**Lab 5**

There isn’t a special lab for Chapter 5, but it is useful to work through the codes in the chapter. Skip paragraphs 5.2.2.2 (p. 153-156) and 5.3.1.3 (pp. 162-168)

**Corrections to the chapter**

To be consistent with formula (eq. 5.2.1) on page 152, the R code below Fig. 5.2 on p. 151 should be:

> y\_det = a[g]\*b[g]/(b[g]+x)

> y = rnbinom(50, mu = y\_det, size = k)

If you decide to do 5.2.2.2 (not advised):

On page 155, middle of page, Bolker writes

This should be

In Fig. 5.5a, the tails of the distribution under H0 (to the left and right of the vertical hatched lines) represent each a probability of (and together ). The vertical axis of Fig. 5.5b represents P(reject H0|Effect size).

On page 159, line 9, “confidence intervals” should be “confidence limits”. Given the usage of the “hat” in , it seems appropriate to use and .

The code on page 161 should be:

> y\_det = a[g]\*b[g]/(b[g]+x)

> m0 = mle2(y~dnbinom(mu = a \* b/(b+x), size = k),

+ start = list(a = 15, b = 1, k = 5)

> m1 = mle2(y~dnbinom(mu = a \* b/(b+x), size = k),

+ parameters = list(a ~ g, b ~ g), start = list(a = 15, + b = 1, k = 5)

**To run this code, a, b, and g need to be put in a data frame. See example code below:**

###############################################

# step 1: simulate data see p. 150

###############################################

a=20

b=1

k=5

x=runif(50, min=0, max=5)

y\_det=a\*b/(b+x)

y= rnbinom(50, mu=y\_det, size=k)

plot(x,y)

dat <- data.frame(x,y)

###################################################

### step  2: 2 groups

###################################################

g=factor(rep(1:2, each=25))

a=c(20,10)

b=c(1,2)

k=5

x=runif(50, min=0, max=5)

y\_det=a[g]\*b[g]/(b[g]+x)

y= rnbinom(50, mu=y\_det, size=k)

plot(x,y, col=g)

dat <- data.frame(x,y,g)

###################################################

### step  2: likelihood

###################################################

library(bbmle)

# the same parameters for both groups

m0 <- mle2(y~dnbinom(mu=a\*b/(b+x), size=k),data=dat, start=list(a=15,b=1,k=5))

# different parameters for both groups

m1 <- mle2(y~dnbinom(mu=a\*b/(b+x), size=k),parameters = list(a ~ g, b ~g), data=dat, start=list(a=15,b=1,k=5))