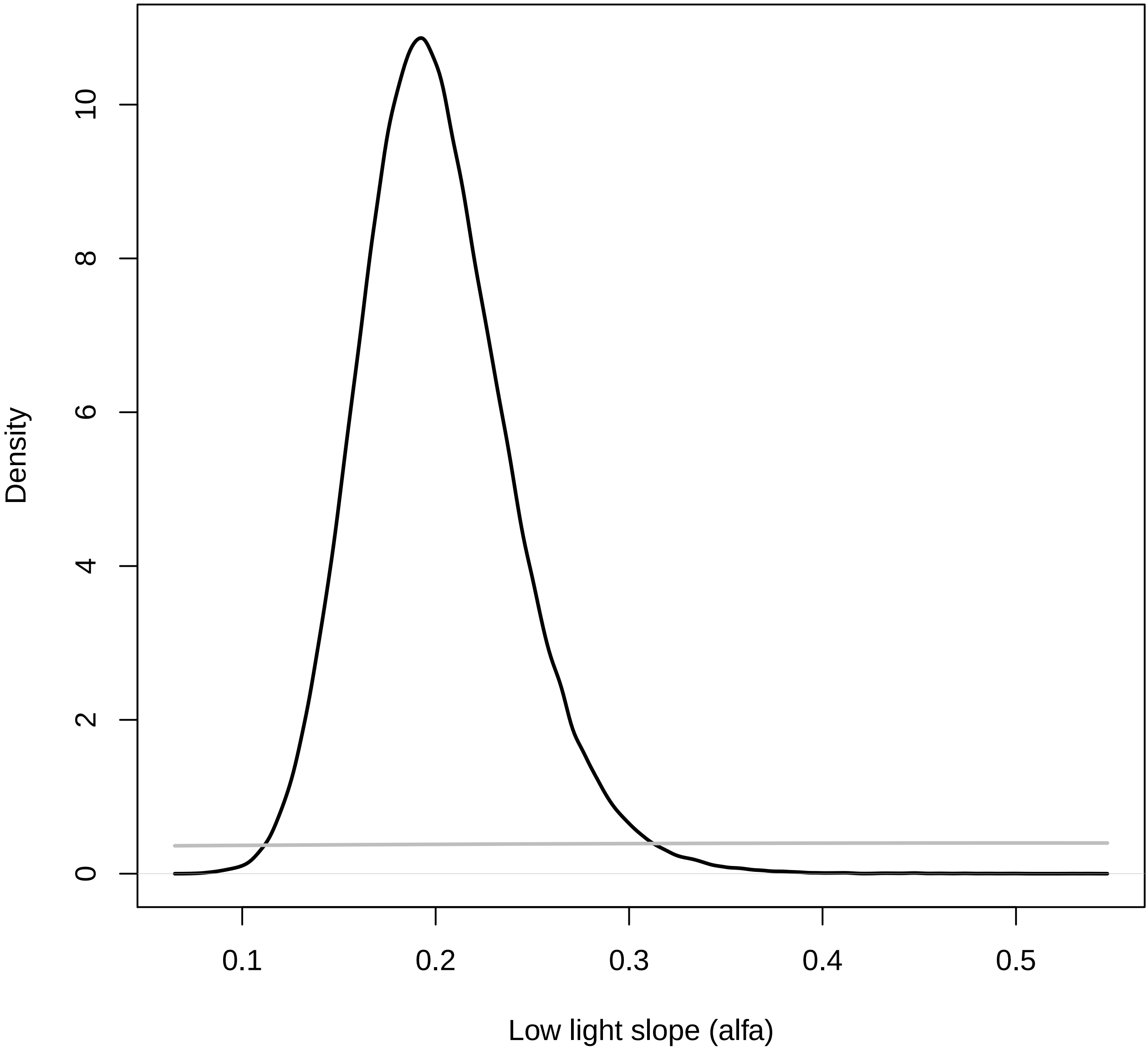
```
cat(file = "model.bug", "
   model {
   #Likelihood
    for (i in 1:obs) {
    prey[i] ~ dnorm(mu[i], tau)T(0,) #(process uncertainty)
    mu[i] <- (C * (1 - exp(-alfa * light[i] / C)) * exp(-beta * light[i] / C) + D * exp(-gamma *
light[i])) *      time[i] / (k + m * clay[i] + time[i])
   }
   #Priors (parameters uncertainty)
   C ~ dnorm(3, 1)T(0,)
   a ~ dnorm(0.5, 1)T(0,)
   b ~ dnorm(0.05, 10)T(0,)
   D ~ dnorm(2.5, 1)T(0,)
   d ~ dnorm(10, 1)T(0,)
   k ~ dnorm(0.1, 10)T(0,)
   m ~ dnorm(0, 1)
   tau <- 1 / (sigma * sigma)
   sigma ~ dexp(1)
   }")
```

