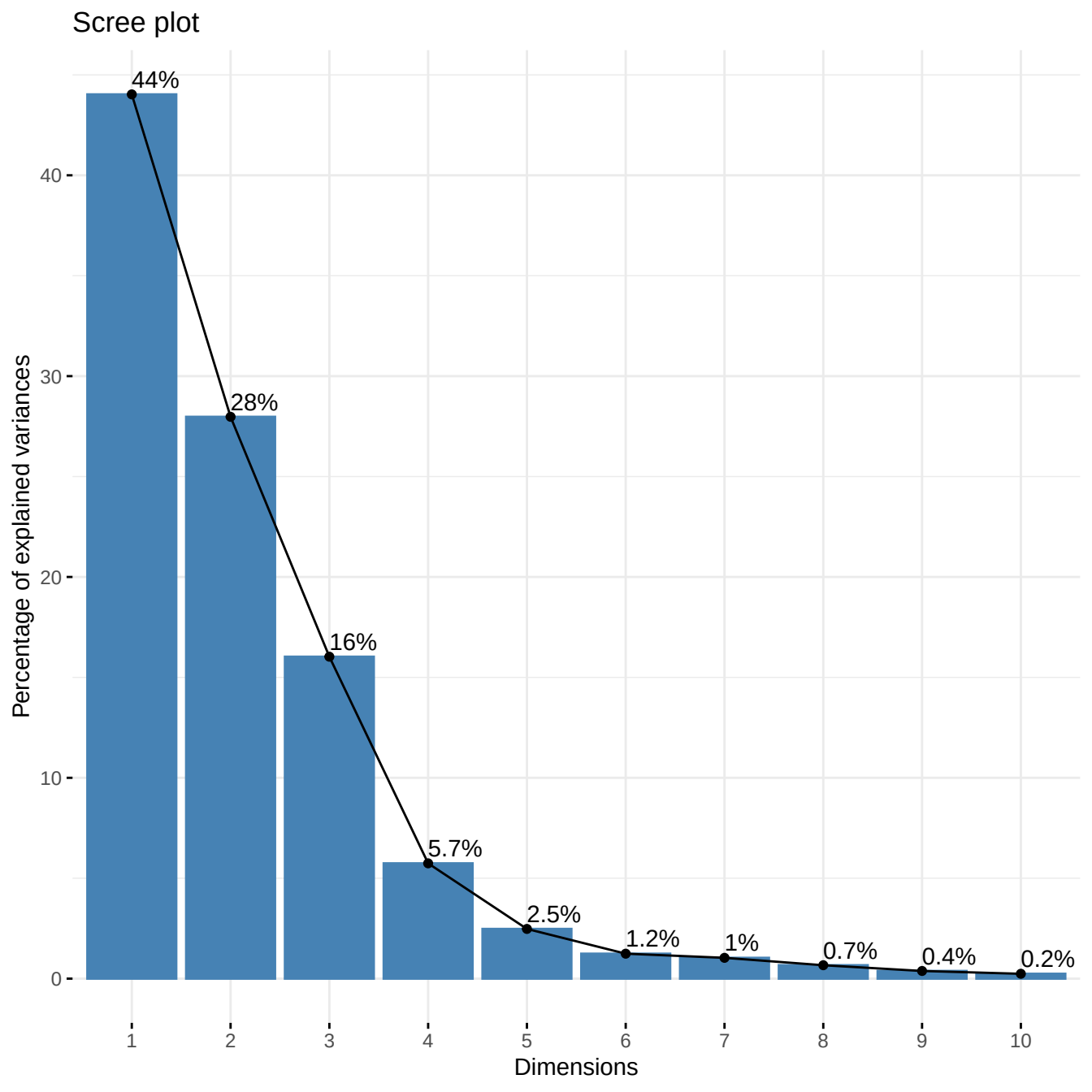
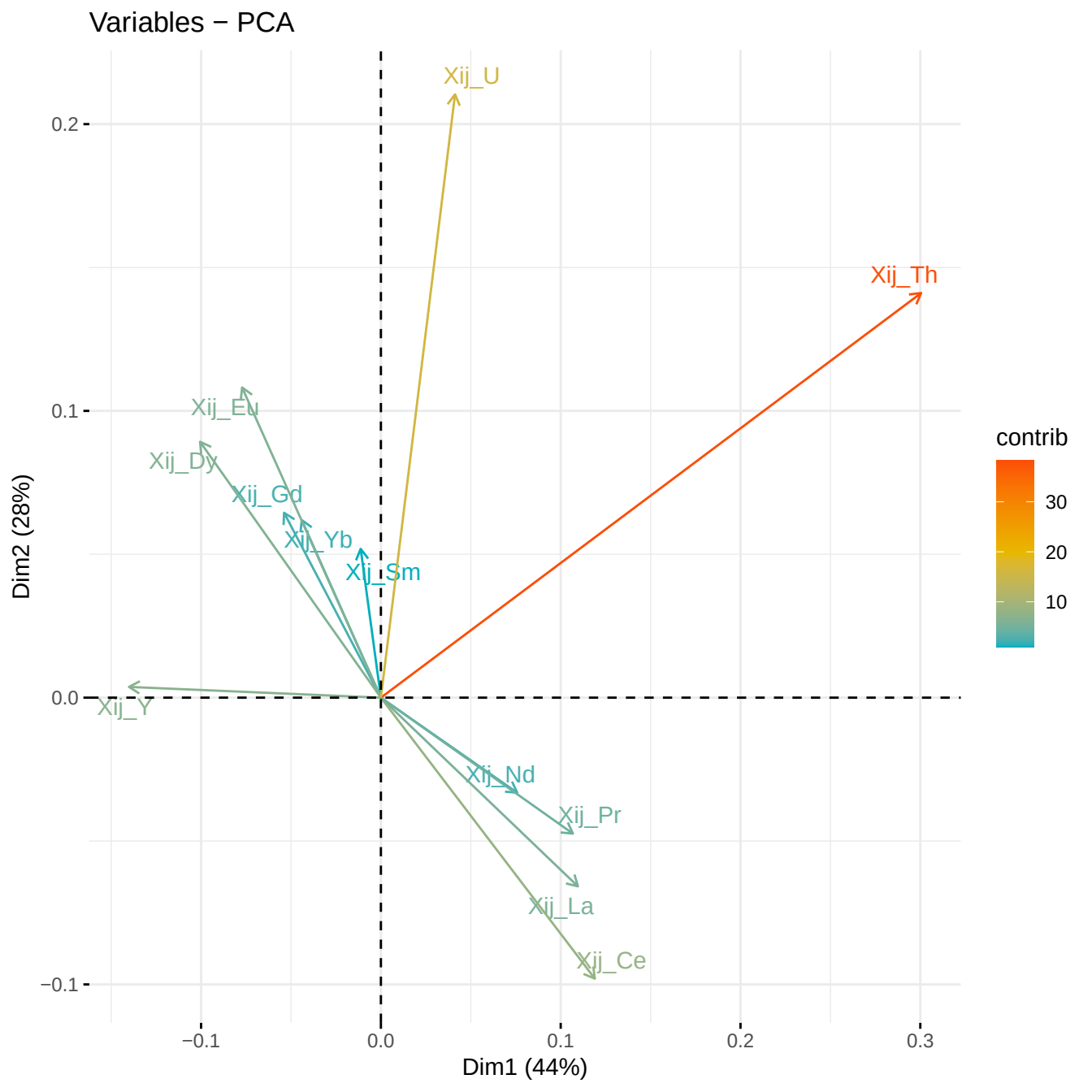
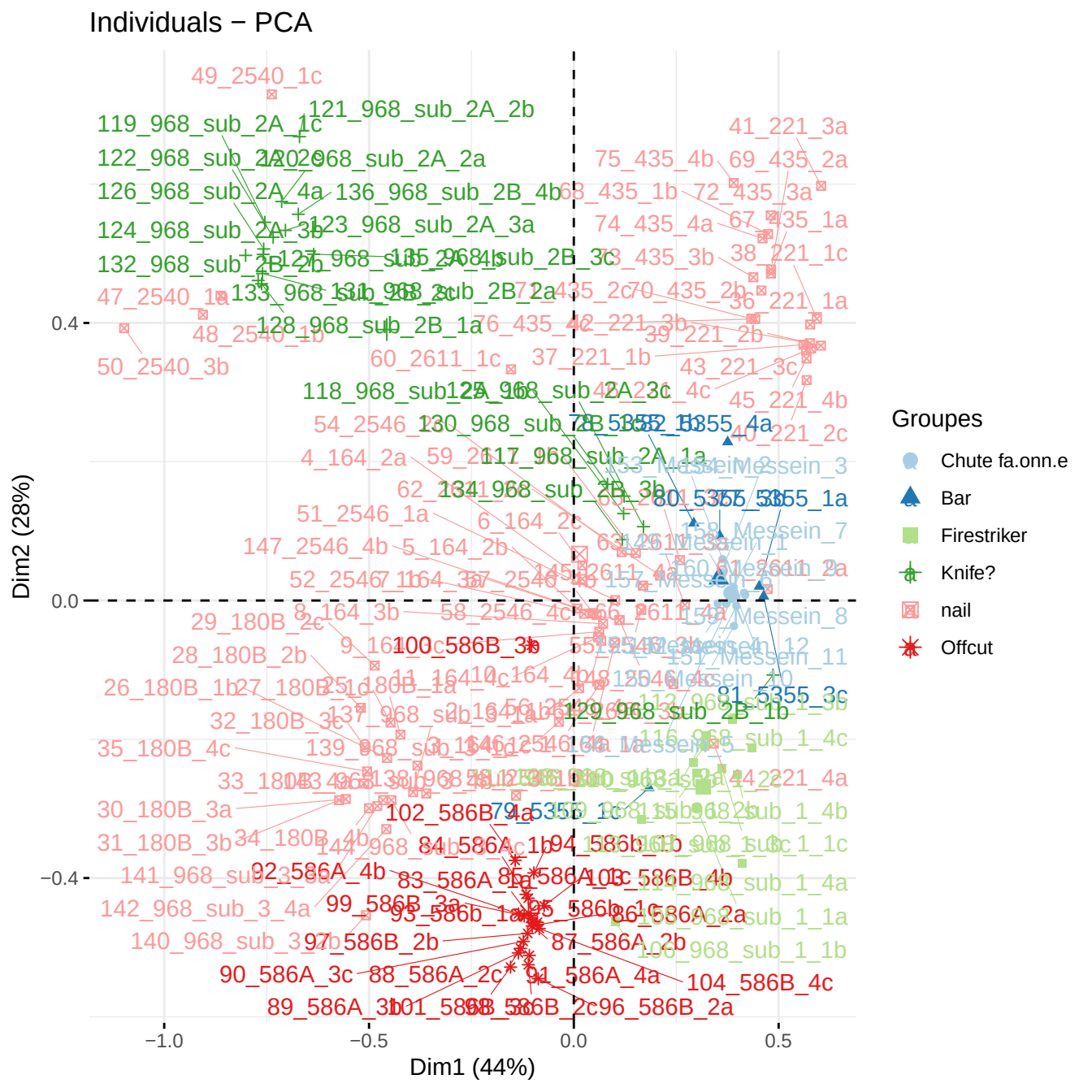
