

R version 2.14.1 (2011-12-22)
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Platform: x86_64-pc-mingw32/x64 (64-bit)

```
> library(MEMSS)
Loading required package: lme4
Loading required package: Matrix
Loading required package: lattice
```

Attaching package: 'Matrix'

The following object(s) are masked from 'package:base':

det

Attaching package: 'lme4'

The following object(s) are masked from 'package:stats':

AIC, BIC

Warning message:

package 'MEMSS' was built under R version 2.14.2

```
> head(Orange) #get data
```

```
Tree age circumference
1 A 118 30
2 A 484 58
3 A 664 87
4 A 1004 115
5 A 1231 120
6 A 1372 142
```

```
> xyplot(circumference ~ age | Tree, Orange, type = c("g","b"),
+ index = function(x,y) coef(lm(y ~ x))[1],
+ xlab = "Age - 1968/12/31",
+ ylab = "Circumference (mm)", aspect = "xy")
> # connect-the-dots, frame-by-frame
```

```
> # connect-the-dots, all 5 trees
> xyplot(circumference ~ age, Orange, groups = Tree, type = c("g", "b"),
+ auto.key = list(space = "right", lines = TRUE), aspect = "xy",
+ xlab = "Age (days since 1968/12/31)", ylab = "Circumference (mm)")
```

```
> ?SSlogis
starting httpd help server ... done
```

```
> # random asymptote model, provide starting values
> m1 <- nlmer(circumference ~ SSlogis(age, Asym, xmid, scal) ~ Asym|Tree,
+ Orange, start = c(Asym = 190, xmid = 730, scal = 350))
> print(m1)
```

Nonlinear mixed model fit by the Laplace approximation

Formula: circumference ~ SSlogis(age, Asym, xmid, scal) ~ Asym | Tree

Data: Orange

AIC	BIC	logLik	deviance
1901	1908	-945.3	1891

Random effects:

Groups	Name	Variance	Std.Dev.
Tree	Asym	53985.687	232.348
	Residual	52.868	7.271

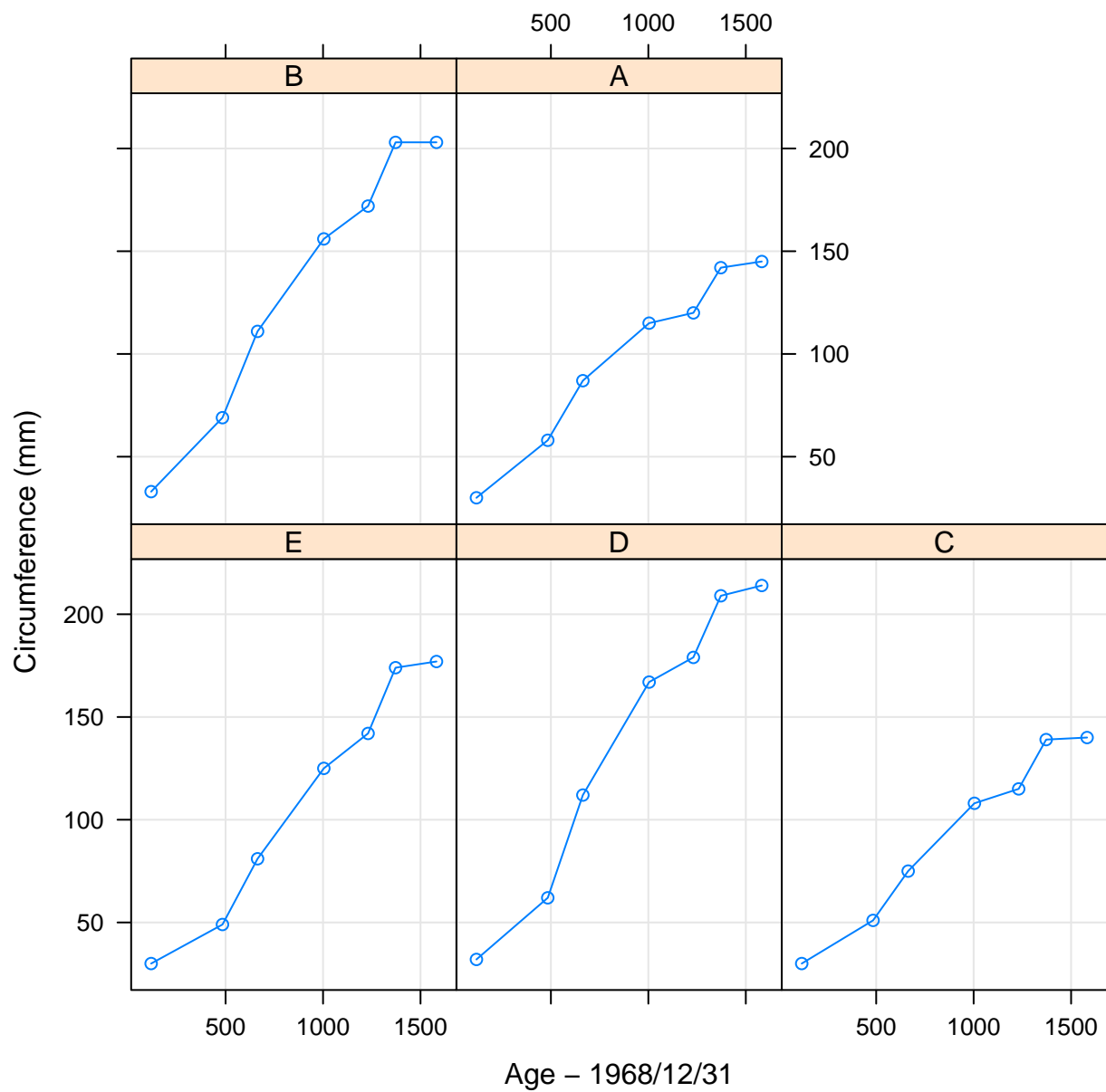
Number of obs: 35, groups: Tree, 5

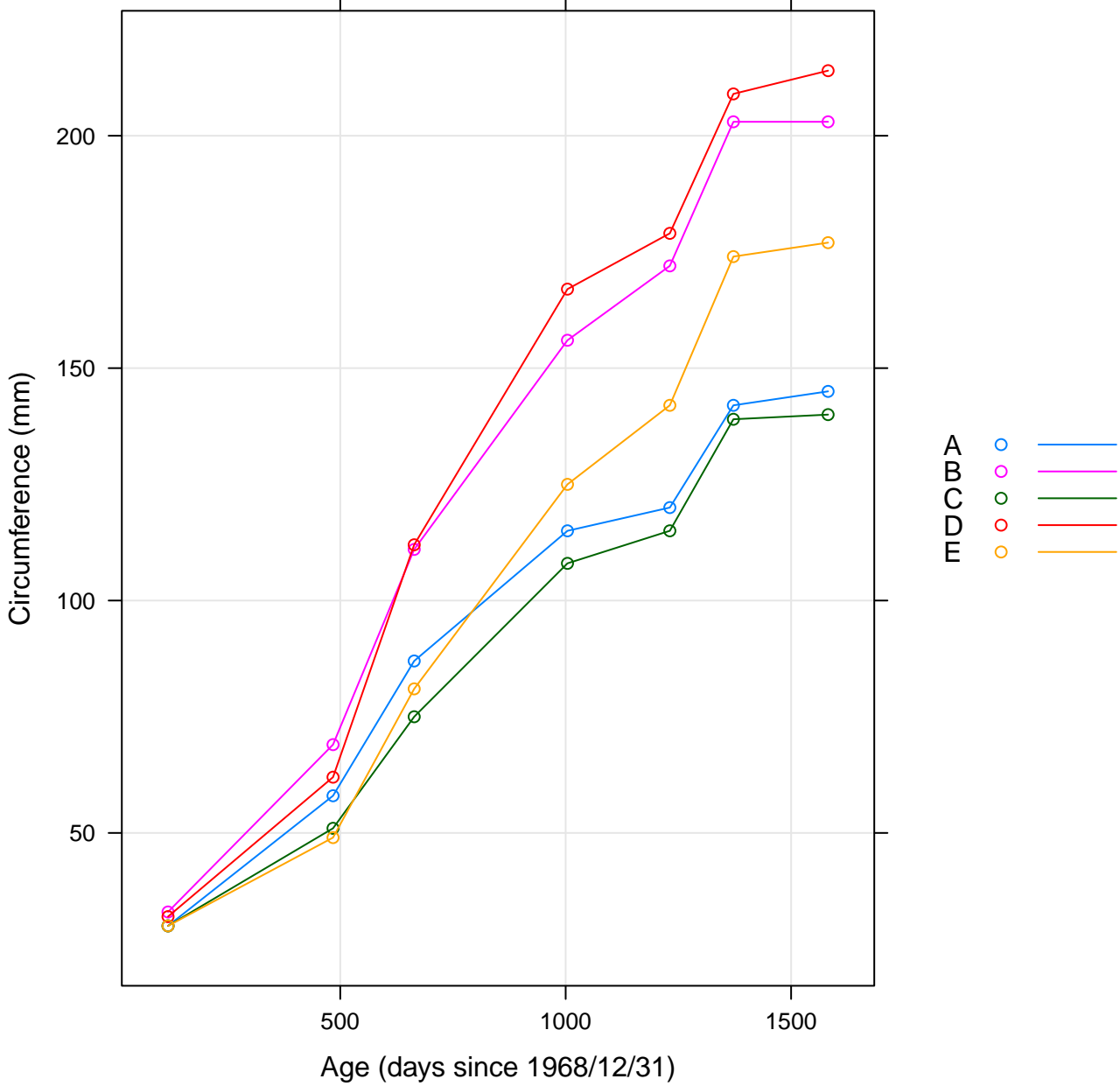
Fixed effects:

	Estimate	Std. Error	t value
Asym	192.04	104.09	1.845
xmid	727.89	31.97	22.771
scal	347.97	24.42	14.252

Correlation of Fixed Effects:

	Asym	xmid
xmid	0.053	





```

scal 0.050 0.763
> ranef(m1)
$Tree
  Asym
A -30.143978
B  32.352056
C -37.925243
D  41.016168
E  -5.299086

> fixef(m1)
  Asym      xmid      scal
192.0410 727.8908 347.9680

> #Independent random effects for each parameter
> nm2 <- nlmer(circumference ~ SSlogis(age, Asym, xmid, scal) ~
+             (Asym | Tree) + (xmid | Tree) + (scal|Tree), Orange,
+             start = c(Asym = 200, xmid = 770, scal = 120)),
Error: unexpected ',' in:
"
  (Asym | Tree) + (xmid | Tree) + (scal|Tree), Orange,
  start = c(Asym = 200, xmid = 770, scal = 120)),"
>
  corr = FALSE)
Error: unexpected ')' in "      corr = FALSE)"
> nm2 <- nlmer(circumference ~ SSlogis(age, Asym, xmid, scal) ~
+             (Asym | Tree) + (xmid | Tree) + (scal|Tree), Orange,
+             start = c(Asym = 200, xmid = 770, scal = 120))

> print(nm2)
Nonlinear mixed model fit by the Laplace approximation
Formula: circumference ~ SSlogis(age, Asym, xmid, scal) ~ (Asym | Tree) + (xmid | Tree) + (scal | Tree)
Data: Orange
  AIC  BIC logLik deviance
1381 1392 -683.6   1367
Random effects:
Groups   Name Variance Std.Dev.
Tree     Asym 34037.991 184.4939
Tree     xmid 201573.121 448.9690
Tree     scal 42152.968 205.3119
Residual              36.817   6.0677
Number of obs: 35, groups: Tree, 5

Fixed effects:
      Estimate Std. Error t value
Asym    192.77      82.69   2.331
xmid    726.14     203.17   3.574
scal    355.44     94.71   3.753

Correlation of Fixed Effects:
      Asym xmid
xmid 0.009
scal 0.014 0.029

> anova(nm2,m1)
Data: Orange
Models:
m1: circumference ~ SSlogis(age, Asym, xmid, scal) ~ Asym | Tree
nm2: circumference ~ SSlogis(age, Asym, xmid, scal) ~ (Asym | Tree) +
      (xmid | Tree) + (scal | Tree)
      Df      AIC      BIC logLik Chisq Chi Df Pr(>Chisq)
m1    5 1900.6 1908.4 -945.31
nm2   7 1381.2 1392.1 -683.62 523.38    2 < 2.2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

> ranef(nm2)
$Tree
  Asym      xmid      scal
A -38.24274 -96.198290  8.725296
B  26.38468 -25.135563 -22.259975
C -34.66581  4.204902 41.263462
D  32.80133 -14.454234 -51.113890
E  13.21907 128.902165  20.808136

> fixed(nm2)
Error: could not find function "fixed"

```

```

> fixef(nm2)
      Asym      xmid      scal
192.7677 726.1407 355.4370
> #Correlated random effects for Asym and scal only
> nm3 <- nlmer(circumference ~ SSlogis(age, Asym, xmid, scal) ~
+             (Asym + scal|Tree), Orange,
+             start = c(Asym = 200, xmid = 770, scal = 120))
> print(nm3)
Nonlinear mixed model fit by the Laplace approximation
Formula: circumference ~ SSlogis(age, Asym, xmid, scal) ~ (Asym + scal | Tree)
Data: Orange
      AIC      BIC logLik deviance
1573 1584 -779.7   1559
Random effects:
Groups   Name Variance Std.Dev. Corr
Tree     Asym 36734.900 191.6635
         scal 93569.160 305.8908 -0.680
Residual      42.887   6.5488
Number of obs: 35, groups: Tree, 5

Fixed effects:
      Estimate Std. Error t value
Asym    194.09      85.89   2.260
xmid    735.97      28.75  25.595
scal    365.99     138.73   2.638

Correlation of Fixed Effects:
      Asym      xmid
xmid  0.058
scal -0.660  0.120
> ranef(nm3)
$Tree
      Asym      scal
A -24.457746  69.93741
B  32.088680 -12.03847
C -35.066052  35.87508
D  36.585858 -47.24177
E  -9.175625 -46.86463
>

```