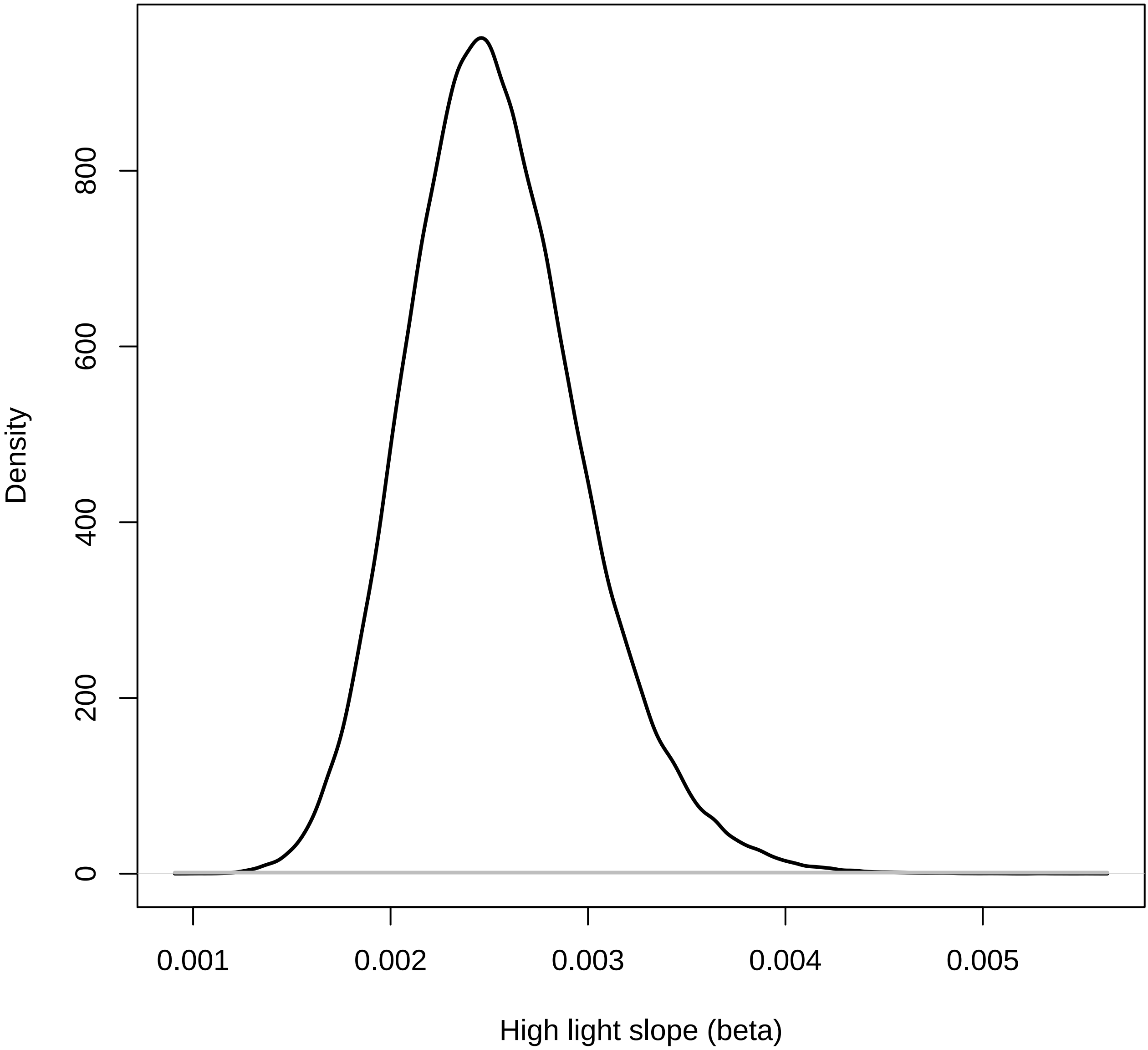
Terms for data input are the number of experimental units of all experiments (“obs” = 186), light intensity (“light”), glacial clay concentration (“clay”) and incubation time (“time”). Link parameters are the mean for process uncertainty (“mu”) and precision (Variance$^{-1}$) for process uncertainty (“tau”). Parameters to be estimated are the maximum cleared volume (“C”), cleared volume slope in low light conditions (“alfa”), cleared volume slope in high light conditions (“beta”), cleared volume under dark conditions (“D”), cleared volume decay under dark conditions (“gamma”), half maximum cleared volume without particles (“k”), particle interference coefficient (“m”) and standard deviation (“sigma”).