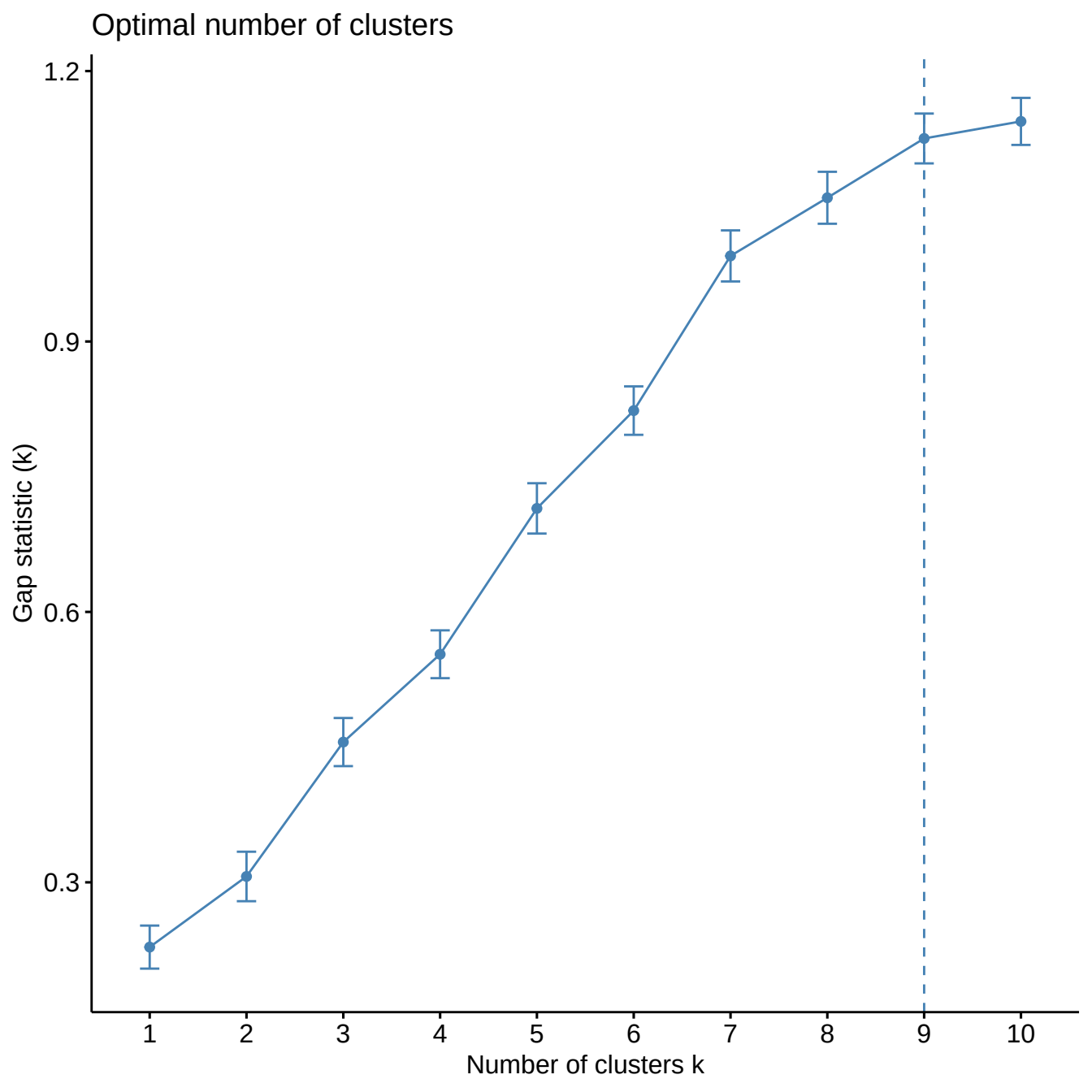
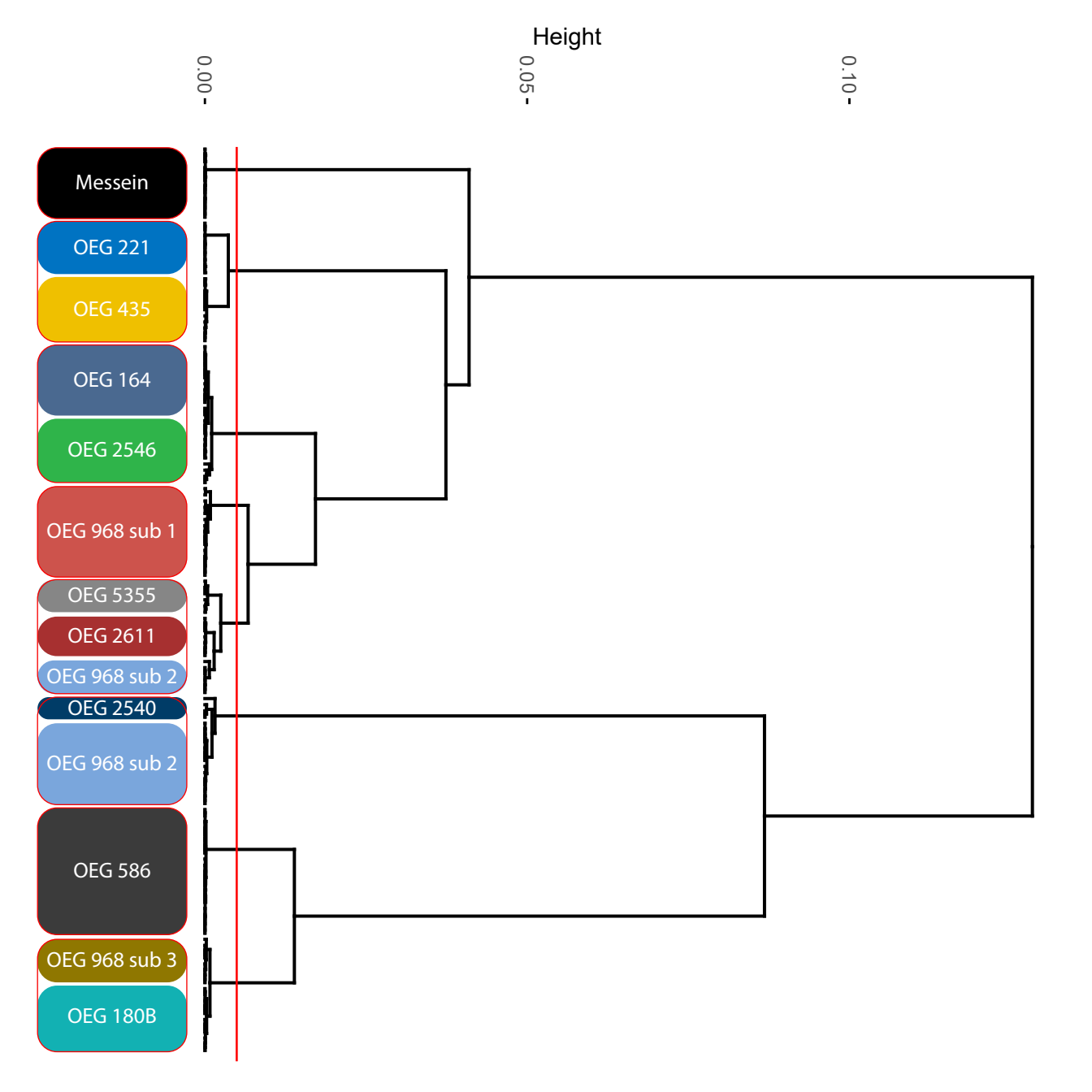
Intra-site

