A note on scale

We will use the Aitchison compositional scale (acomp):

1. The stats textbook recommends using acomp for count data,

2. The underlying distribution is likely acomp

3. The total of the composition is large enough to avoid

random selection error in counts

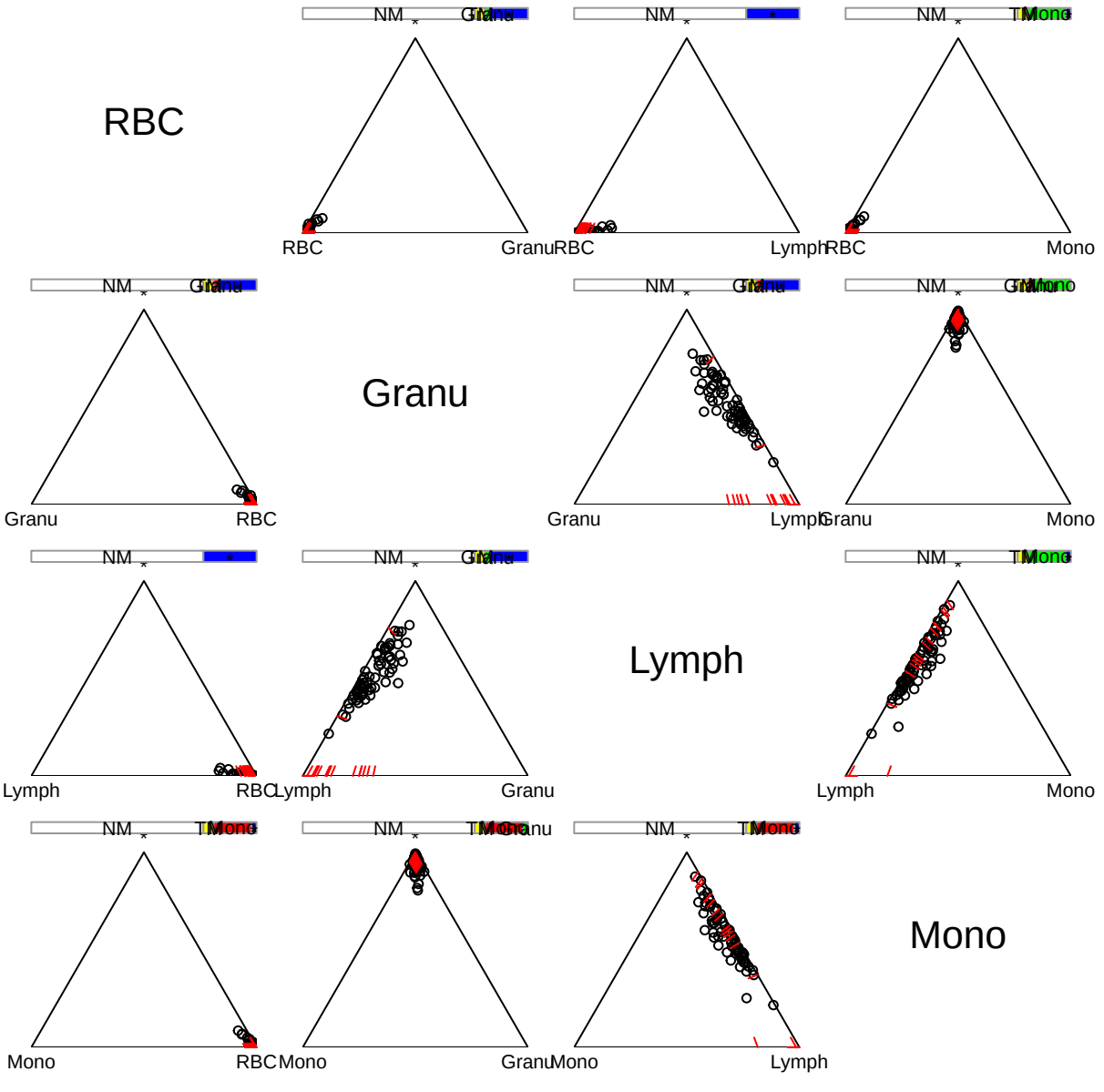
D21

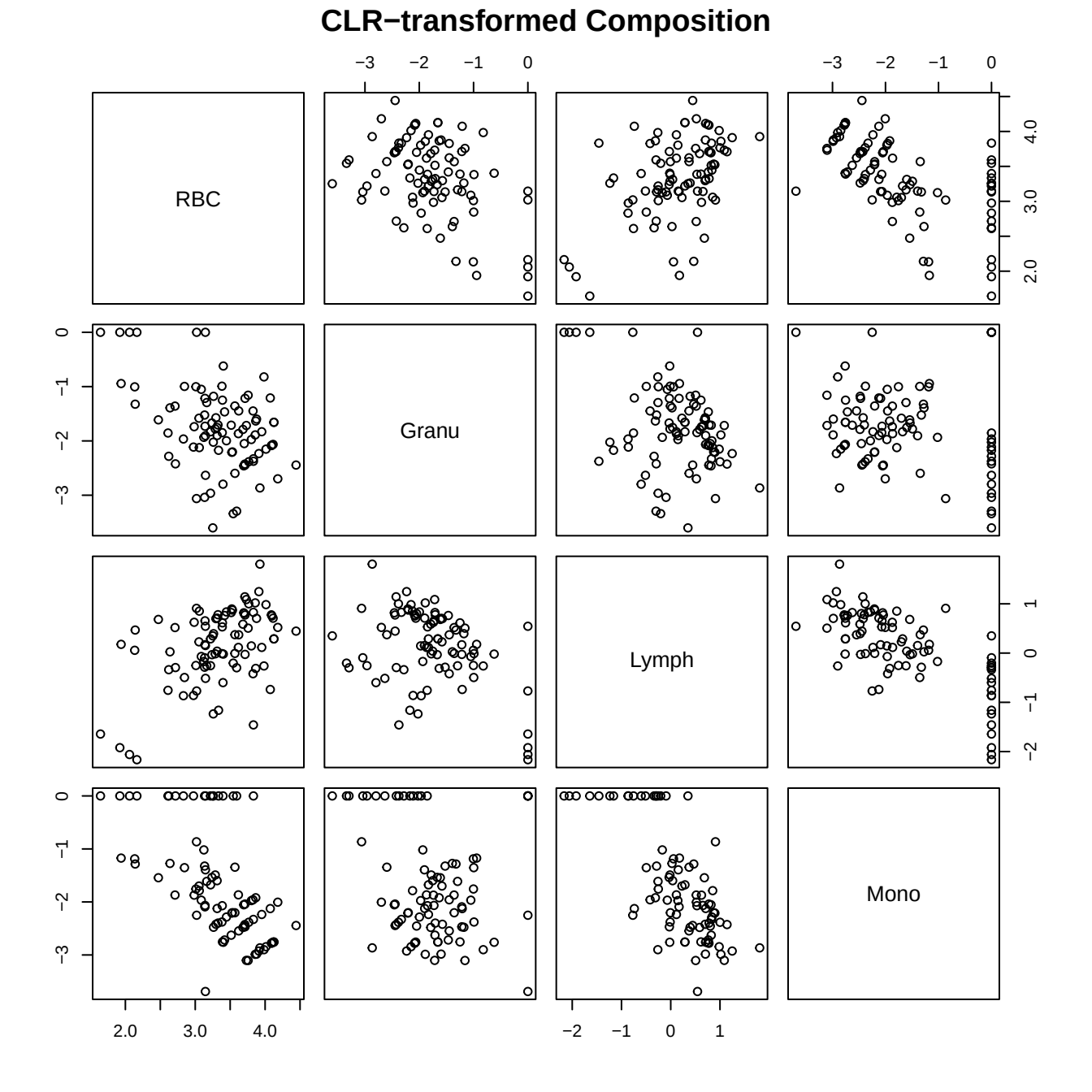
Day 21 only (1000s)