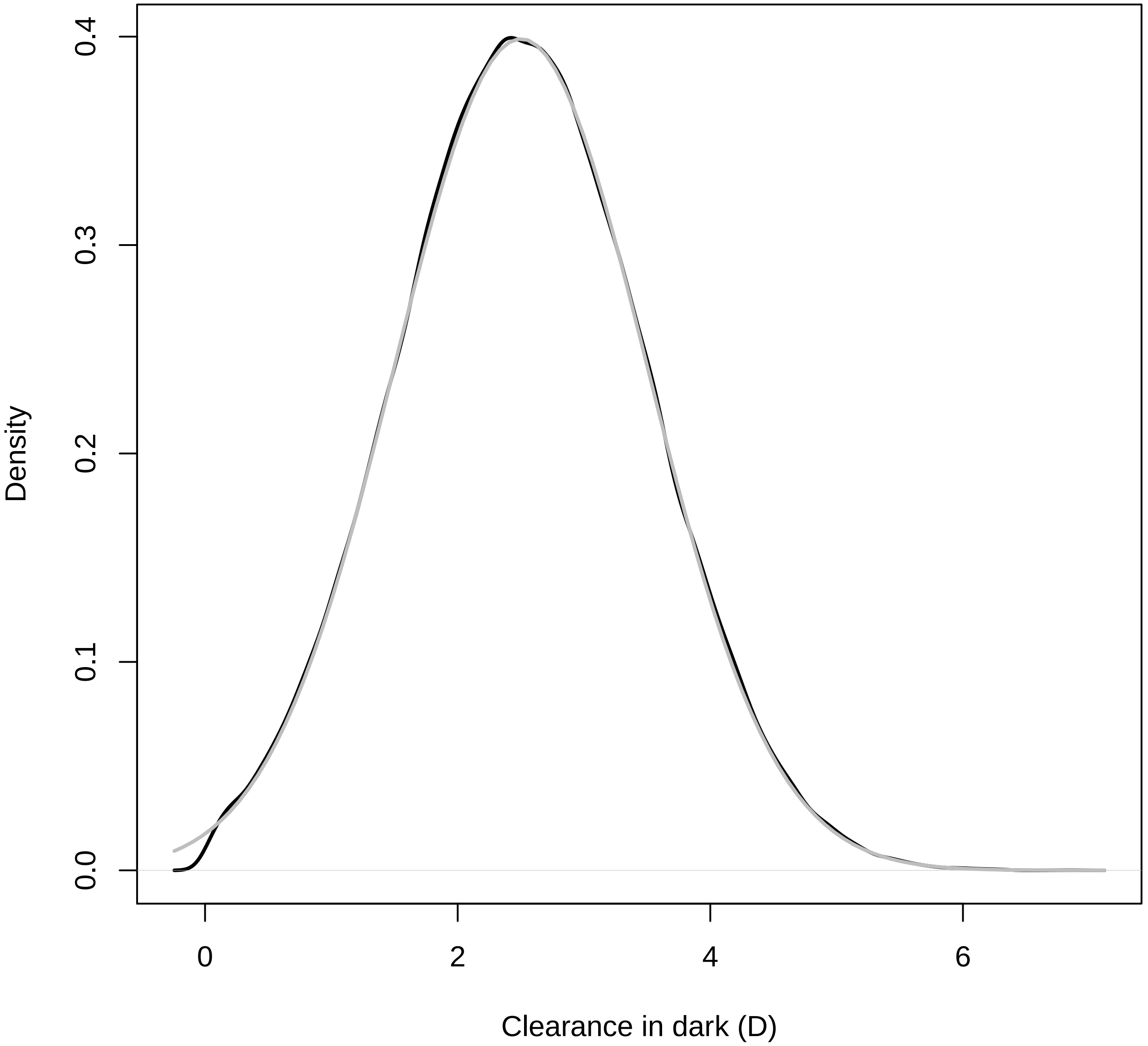
Appendix 2

Probability distributions of the parameters to be estimated in the model. Grey lines represent prior distributions