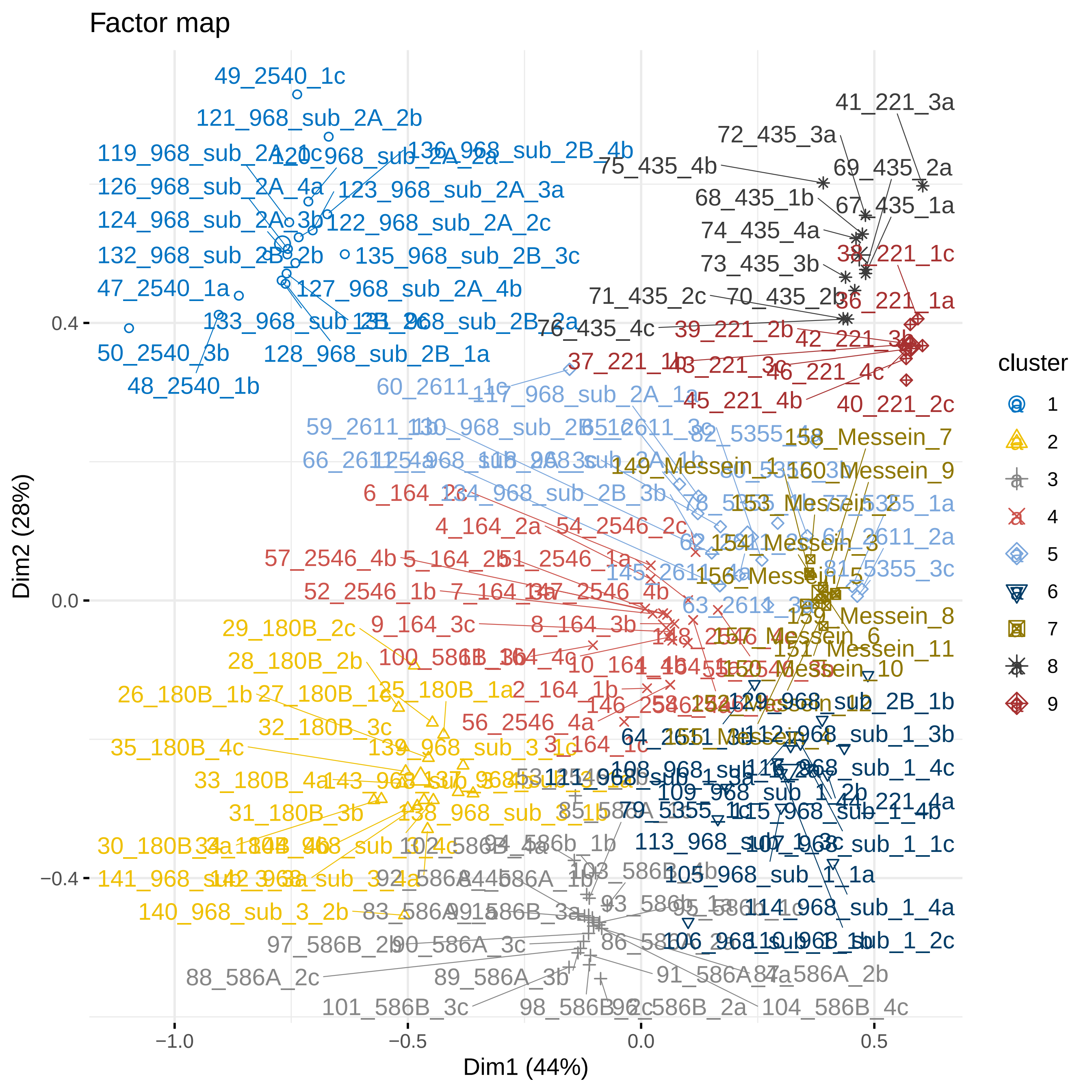

Scree plot
44%
28%
16%
5.7%
2.5%
1.2%
1%
0.7%
0.4%
0.2%
Percentage of explained variances
0
10
20
30
40
1
2
3
4
5
6
7
8
9
10
Dimensions


Variables − PCA
Xij_U
Xij_Th
Xij_Eu
Xij_Dy
Xij_Gd
Xij_Yb
Xij_Sm
Xij_Y
Xij_Nd
Xij_Pr
Xij_La
Xij_Ce
contrib
30
20
10
0.2
0.1
0.0
−0.1
−0.1
0.0
0.1
0.2
0.3
Dim2 (28%)
Dim1 (44%)