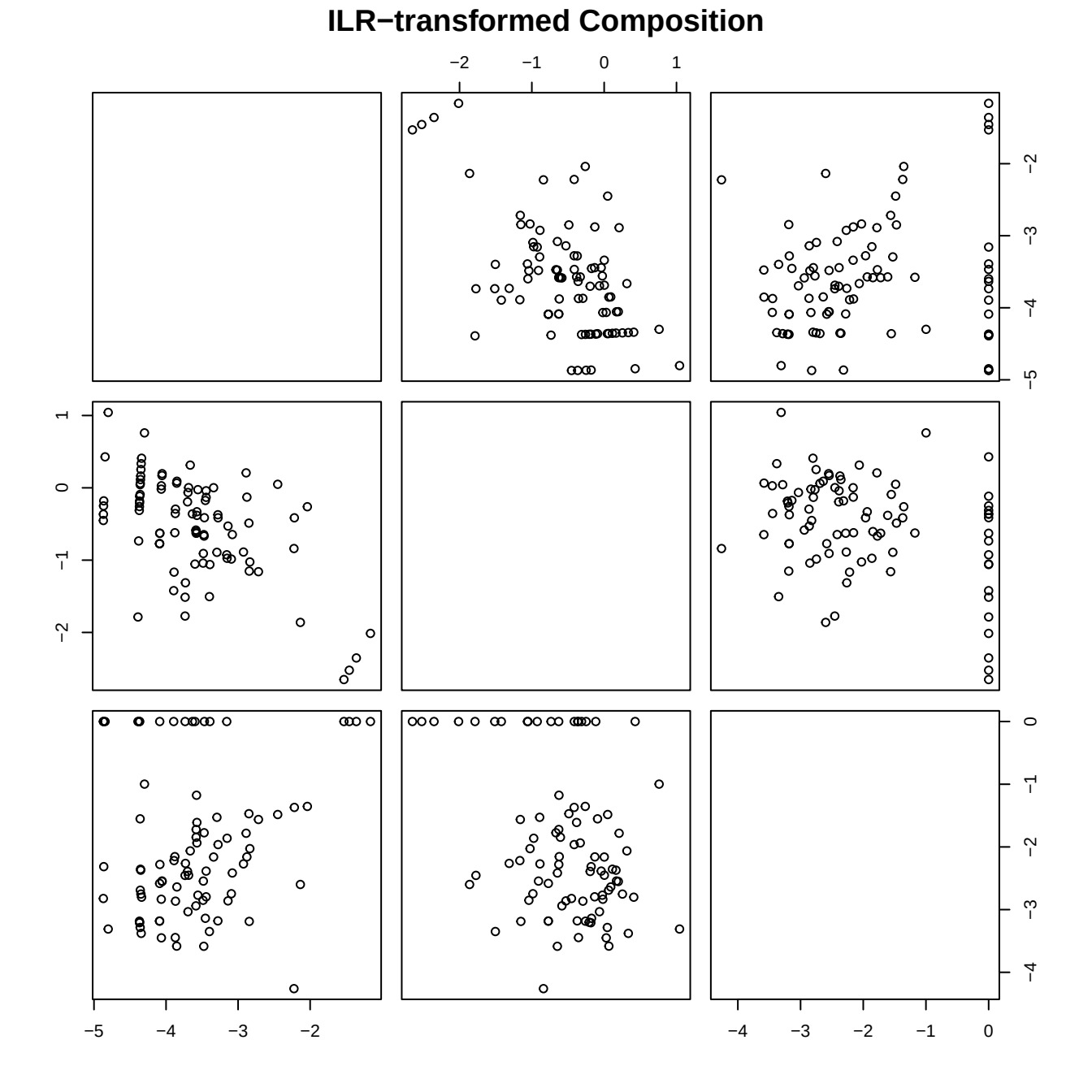
Graphical Exploration of Composition

D21

Untransformed Composition



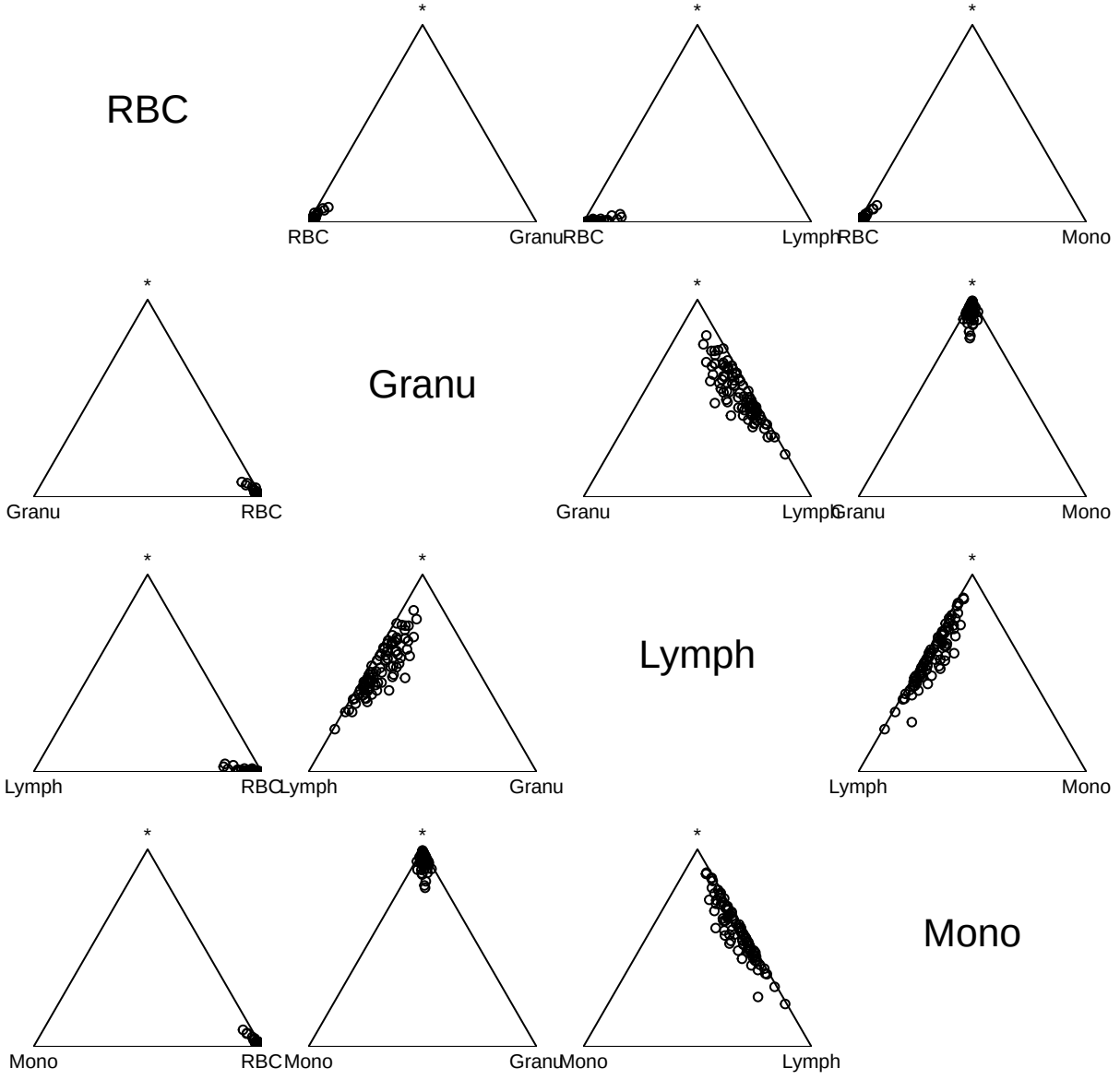

CLR−transformed Composition
RBC
Granu
Lymph
Mono
−3
−2
−1
0
2.0
3.0
4.0
1

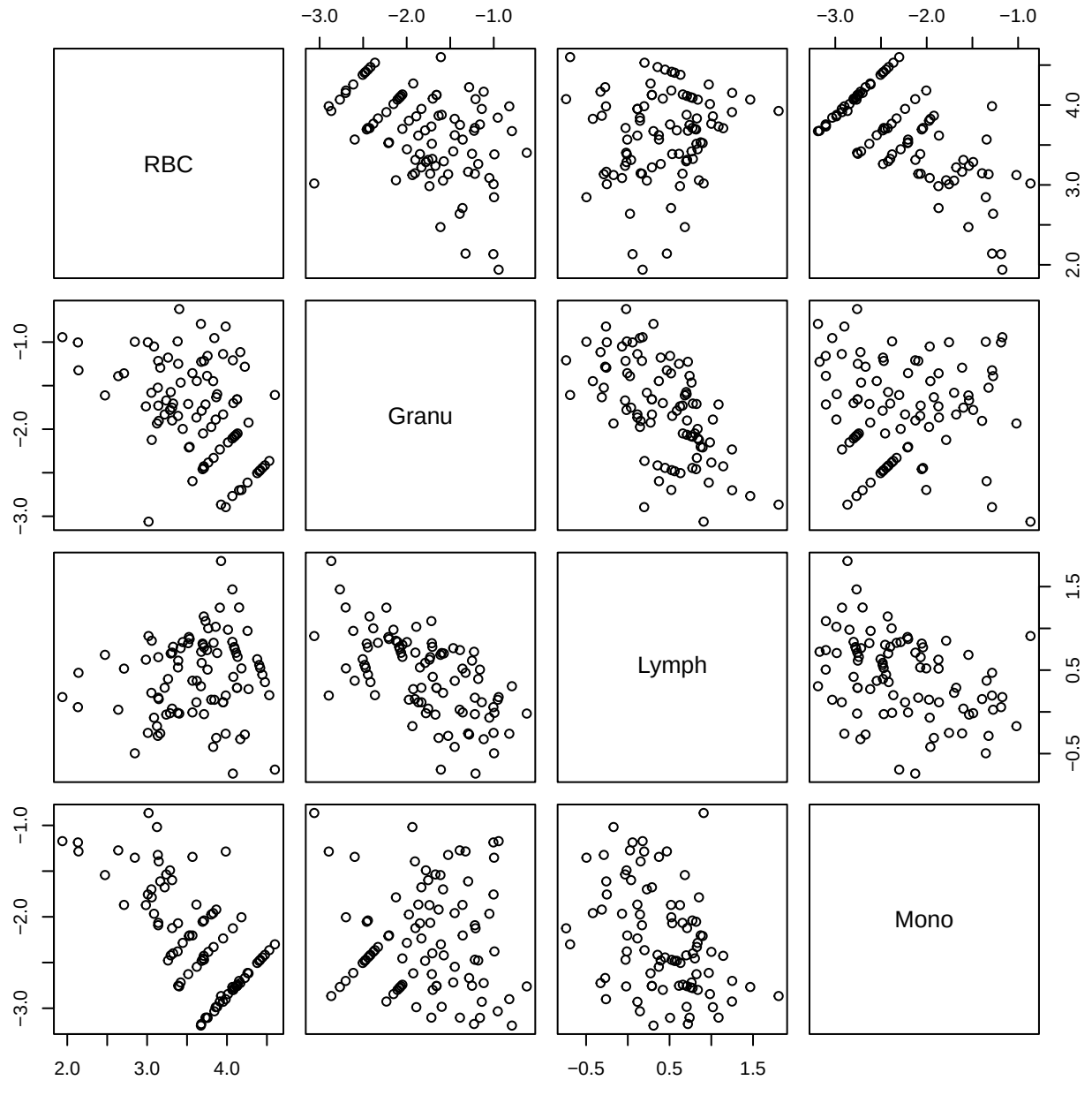

ILR−transformed Composition
−2
−1
0
1
−2
−3
−4
−5
1
0
−1
−2
0
−1
−2
−3
−4
−5
−4
−3
−2
−1
0

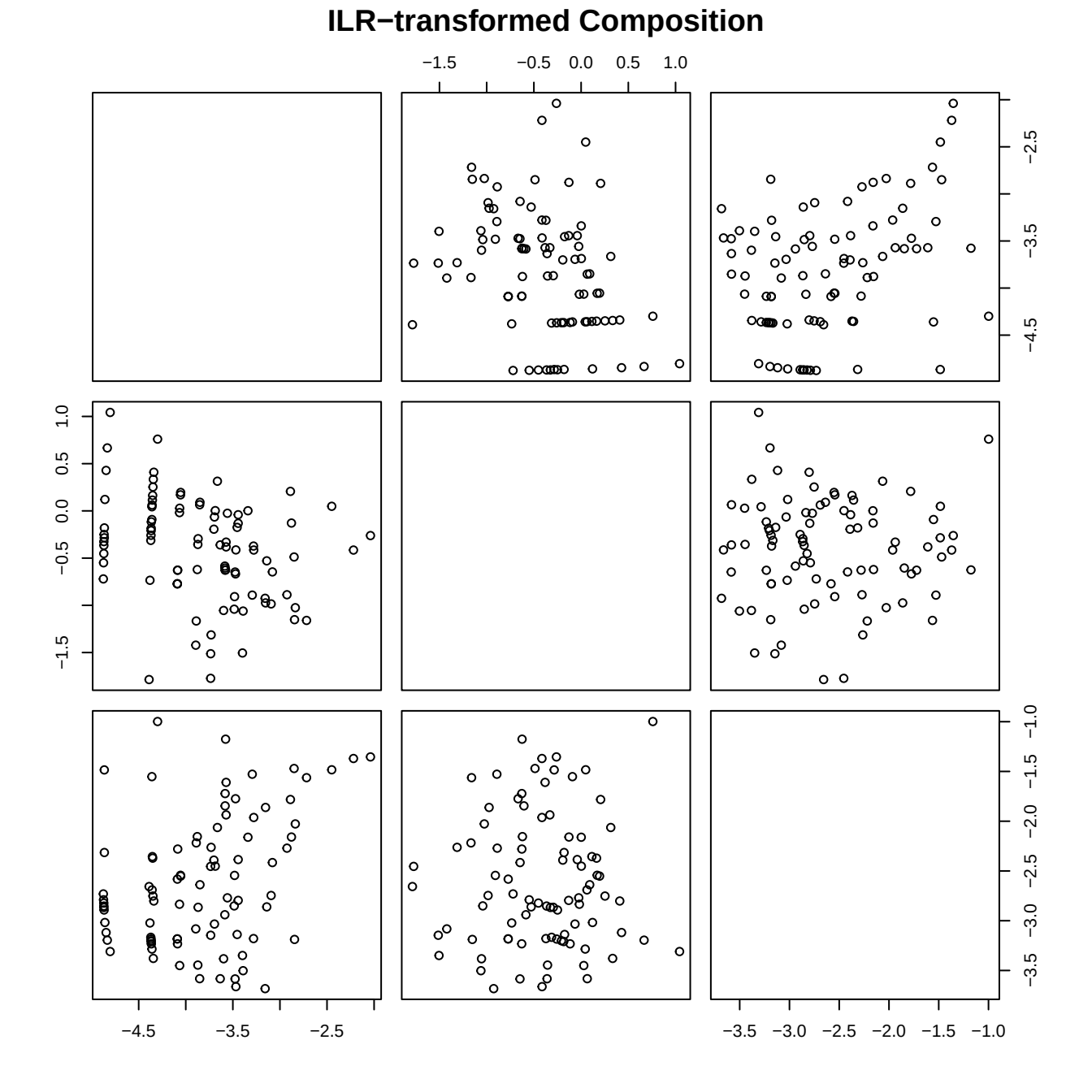
Composition after treating missing values