while black lines represent posterior distributions

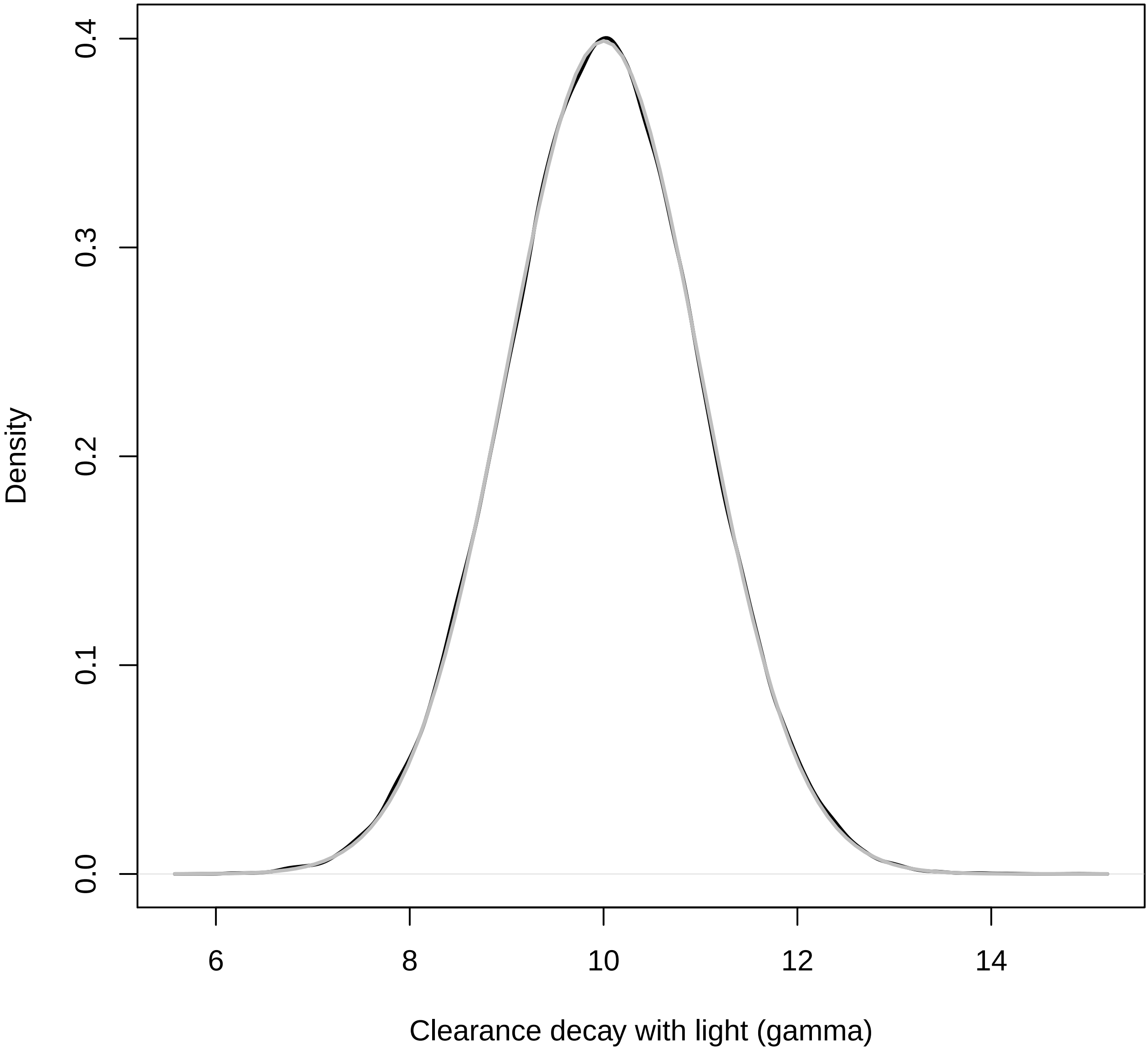



Density
0
2
4
6
8
10
0.1
0.2
0.3
0.4
0.5
Low light slope (alfa)