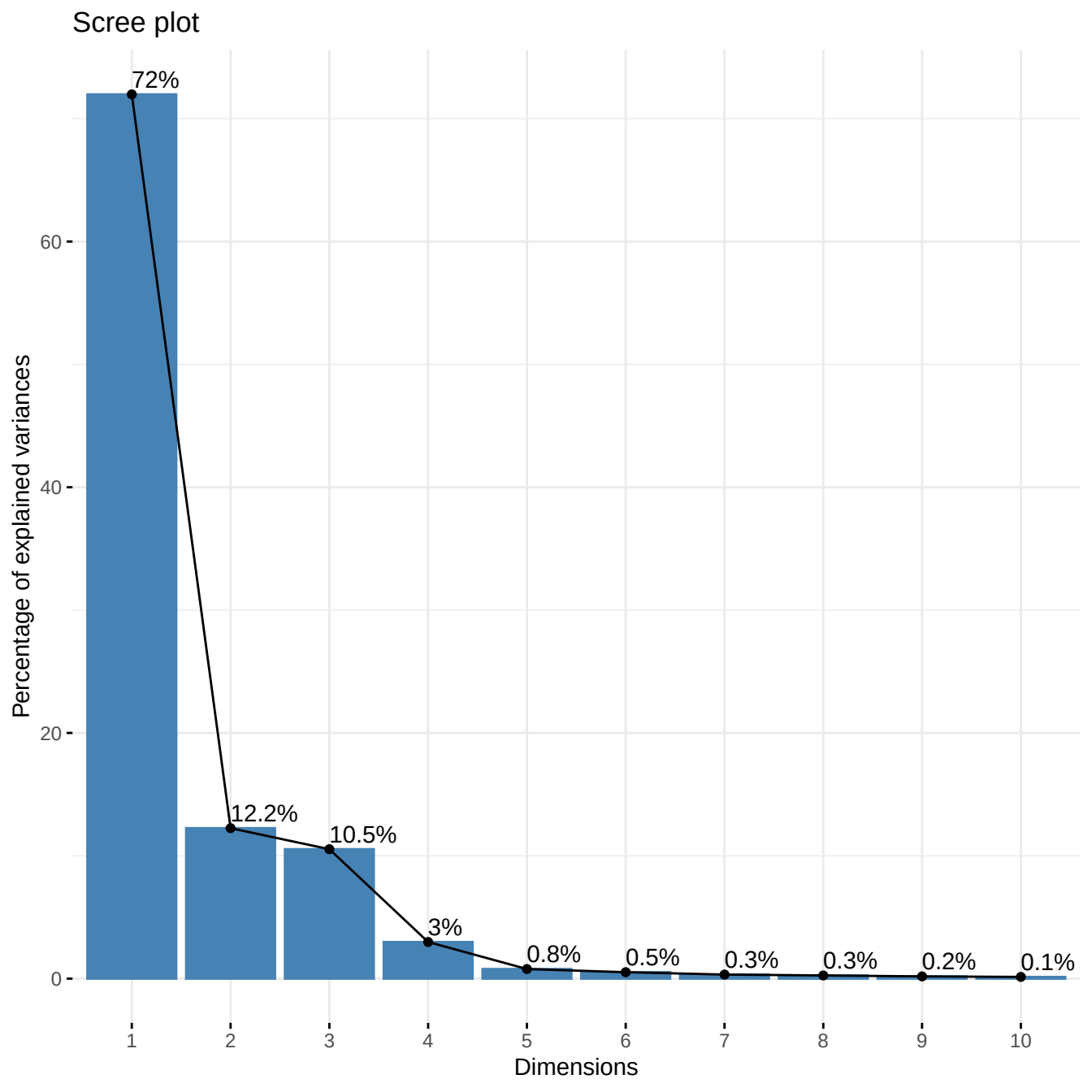

Individuals − PCA
Dim2 (28%)
Dim1 (44%)
0.4
0.0
−0.4
−1.0
−0.5
0.0
0.5
Groupes
Chute fa.onn.e
Bar
Firestriker
Knife?
nail
Offcut

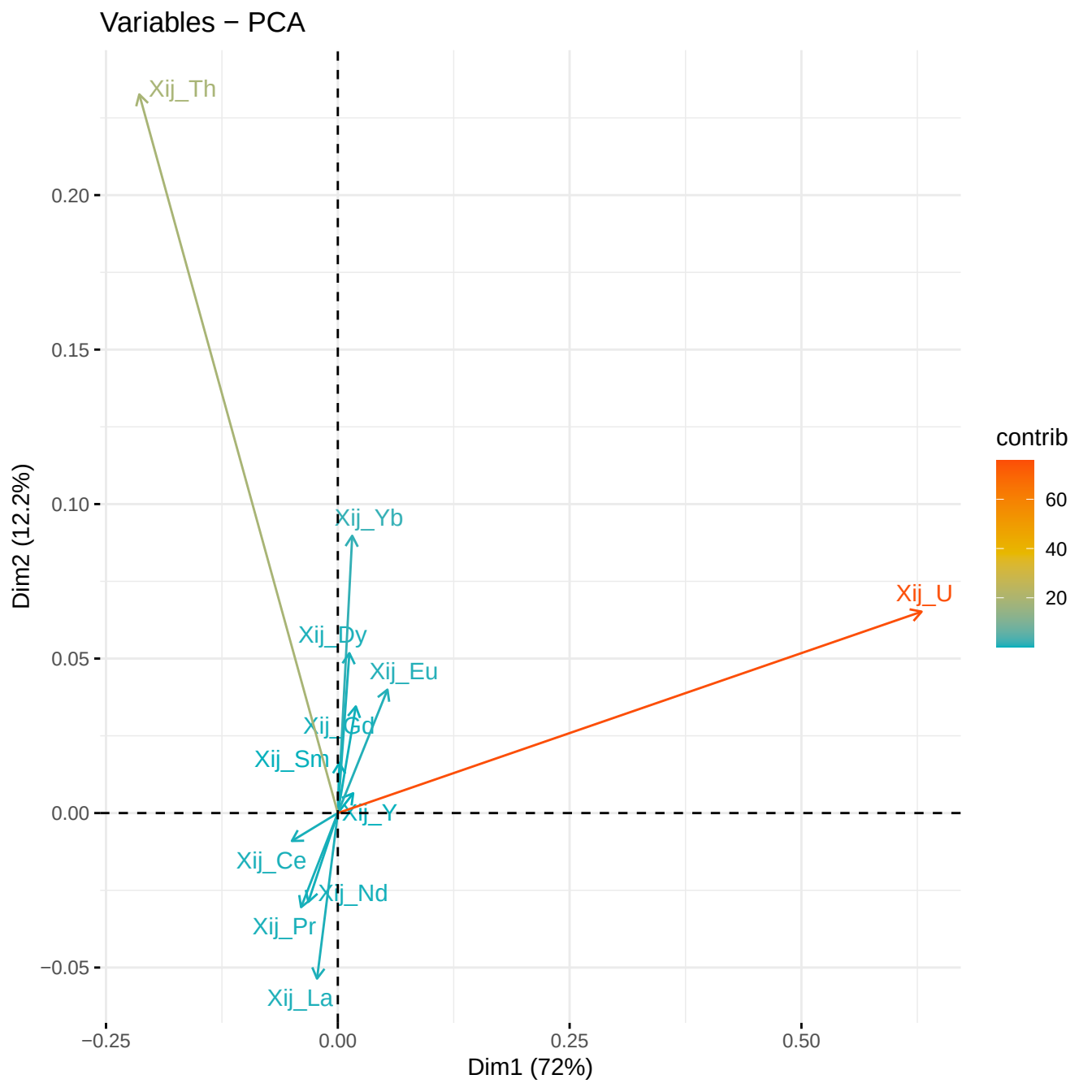

Optimal number of clusters
Gap statistic (k)
1.2
0.9
0.6
0.3
1
2
3
4
5
6
7
8
9
10
Number of clusters k