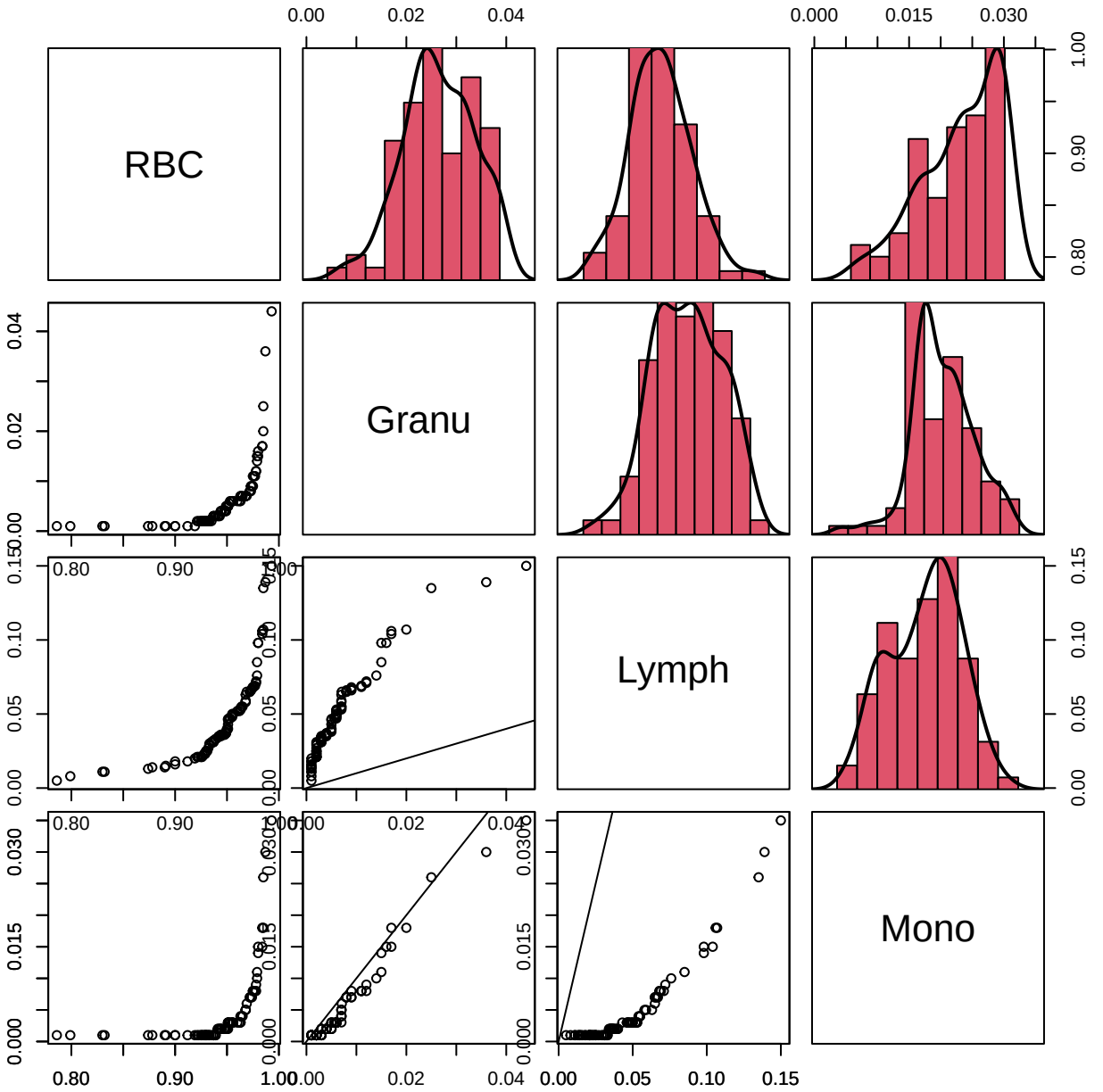
D21

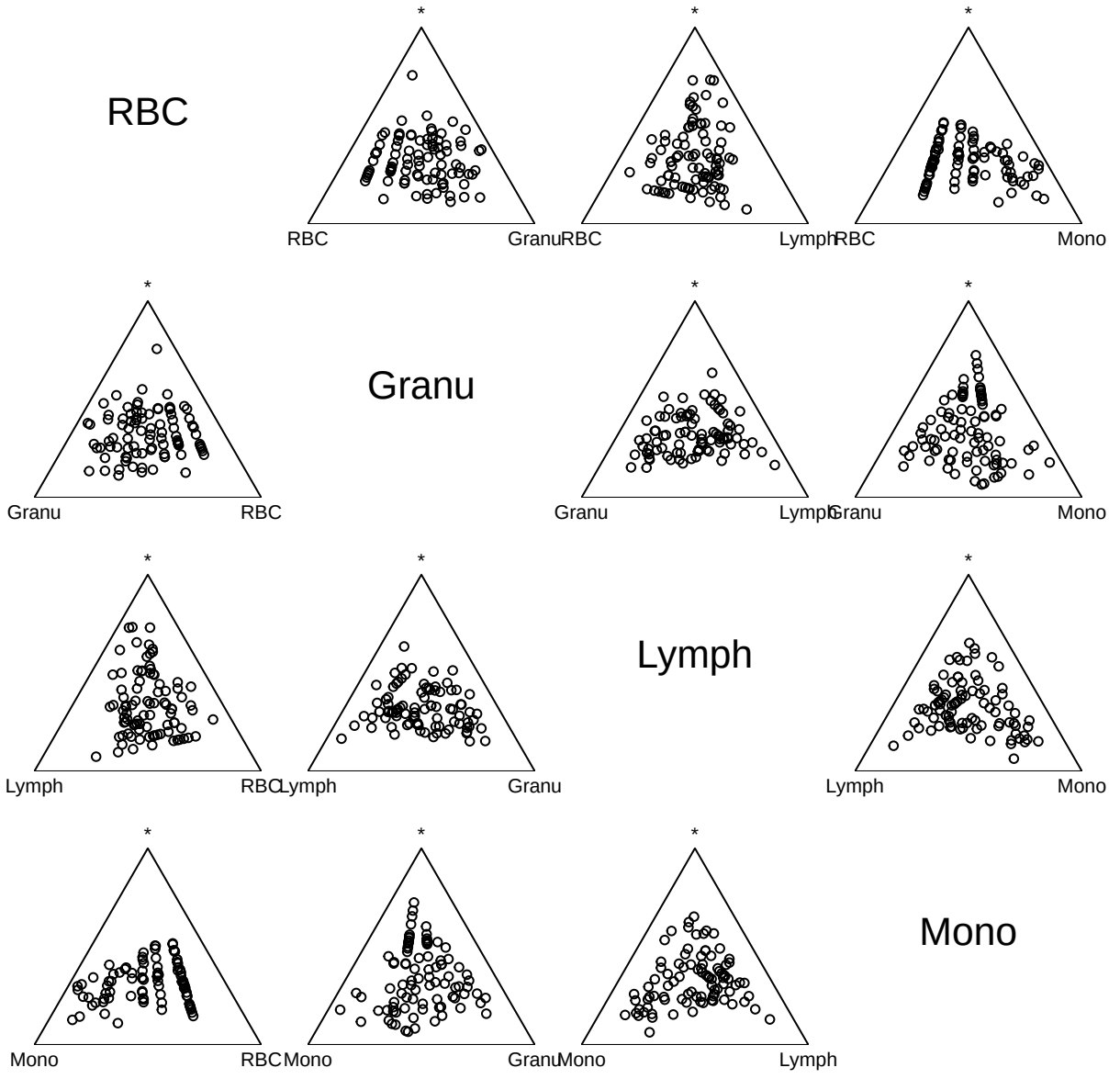
Untransformed Composition

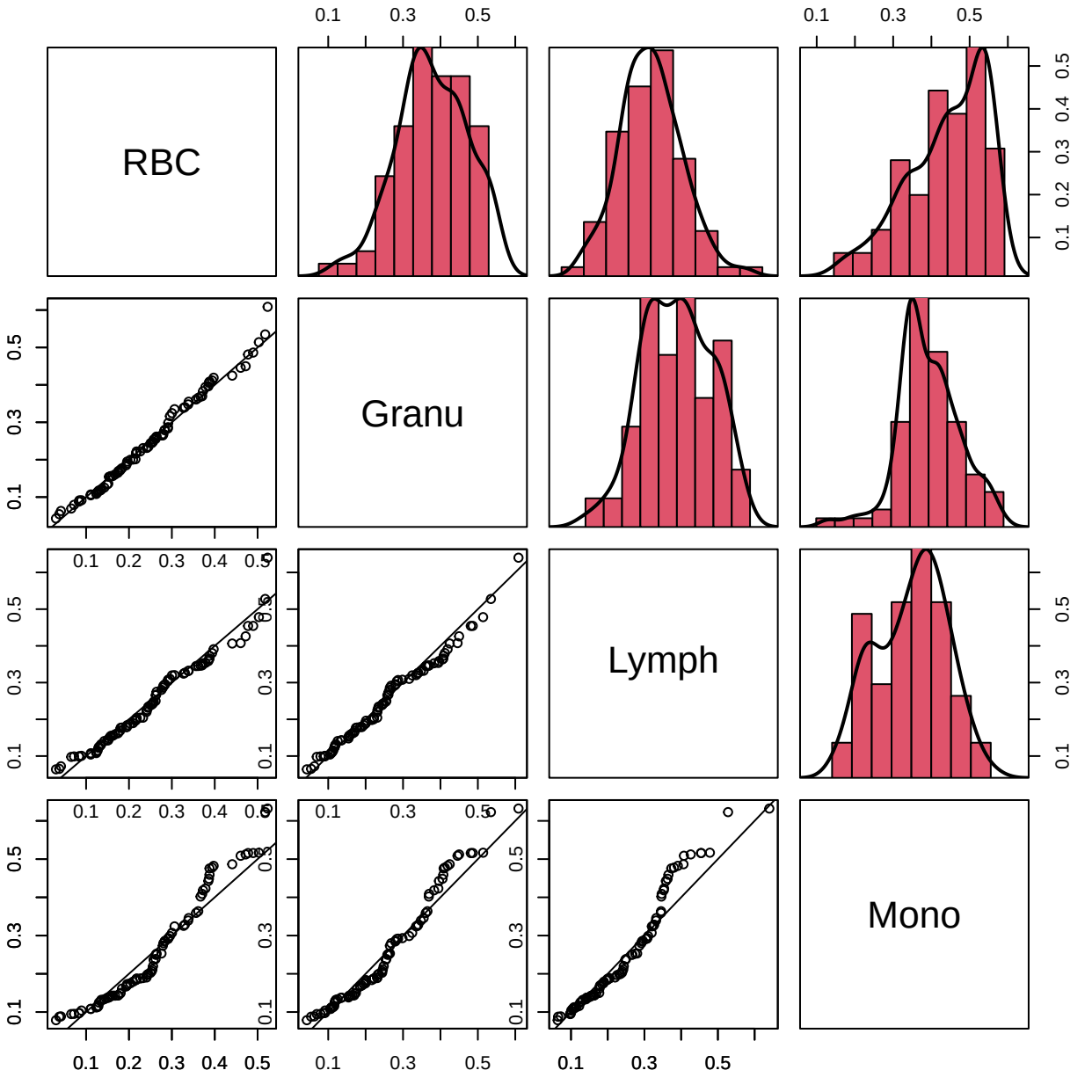



CLR−transformed Composition
RBC
Granu
Lymph
Mono
−3.0
−2.0
−1.0
2.0
3.0
4.0
−0.5
0.5
1.5


ILR−transformed Composition
−1.5
−0.5
0.0
0.5
1.0
−2.5
−3.5
−4.5
−1.5
−0.5
0.0
0.5
1.0
−4.5
−3.5
−2.5
−1.0
−1.5
−2.0
−2.5
−3.0
−3.5
−3.5
−3.0
−2.5
−2.0
−1.5
−1.0

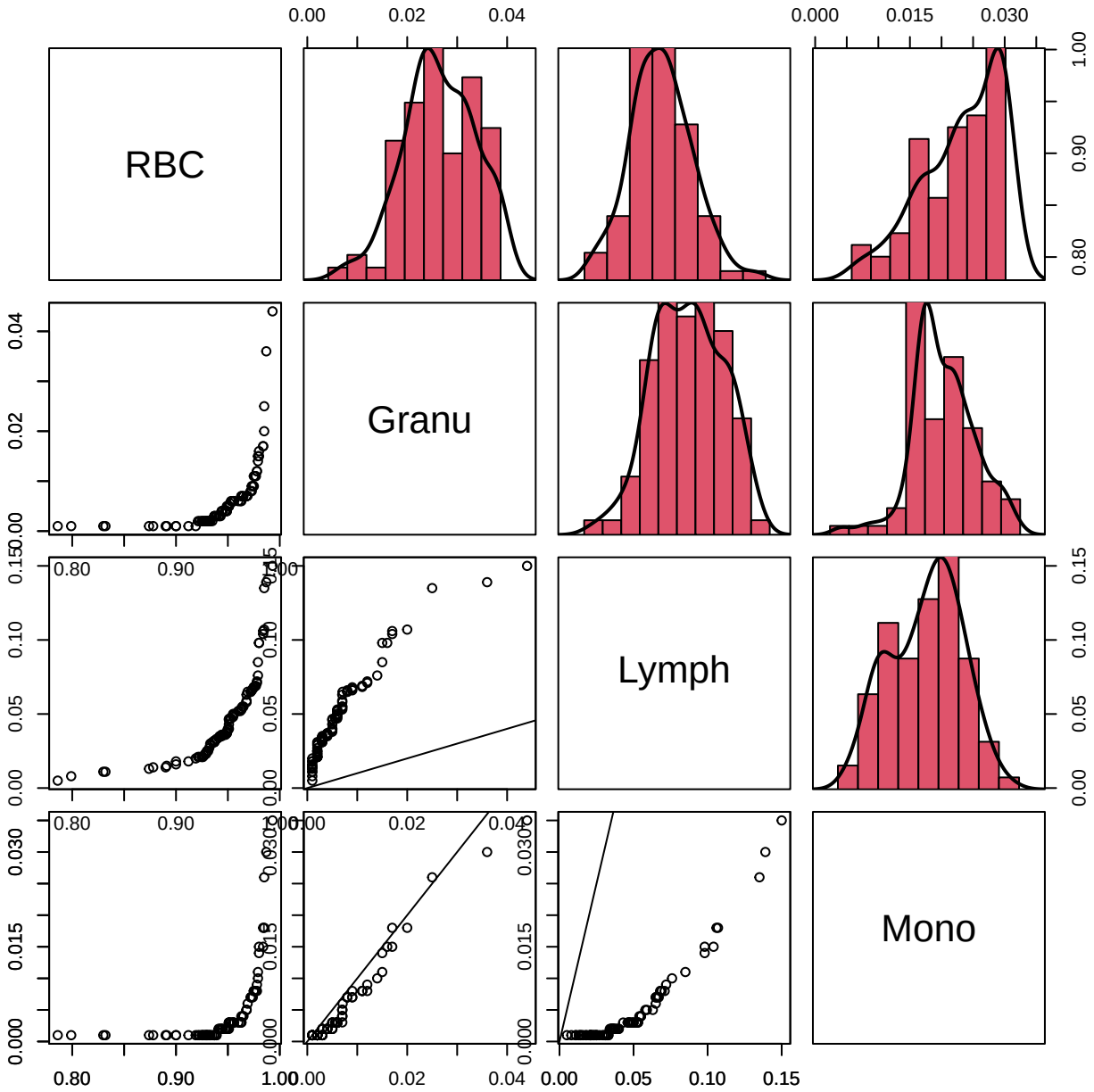

RBC
Granu
Lymph
Mono
0.00
0.02
0.04
0.000
0.015
0.030
0.80
0.90
1.00
0.05
0.10
0.15


RBC
Granu
Lymph
Mono
*
RBC
Granu
RBC
Lymph
RBC
Mono
Granu
RBC
Granu
Lymph
Granu
Mono
Lymph
RBC
Lymph
Granu
Lymph
Mono
Mono
RBC
Mono
Granu
Mono
Lymph

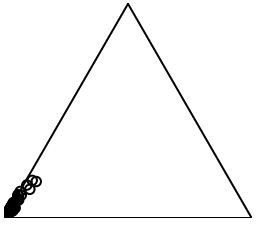

RBC
Granu
Lymph
Mono
0.1
0.2
0.3
0.4
0.5

Testing for normality and other assumptions

D21


Current Aitch. Composition
RBC
Granu
Lymph
Mono
0.00
0.02
0.04
0.000
0.015
0.030
0.80
0.90
1.00
0.05
0.10
0.15