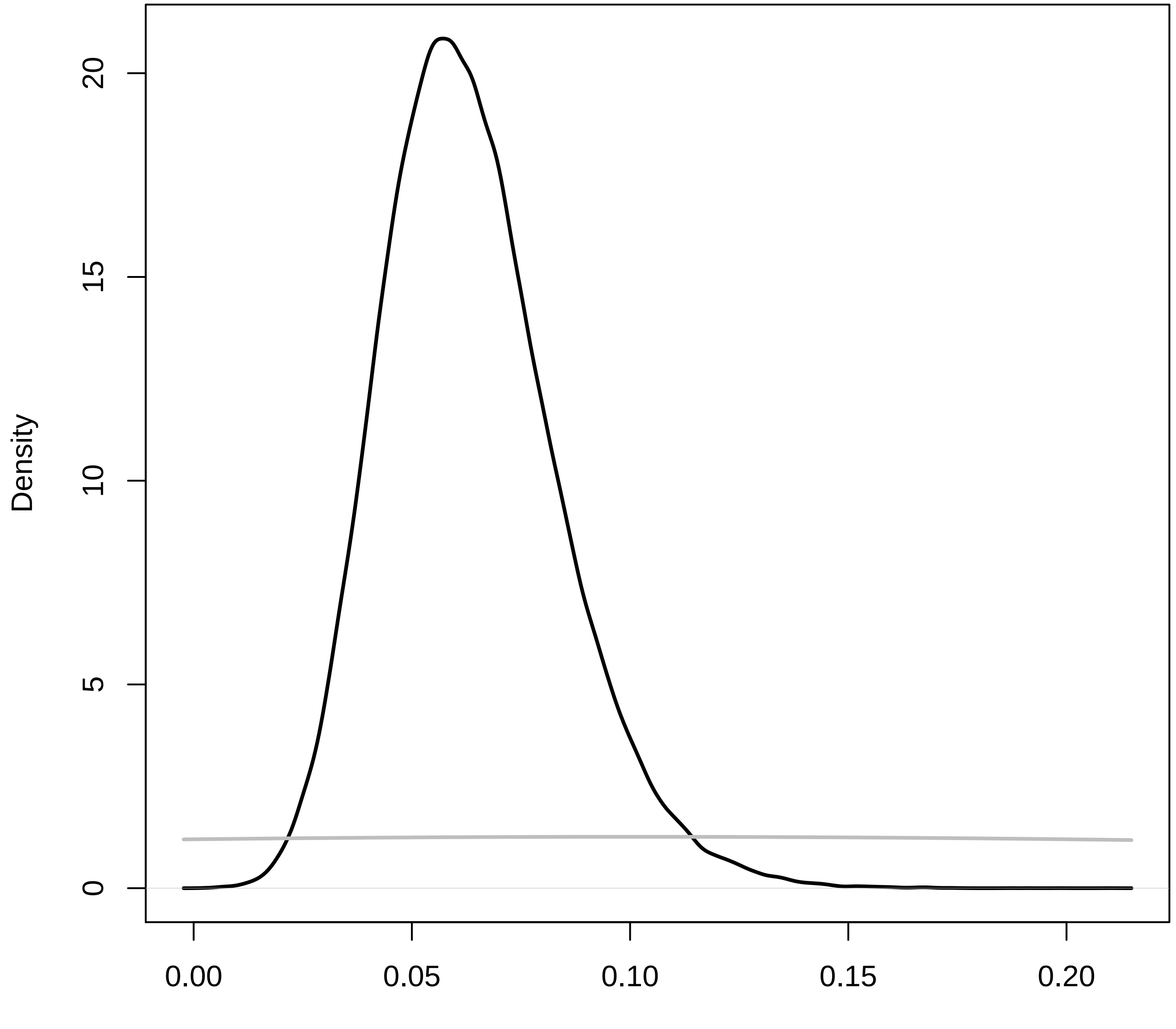

Density
0
200
400
600
800
0.001
0.002
0.003
0.004
0.005
High light slope (beta)