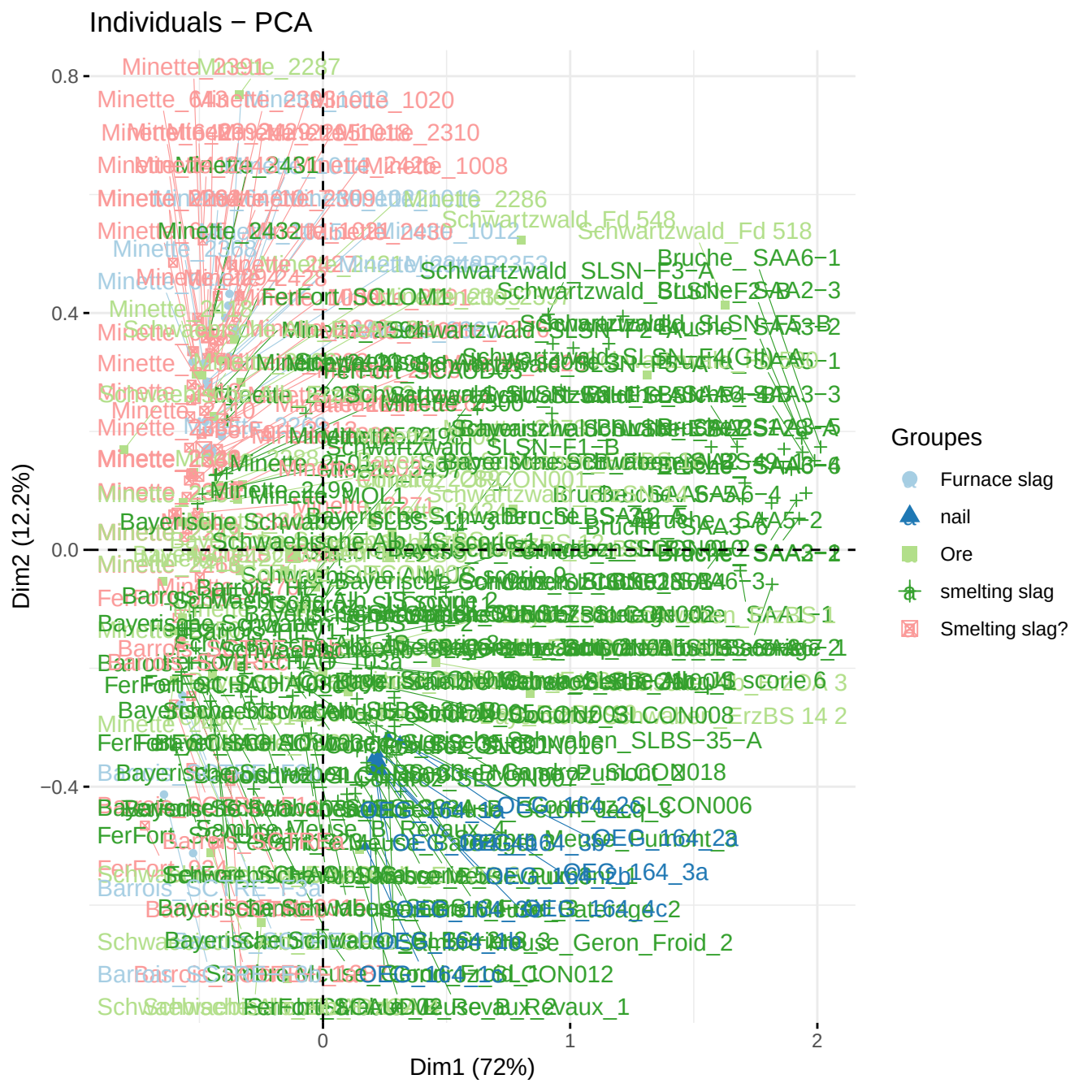

Height
0.00
0.05
0.10
Messein
OEG 221
OEG 435
OEG 164
OEG 2546
OEG 968 sub 1
OEG 5355
OEG 2611
OEG 968 sub 2
OEG 2540
OEG 968 sub 2
OEG 586
OEG 968 sub 3
OEG 180B

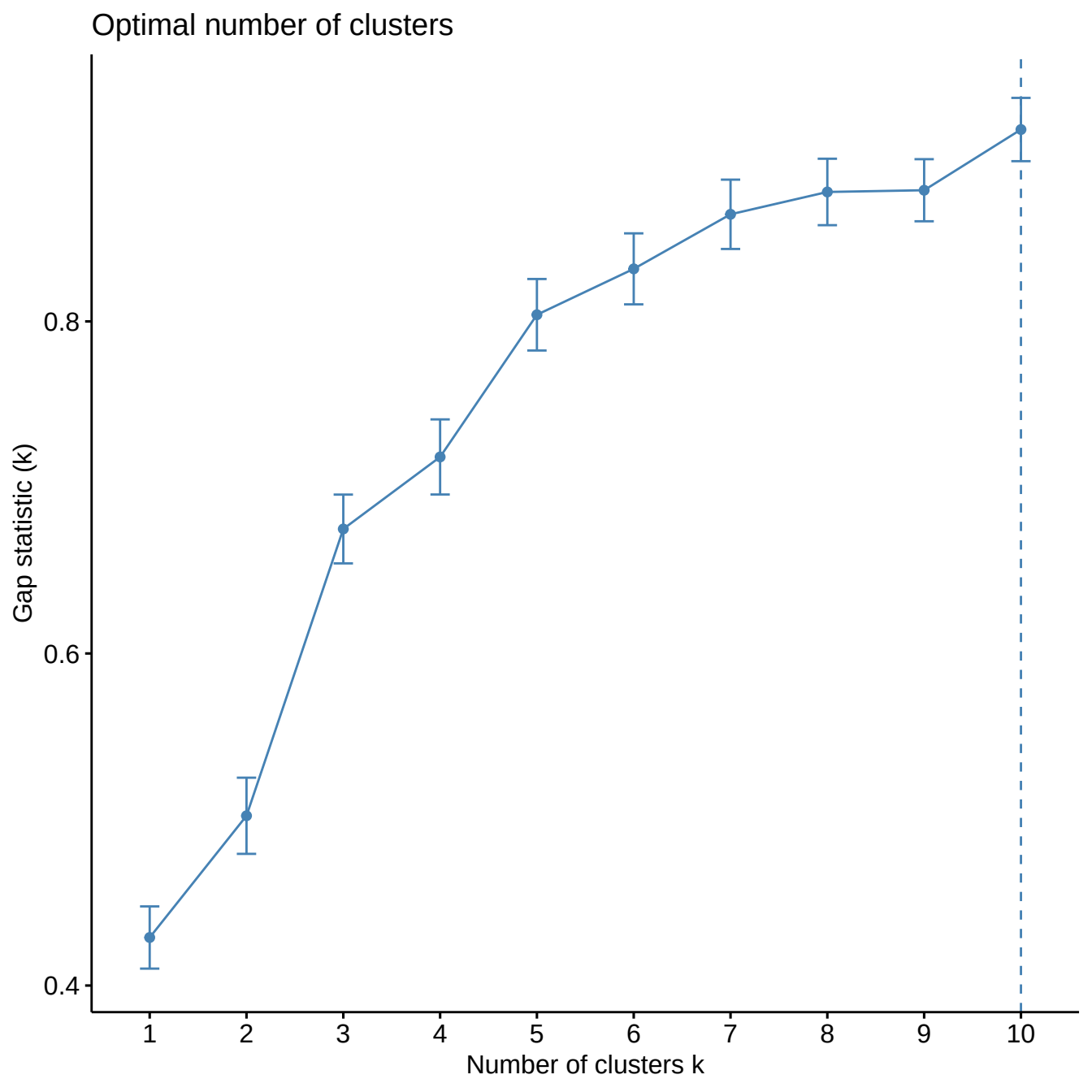

Factor map
Dim1 (44%)
Dim2 (28%)
−1.0
−0.5
0.0
0.5
0.4
0.0
−0.4
cluster
1
2
3
4
5
6
7
8
9
49_2540_1c
121_968_sub_2A_2b
136_968_sub_2B_4b
126_968_sub_2A_4a
123_968_sub_2A_3a
122_968_sub_2A_2c
135_968_sub_2B_3c
47_2540_1a
127_968_sub_2A_4b
50_2540_3b
128_968_sub_2B_1a
48_2540_1b
41_221_3a
72_435_3a
75_435_4b
69_435_2a
68_435_1b
67_435_1a
74_435_4a
73_435_3b
71_435_2c
76_435_4c
39_221_2b
37_221_1b
45_221_4b
40_221_2c
158_Messein_7
160_Messein_9
6_164_1a
4_164_2a
54_2546_2c
57_2546_4b
51_2546_1a
52_2546_1b
29_180B_2c
9_164_3c
8_164_3b
28_180B_2b
26_180B_1b
32_180B_3c
35_180B_4c
56_2546_4a
33_180B_4a
31_180B_3b
140_968_sub_3_2b
97_586B_2b
90_586A_3c
88_586A_2c
89_586A_3b
91_586A_4a
101_586B_3c
104_586B_4c
64_2611_3b
105_968_sub_1_1a
114_968_sub_1_4a
113_968_sub_1_3c