Count Composition (ccomp)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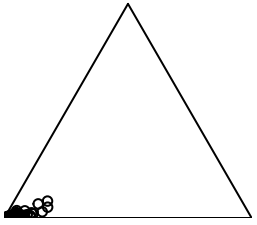
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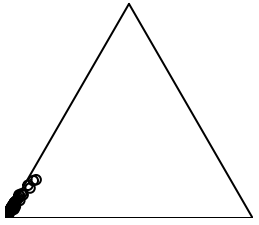
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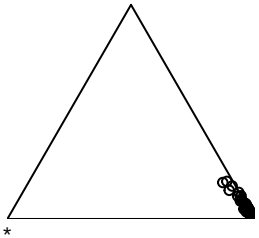
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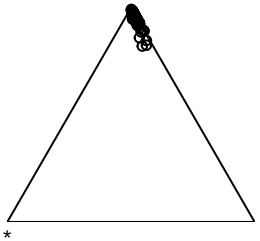
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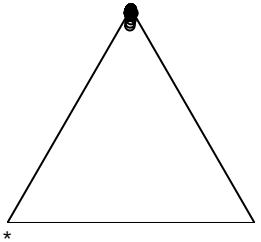
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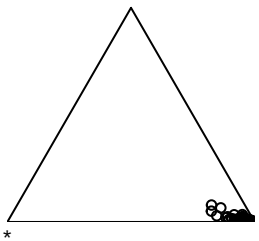
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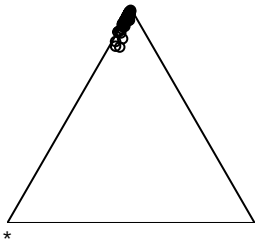
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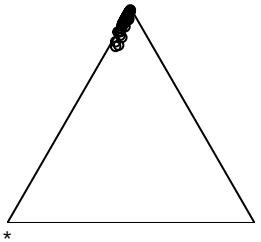
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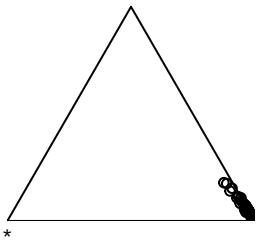
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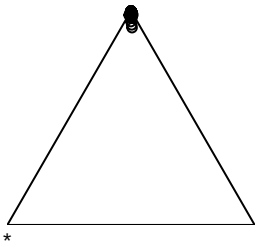
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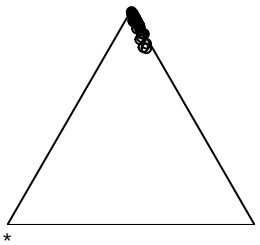
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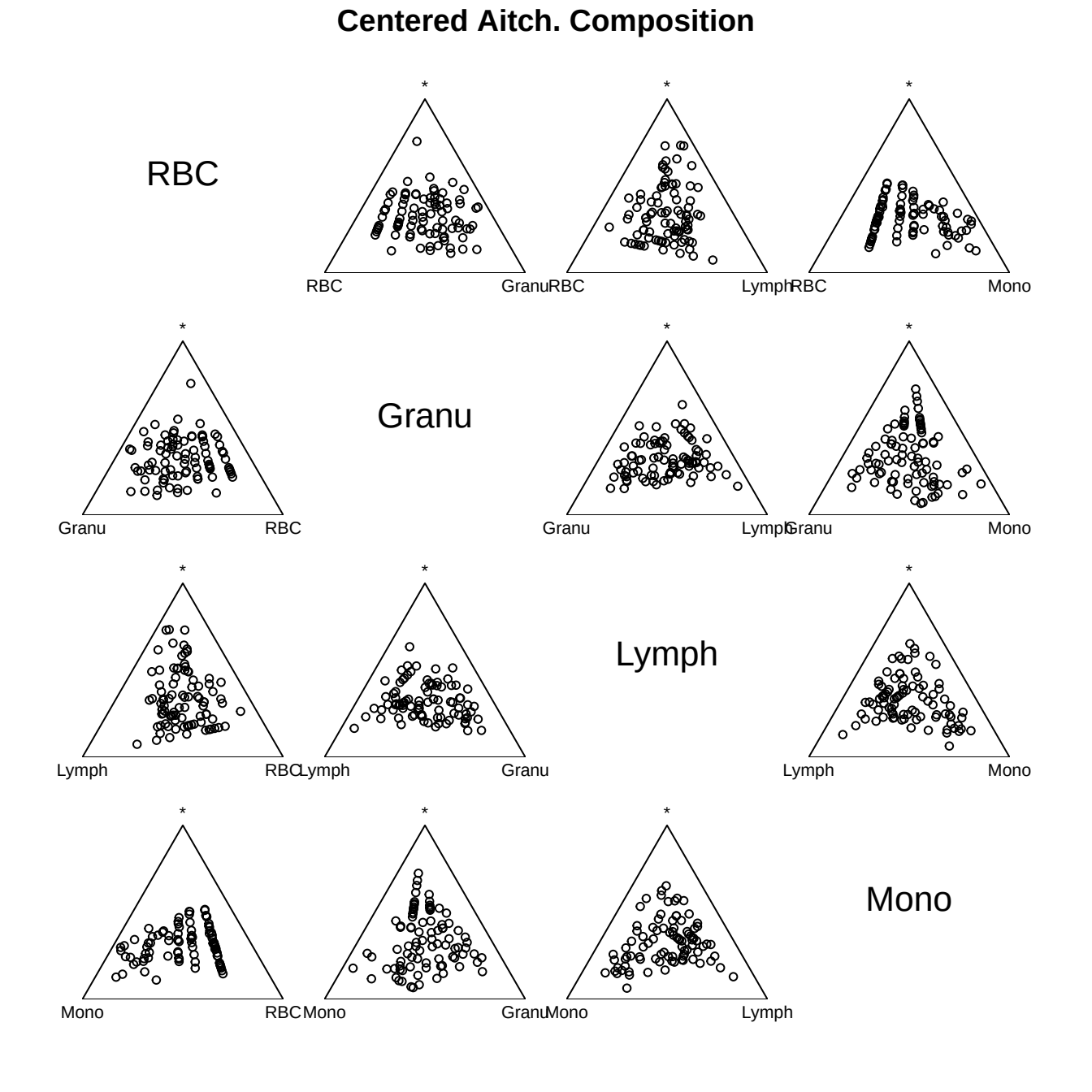
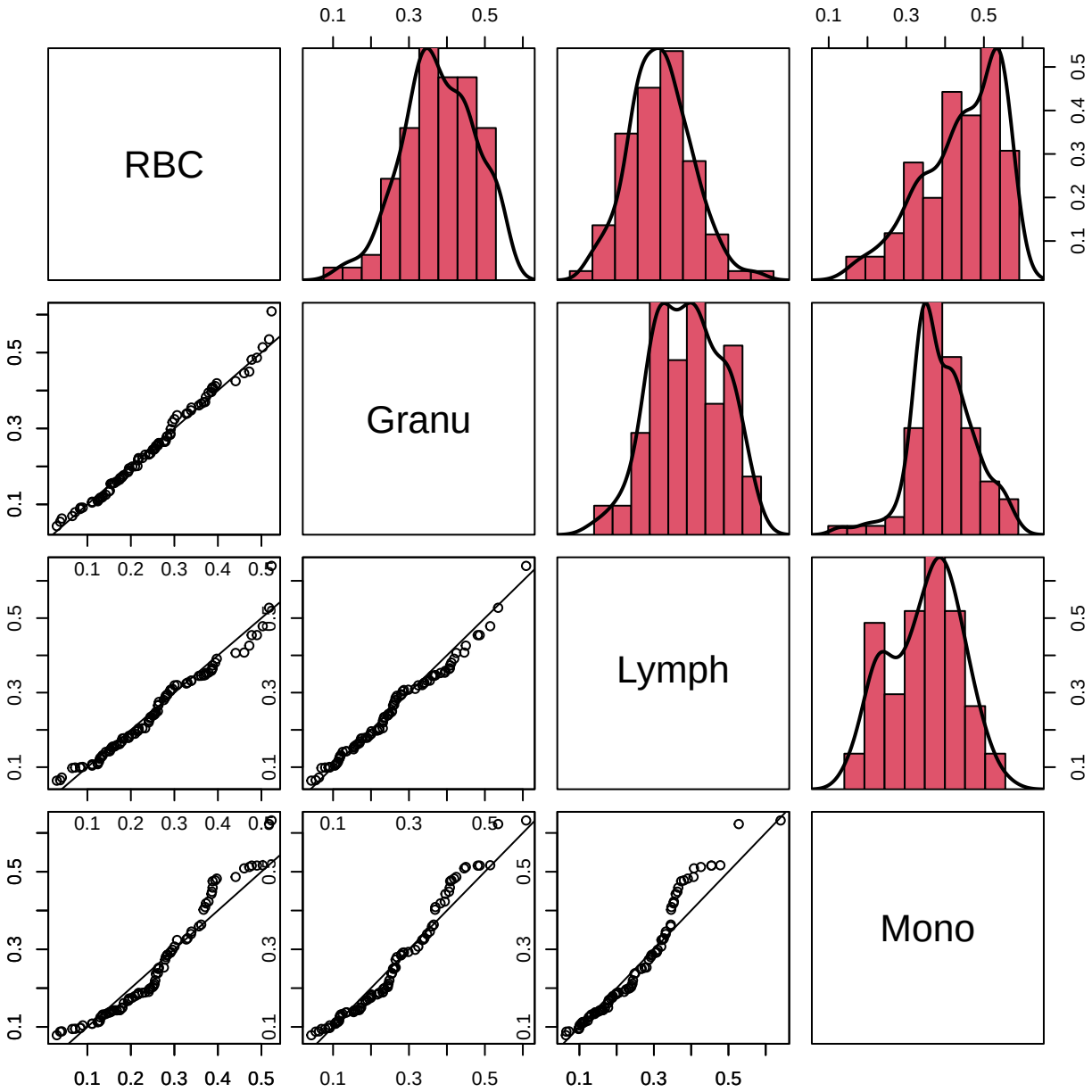
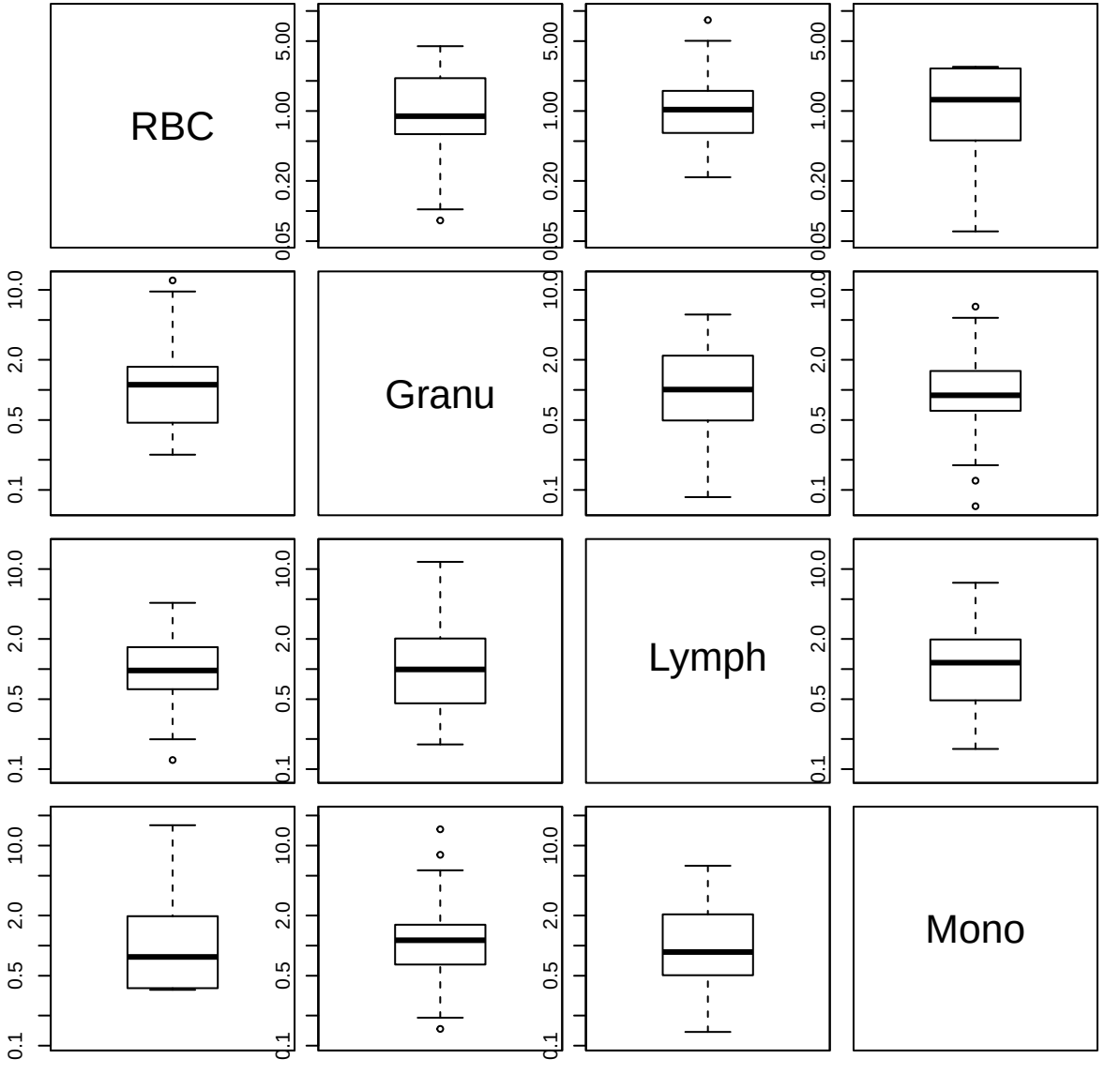

Centered Aitch. Composition
RBC
Granu
Lymph
Mono
RBC
Granu
RBC
Lymph
RBC
Mono
Granu
RBC
Granu
Lymph
Granu
Mono
Lymph
RBC
Lymph
Granu
Lymph
Mono
Mono
RBC
Mono
Granu
Mono
Lymph