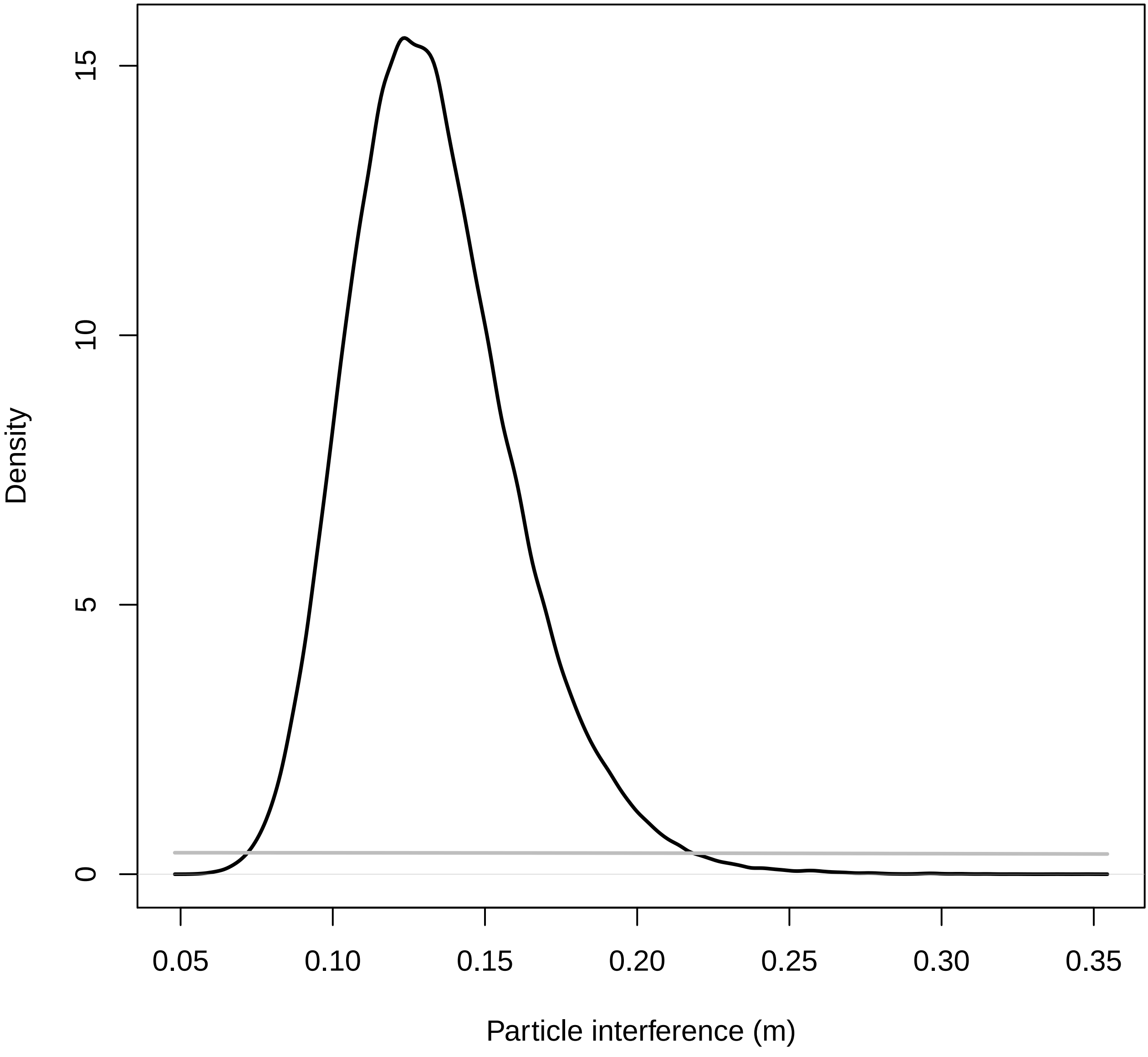


0.0
0.1
0.2
0.3
0.4
Density
0
2
4
6
Clearance in dark (D)