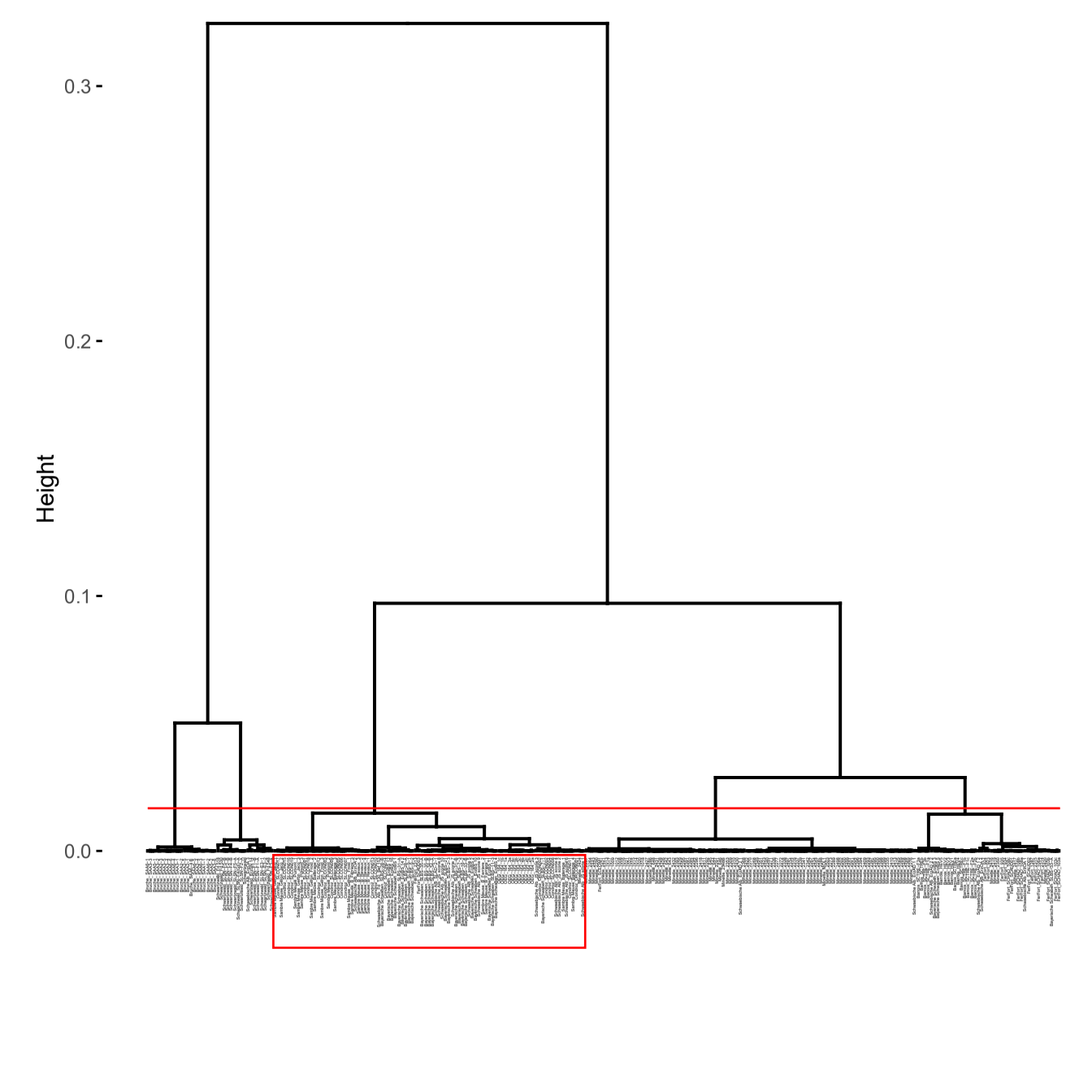
OEG 164

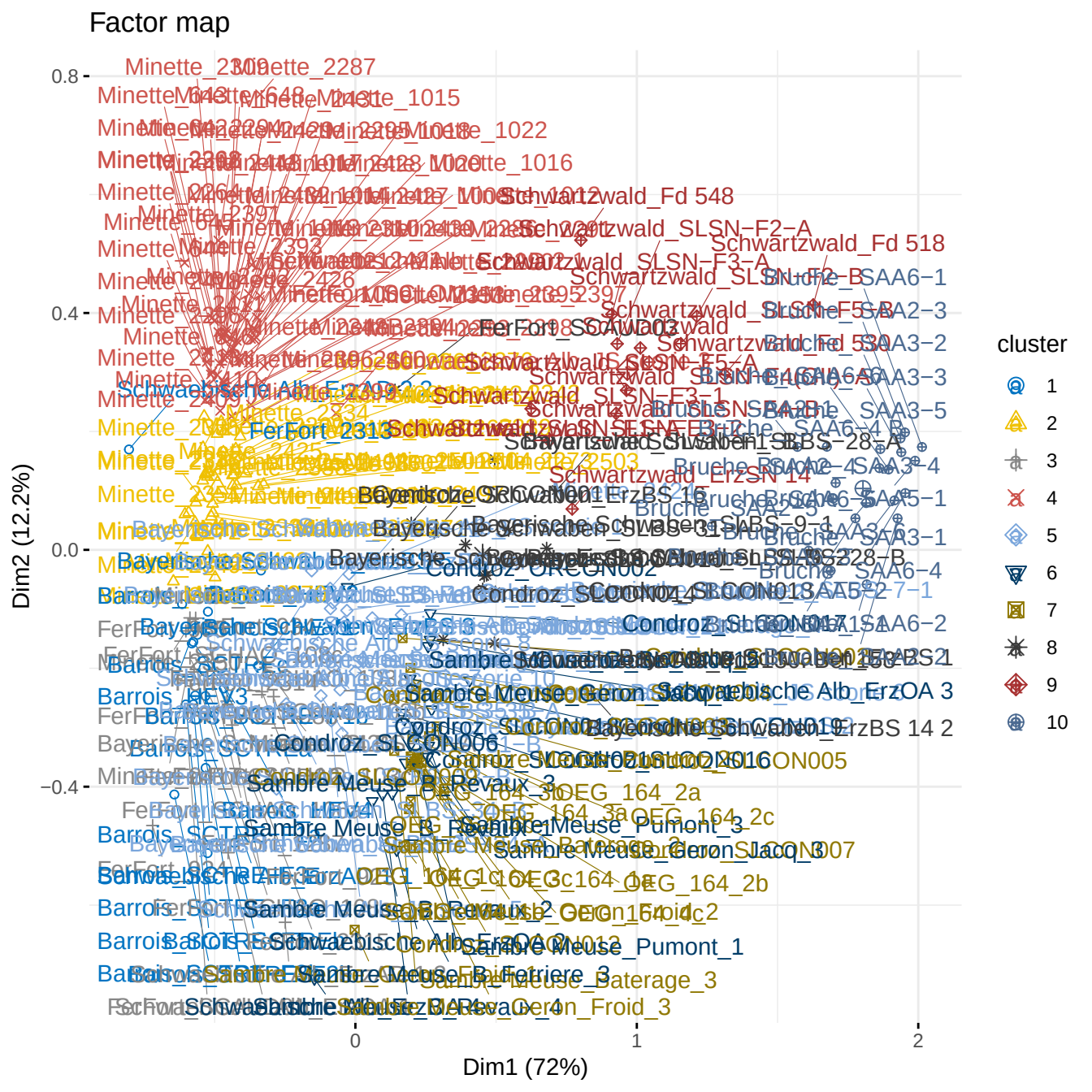

Scree plot
72%
12.2%
10.5%
3%
0.8%
0.5%
0.3%
0.3%
0.2%
0.1%
Percentage of explained variances
0
20
40
60
1
2
3
4
5
6
7
8
9
10
Dimensions