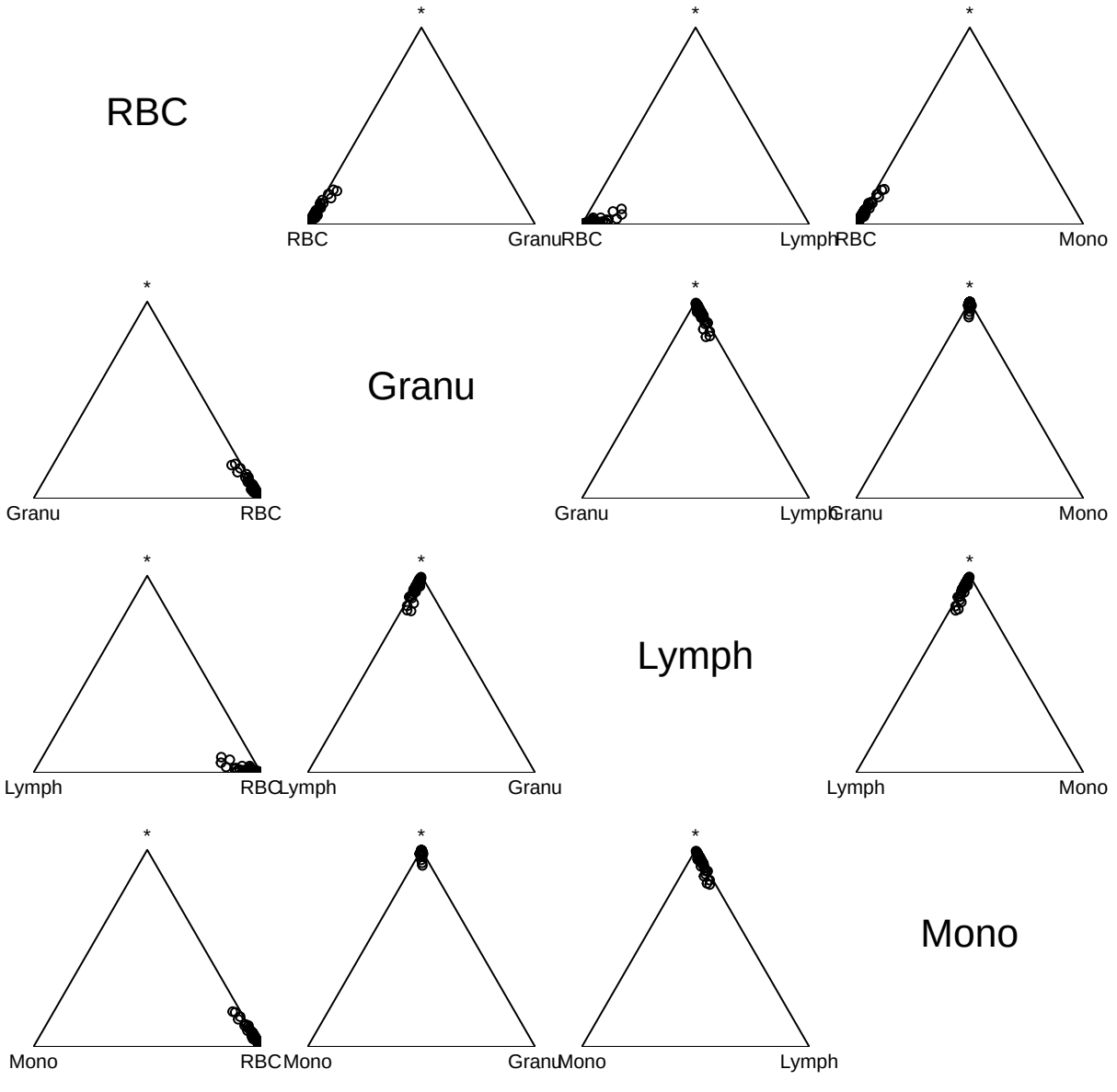

Centered Aitch. Composition
RBC
Granu
Lymph
Mono
0.1
0.2
0.3
0.4
0.5

Descriptive Stats

D21

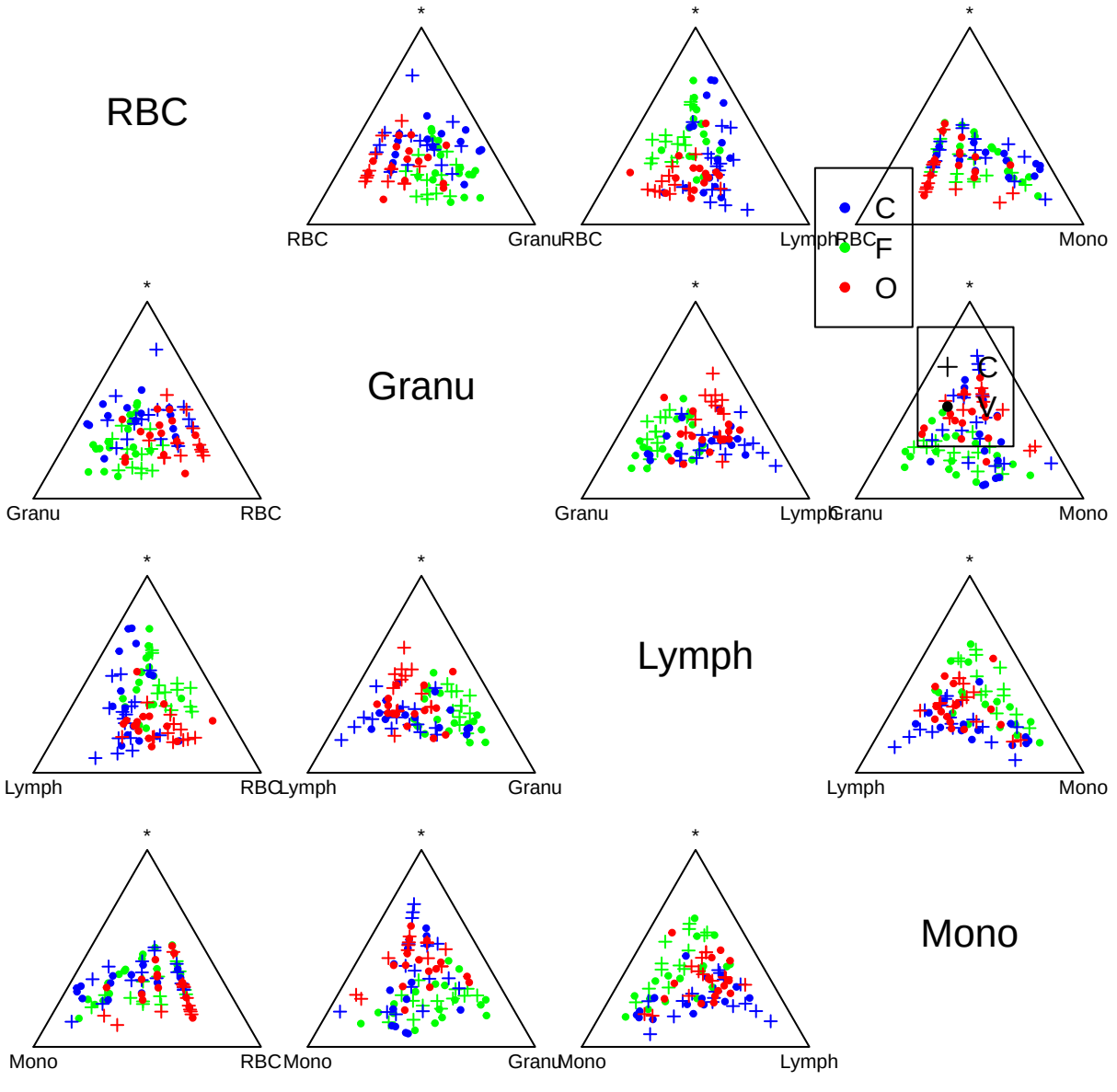

Boxplot of pairwise ration
RBC
Granu
Lymph
Mono
0.05
0.20
1.00
5.00
0.1
0.5
2.0
10.0

Boxplot of pairwise ration (not centered)

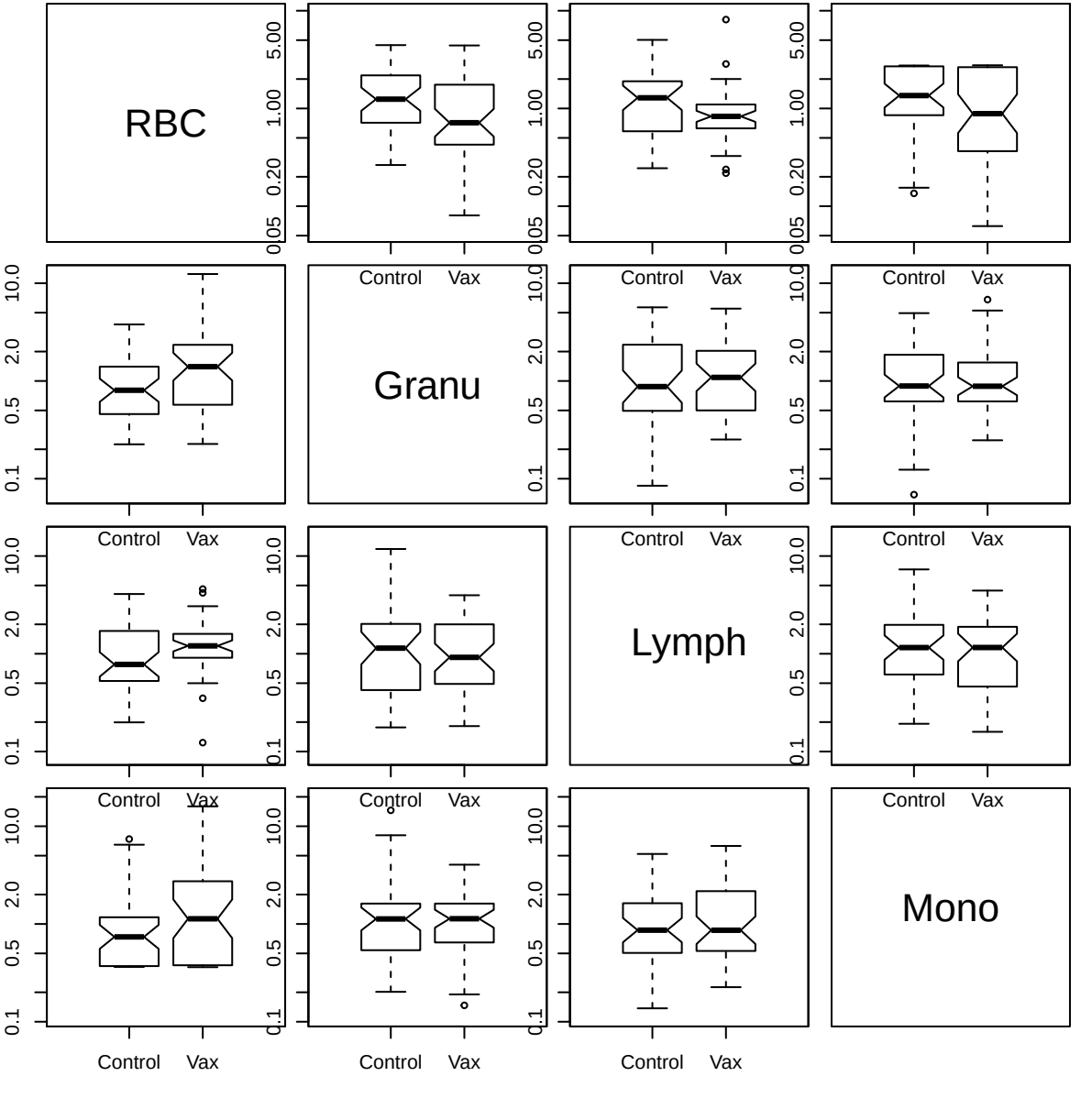


Univariate Approaches

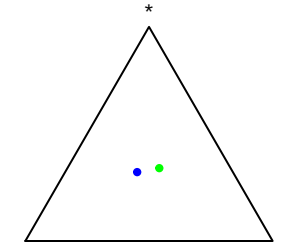
D21

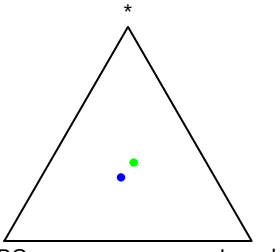

Composition by factor
RBC
Granu
Lymph
Mono
C
F
O
RBC
Granu
Lymph
Mono
Granu
RBC
Granu
Lymph
Granu
Mono
Lymph
RBC
Lymph
Granu
Lymph
Mono
Mono
RBC
Mono
Granu
Mono
Lymph

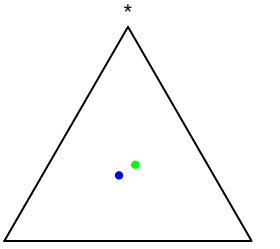
Composition against ...