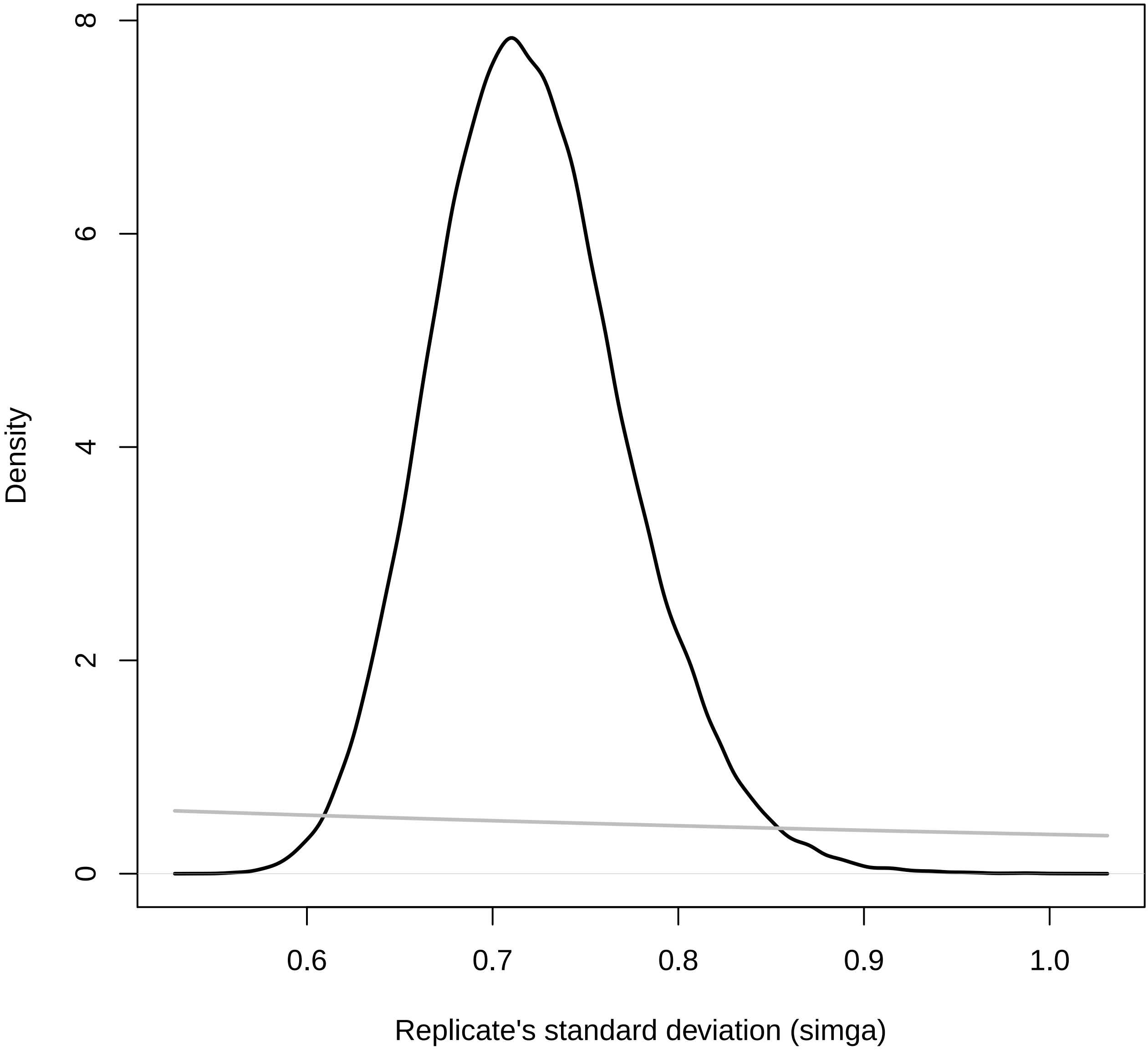


Density
0.0
0.1
0.2
0.3
0.4
6
8
10
12
14
Clearance decay with light (gamma)


Density
20
15
10
5
0
0.00
0.05
0.10
0.15
0.20
Handling time (k)



Density
15
10
5
0
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Particle interference (m)


8
6
4
2
0
Density
0.6
0.7
0.8
0.9
1.0
Replicate's standard deviation (simga)