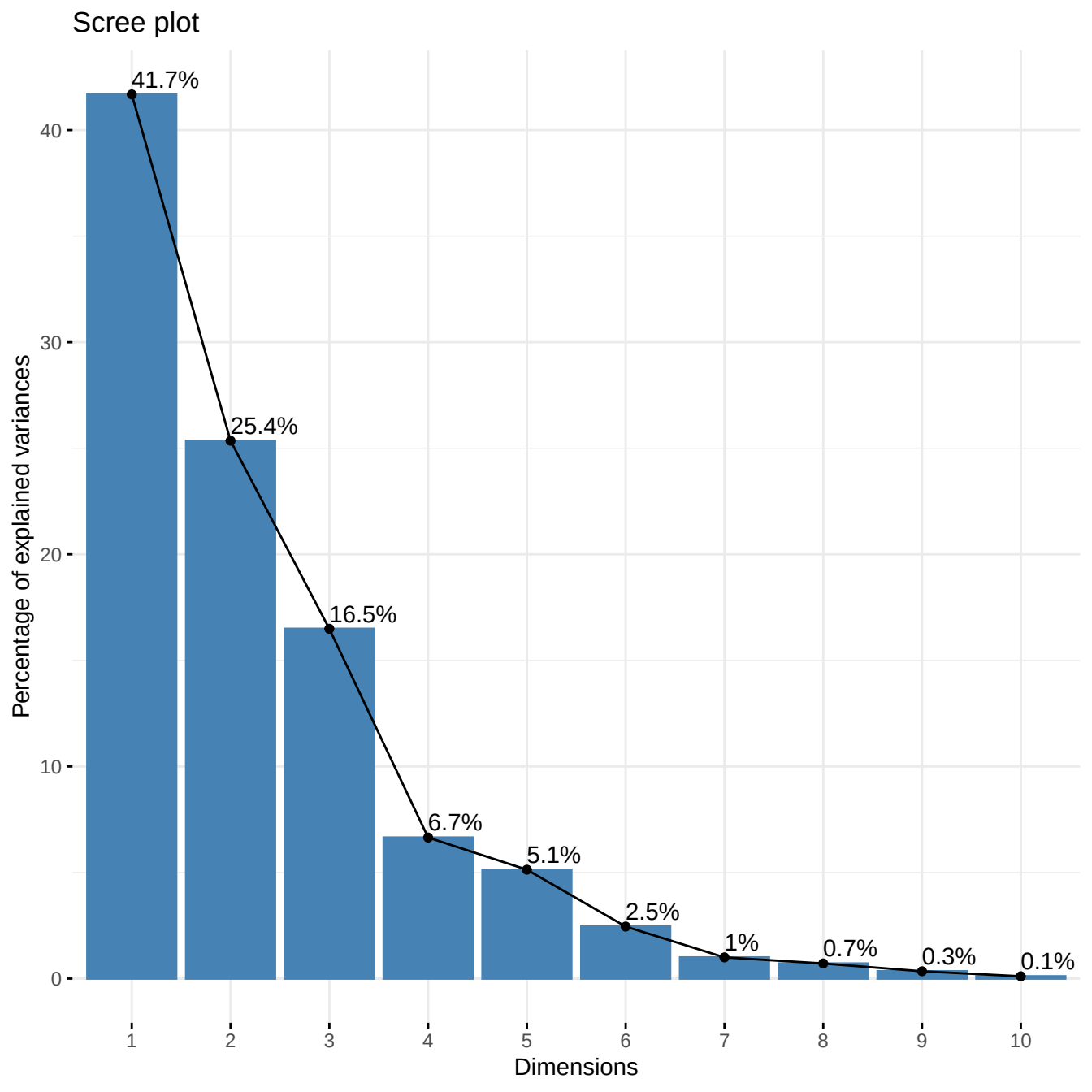

Variables − PCA
Xij_Th
Xij_Yb
Xij_U
Xij_Dy
Xij_Eu
Xij_Gd
Xij_Sm
Xij_Y
Xij_Ce
Xij_Nd
Xij_Pr
Xij_La
contrib
60
40
20
0.20
0.15
0.10
0.05
0.00
−0.05
Dim2 (12.2%)
−0.25
0.00
0.25
0.50
Dim1 (72%)

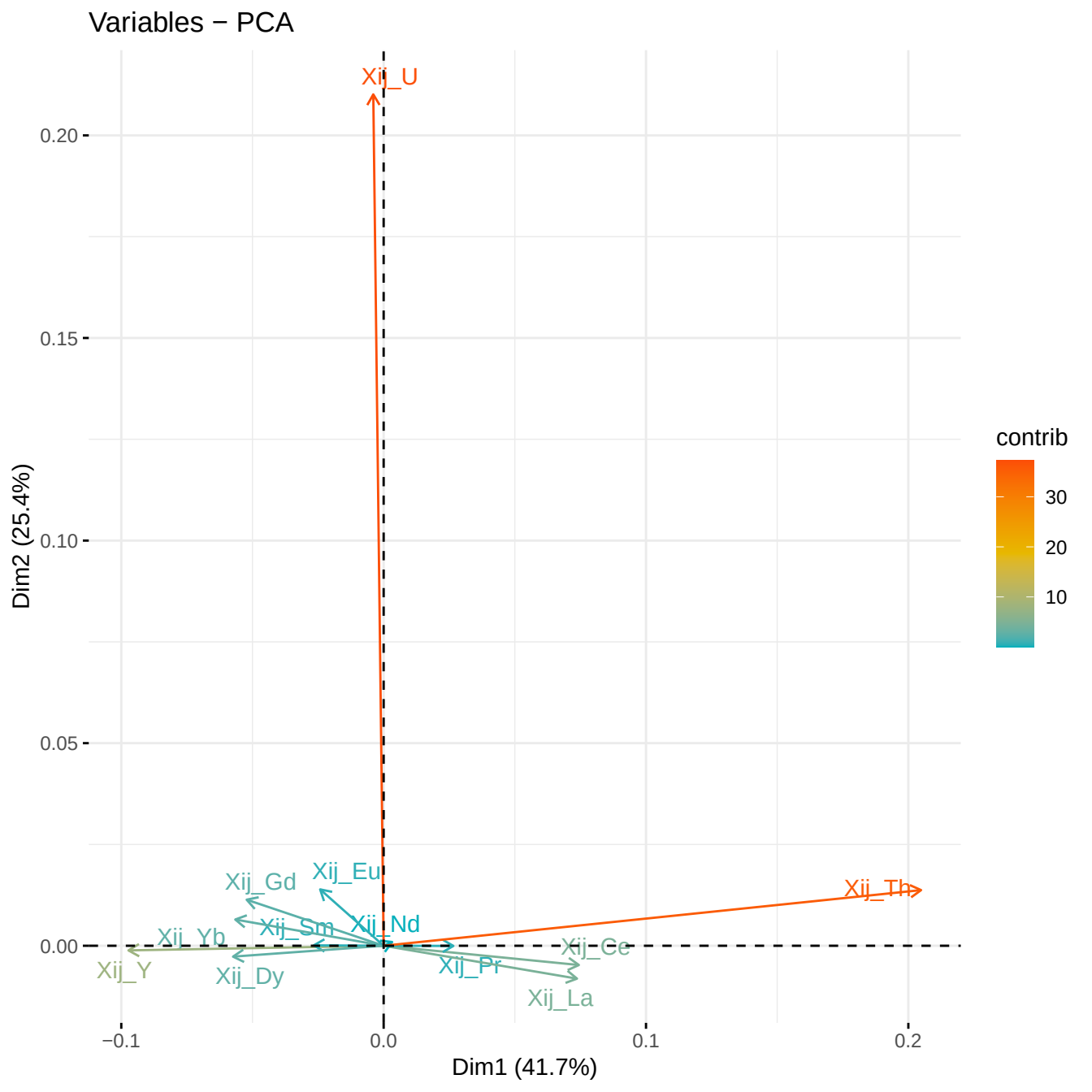

Individuals − PCA
Dim1 (72%)
Dim2 (12.2%)
0.8
0.4
0.0
−0.4
0
1
2
Groupes
Furnace slag
nail
Ore
smelting slag
Smelting slag?