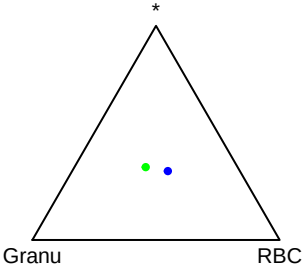


RBC

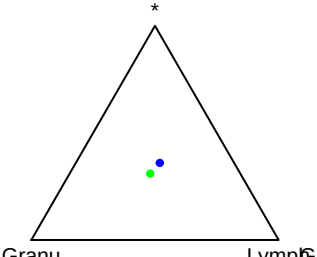


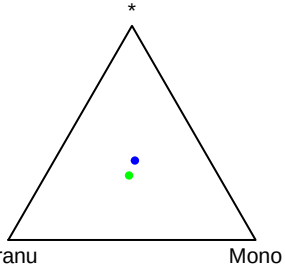


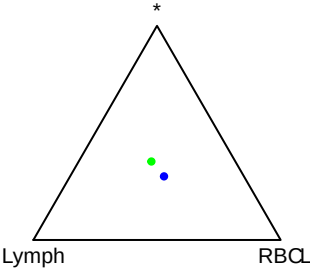


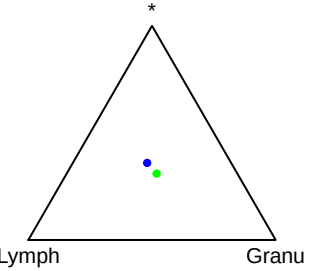


Granu

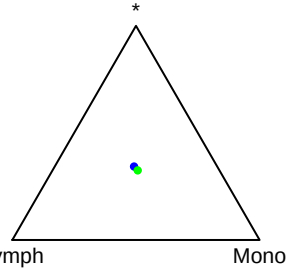


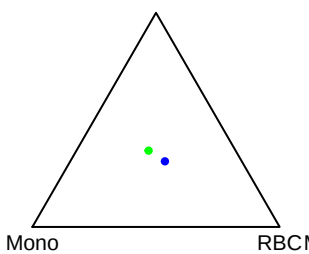


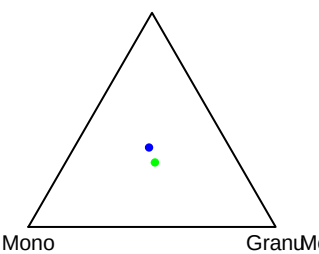


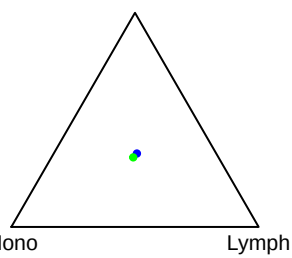


Lymph



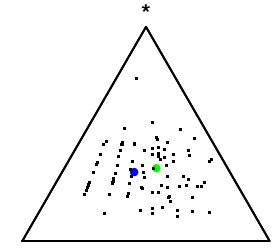


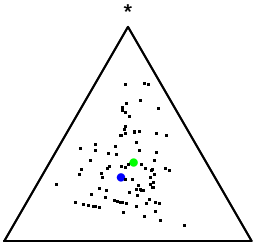


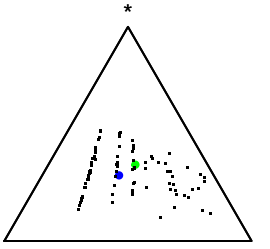


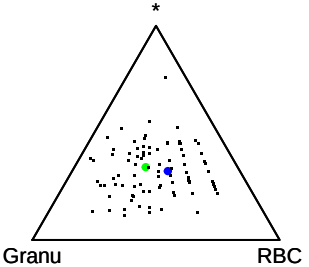
Mono

RBC

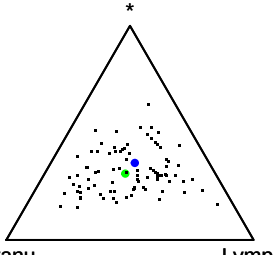


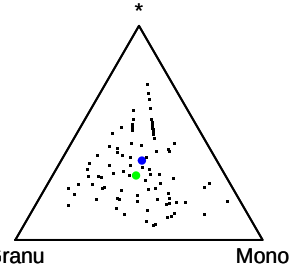


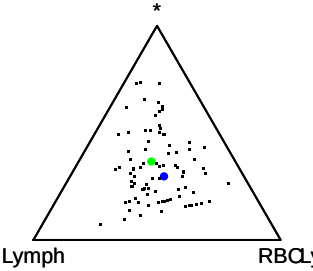


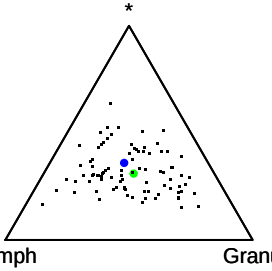


Granu

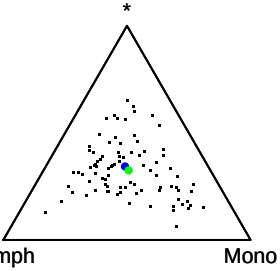


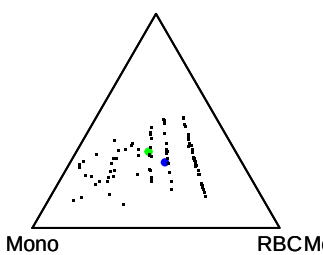


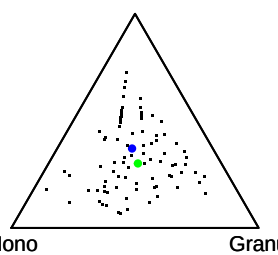


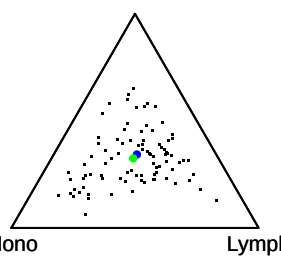


Lymph



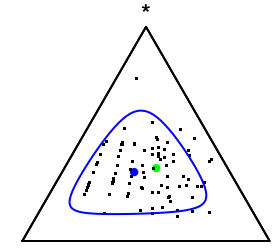


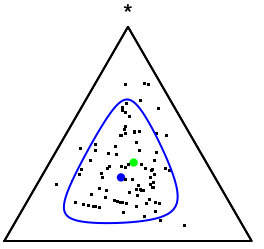


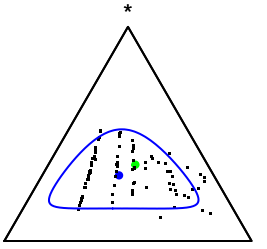


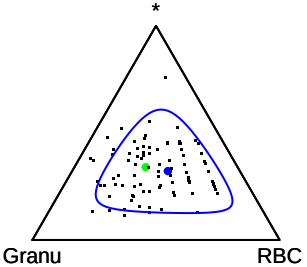
Mono

RBC

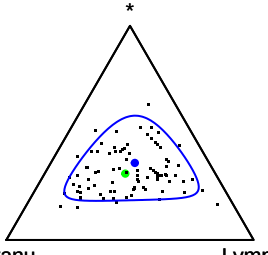


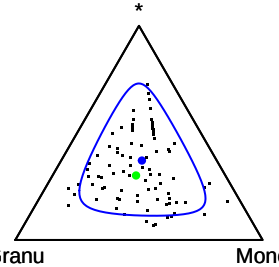


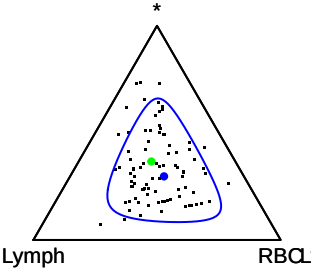


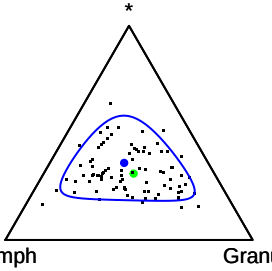


Granu

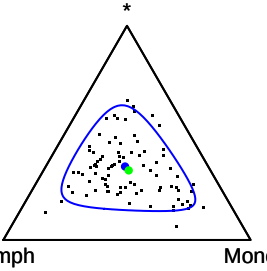


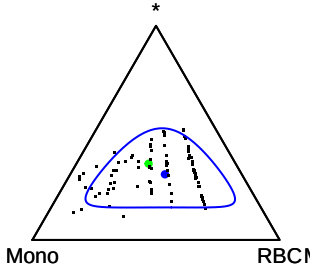


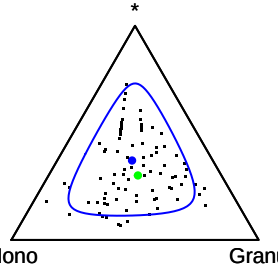


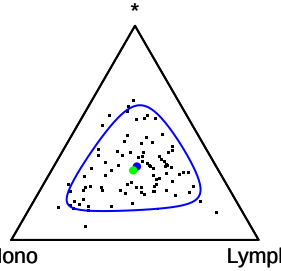


Lymph



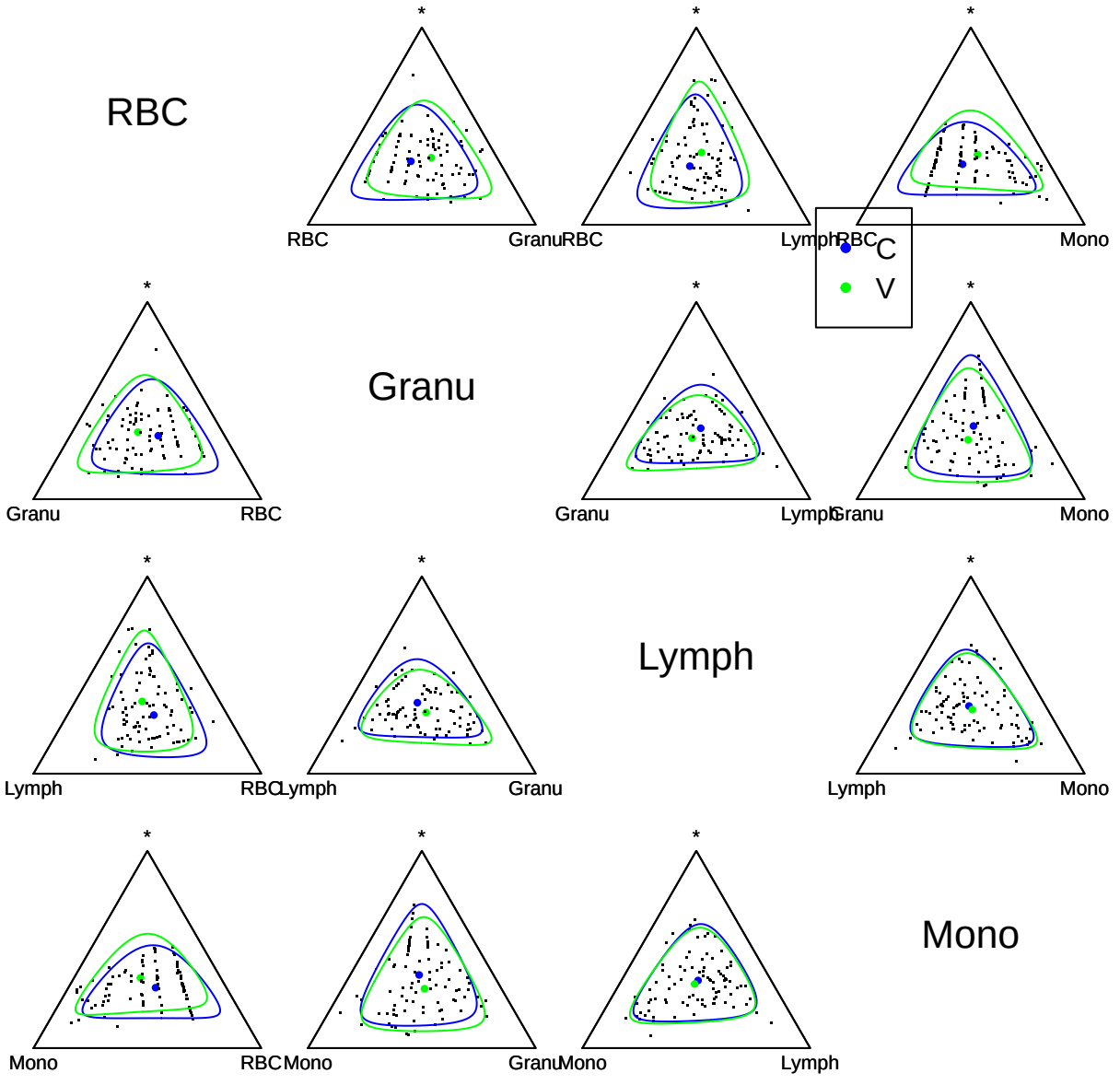


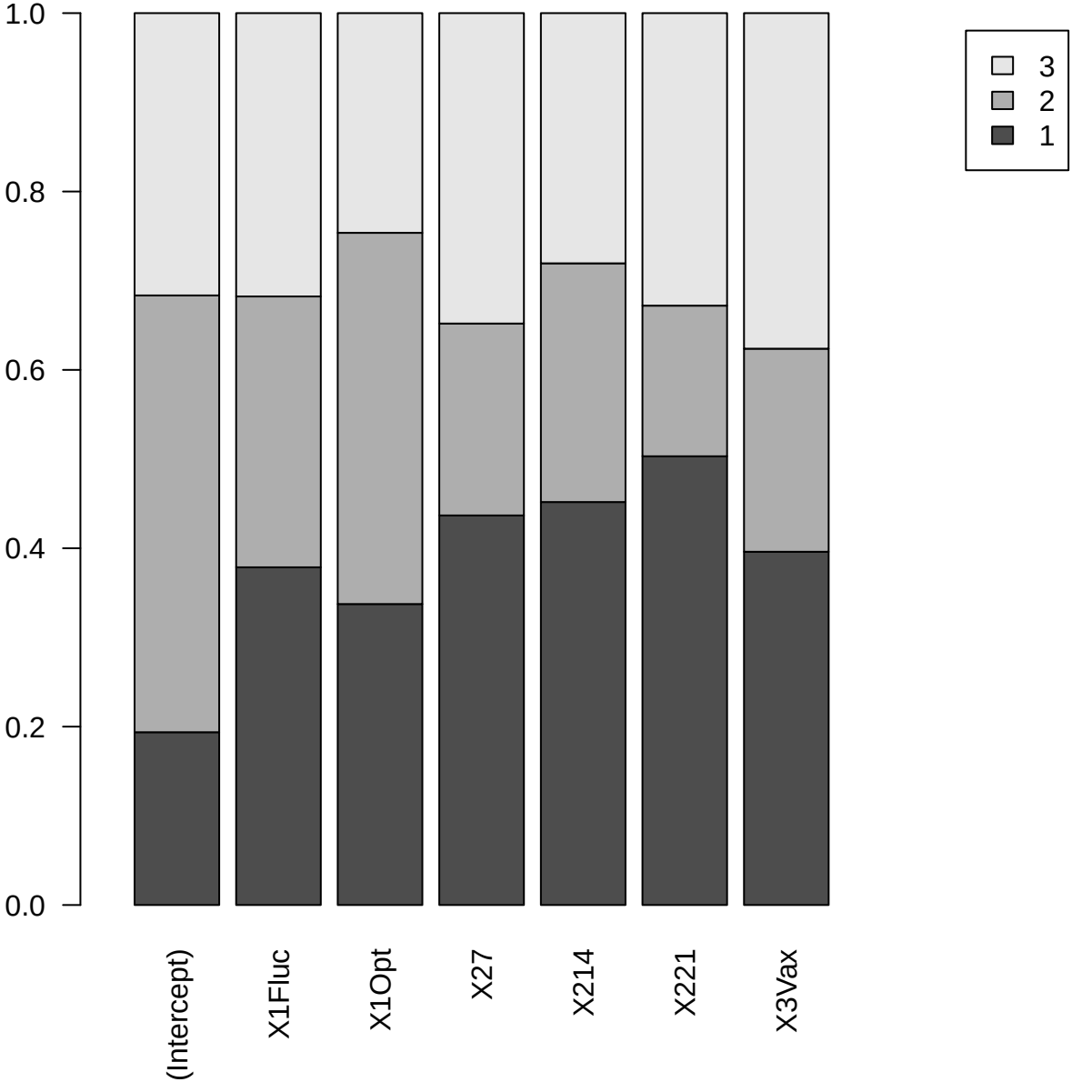


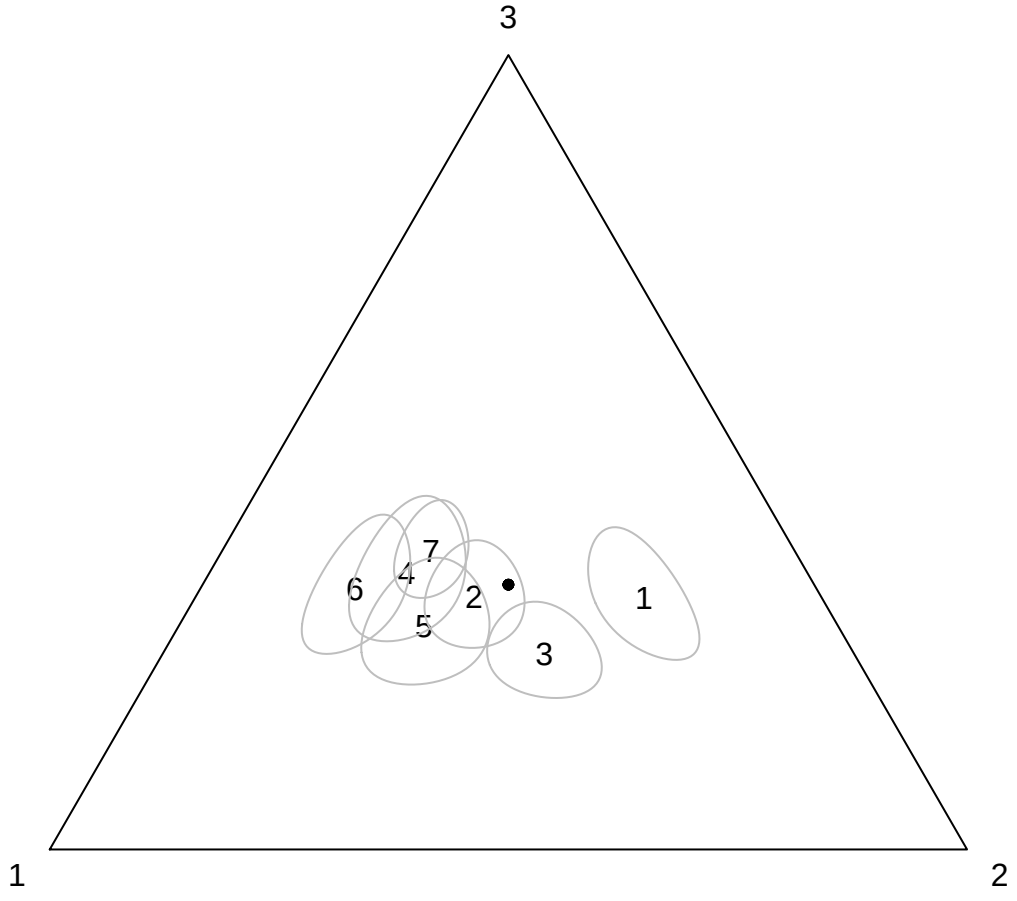


Mono

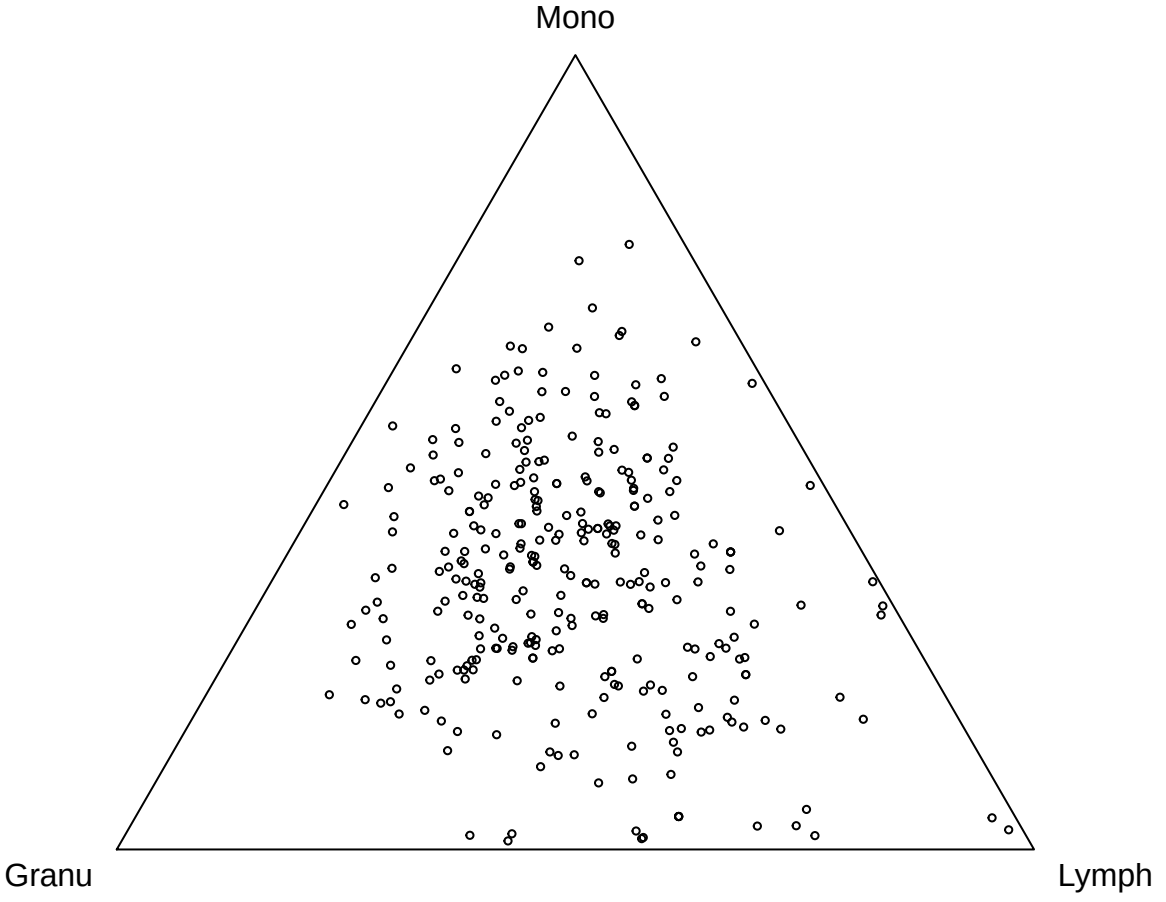
Means and Variances from ilr(Y)~X



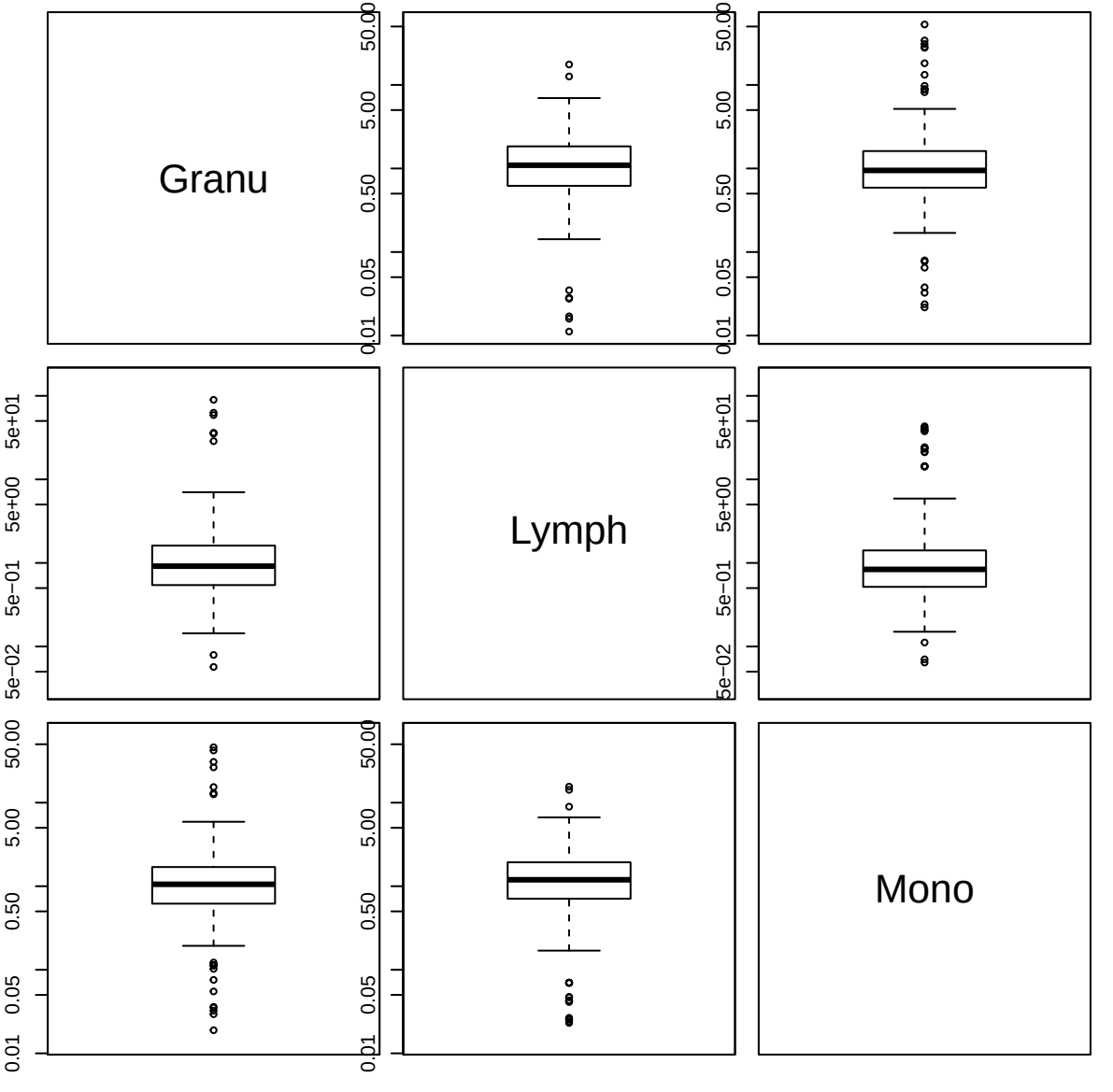

1.0
0.8
0.6
0.4
0.2
0.0
3
2
1
(Intercept)
X1Fluc
X1Opt
X27
X214
X221
X3Vax

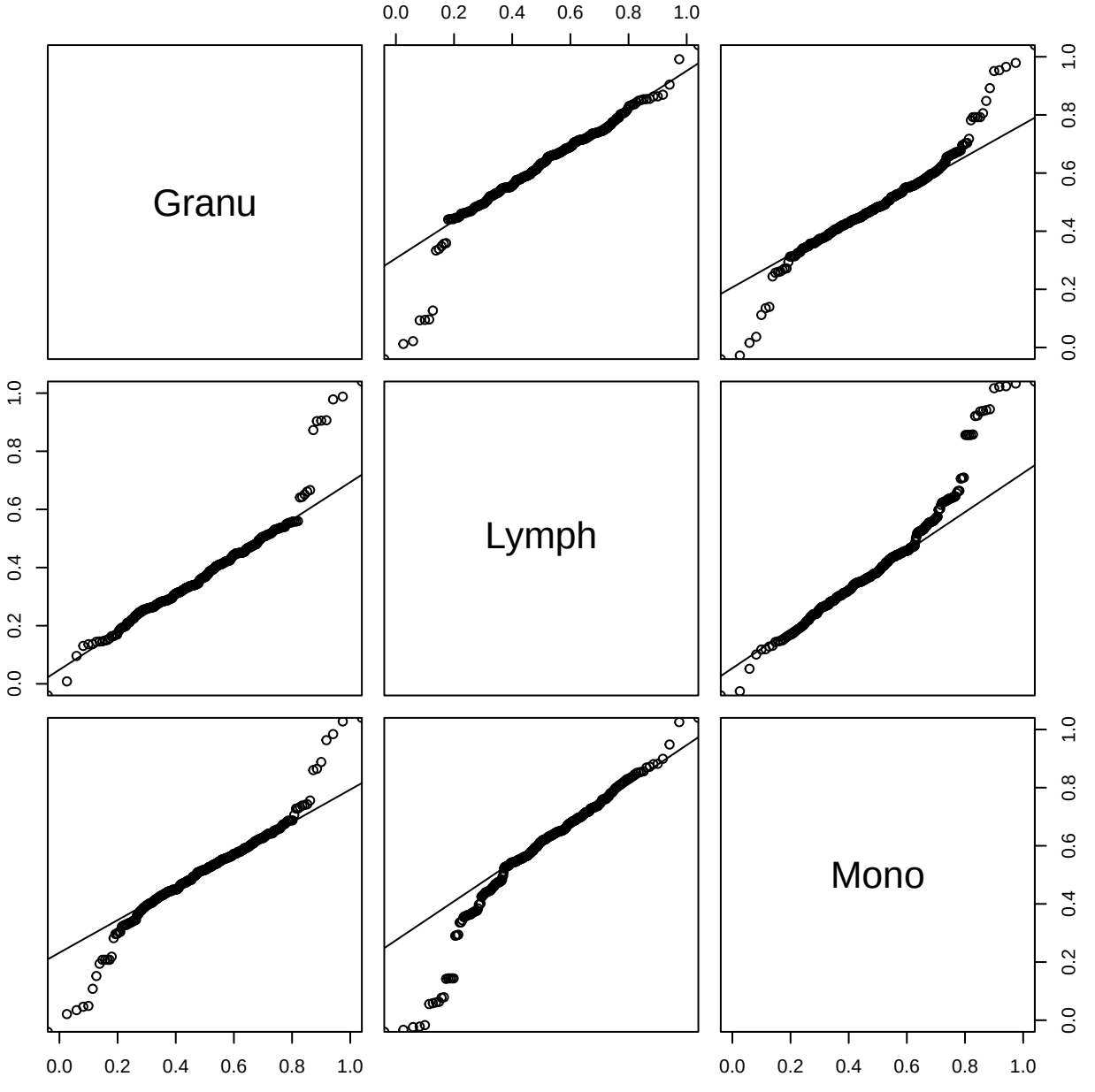

3
7
4
6
2
1
5
3
1
2

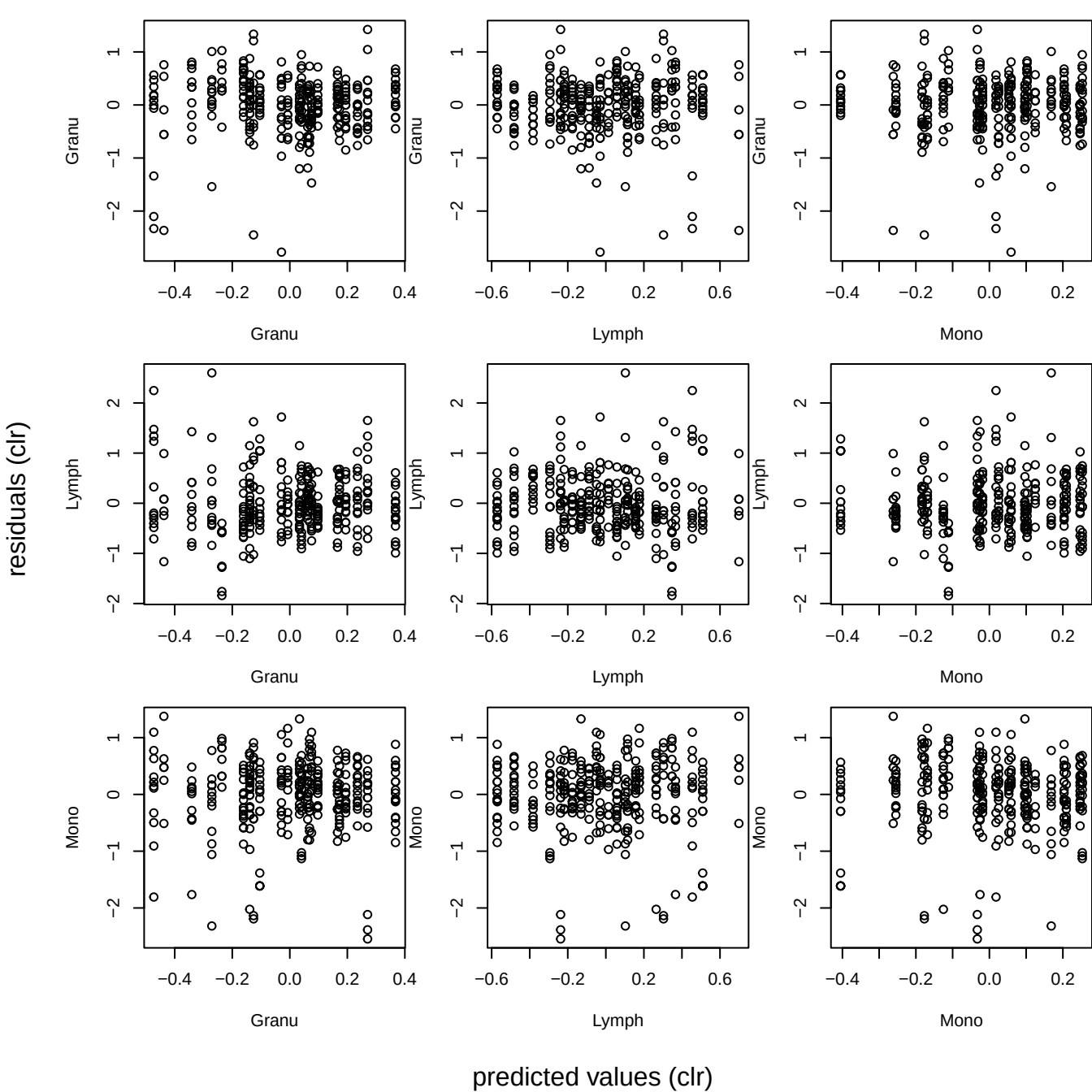
Ternary Diagrams of Residuals

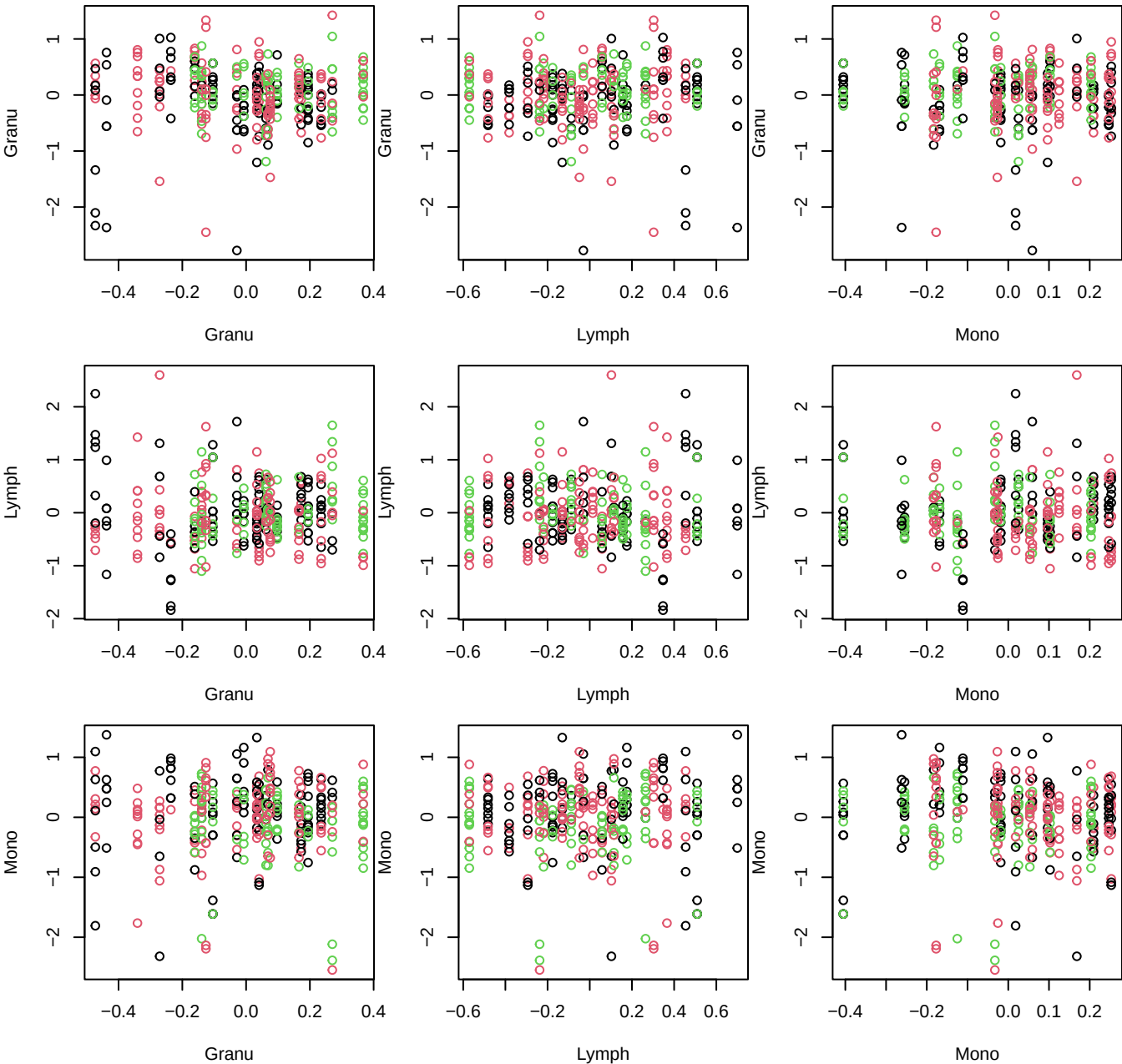


Boxplots of Residuals



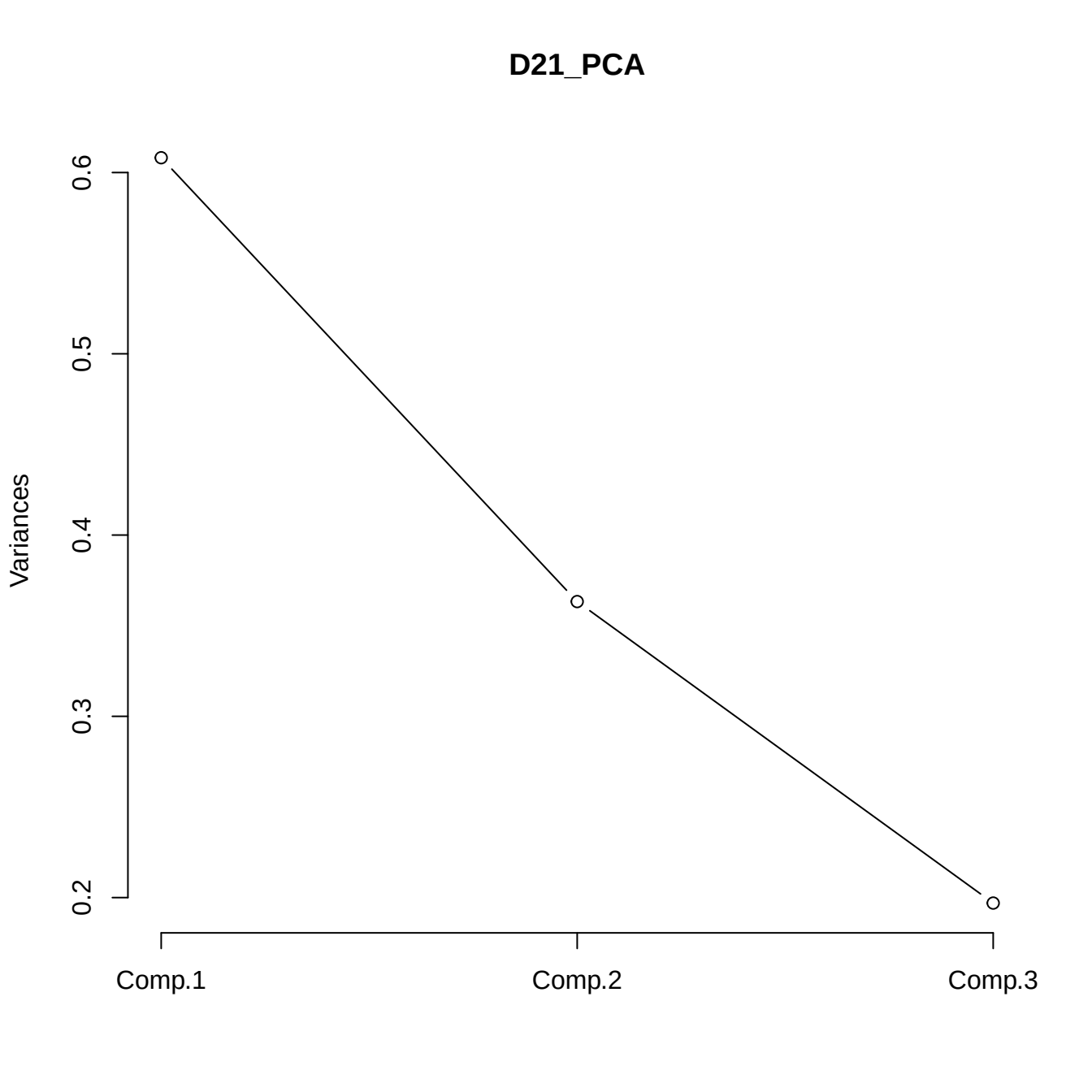

Granu
Lymph
Mono
0.0
0.2
0.4
0.6
0.8
1.0

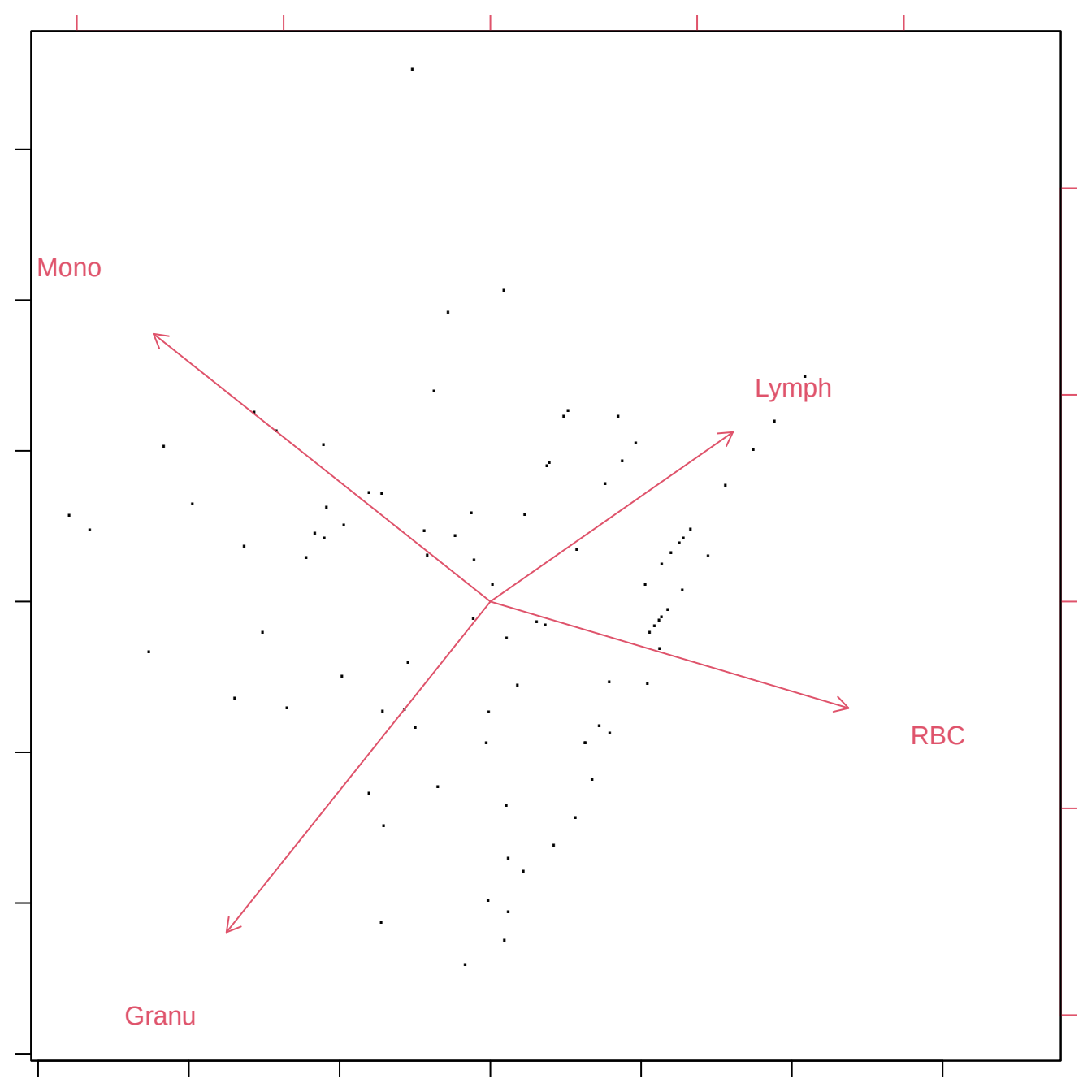

residuals (clr)
predicted values (clr)
Granu
Granu
Granu
Granu
Lymph
Mono
Lymph
Lymph
Lymph
Lymph
Mono
Mono
Mono
Mono
Mono
Mono
Granu
Lymph
Mono

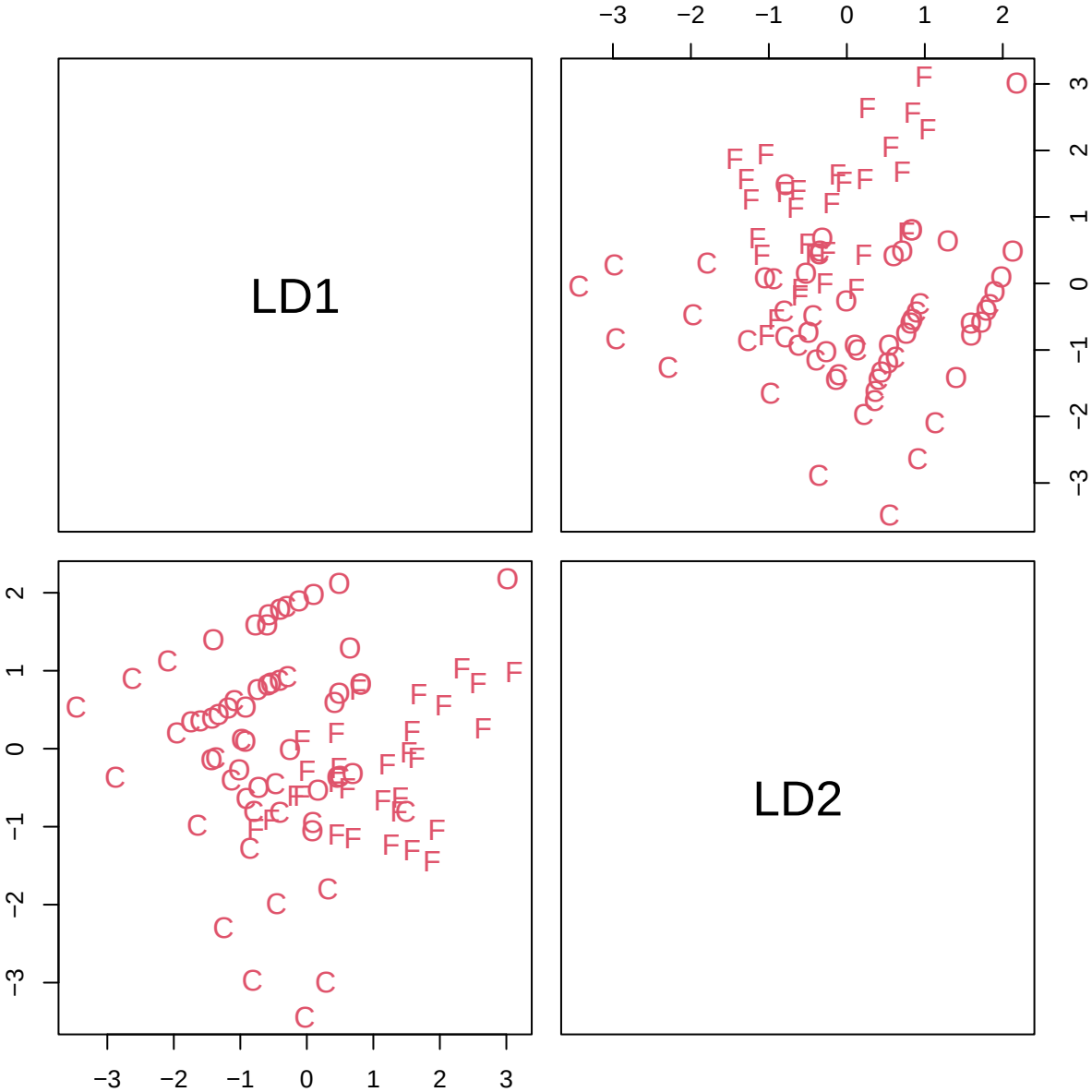

Granu
Granu
Lymph
Mono
Lymph
Granu
Lymph
Mono
Mono
Granu
Mono
Lymph
Mono

Multivariate Approaches (PCA and LDA)

D21


D21_PCA
Variances
0.2
0.3
0.4
0.5
0.6
Comp.1
Comp.2
Comp.3


Mono
Lymph
RBC
Granu


LD1
LD2
−3
−2
−1
0
1
2
3