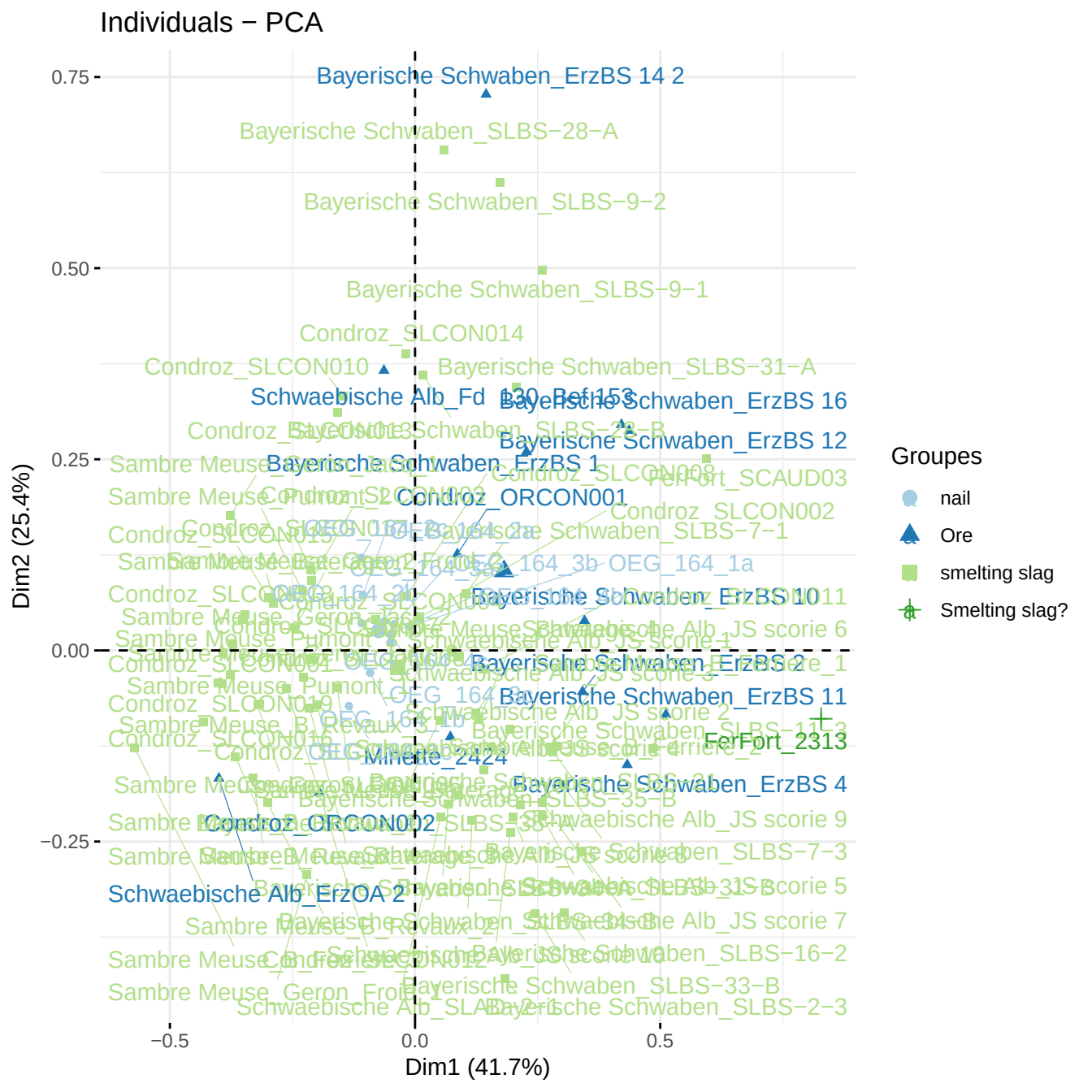

Optimal number of clusters
Gap statistic (k)
0.8
0.6
0.4
1
2
3
4
5
6
7
8
9
10
Number of clusters k

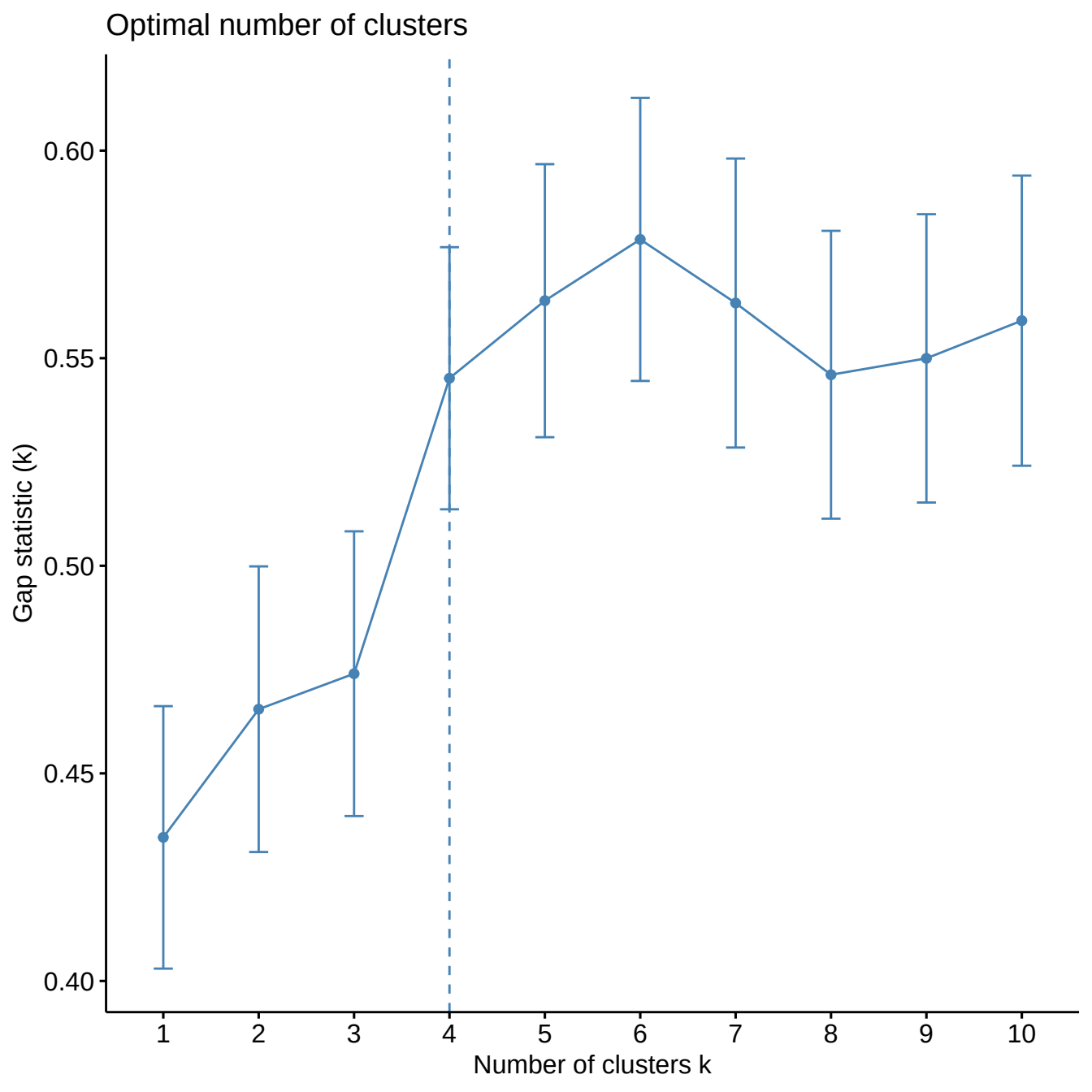

Height
0.3
0.2
0.1
0.0

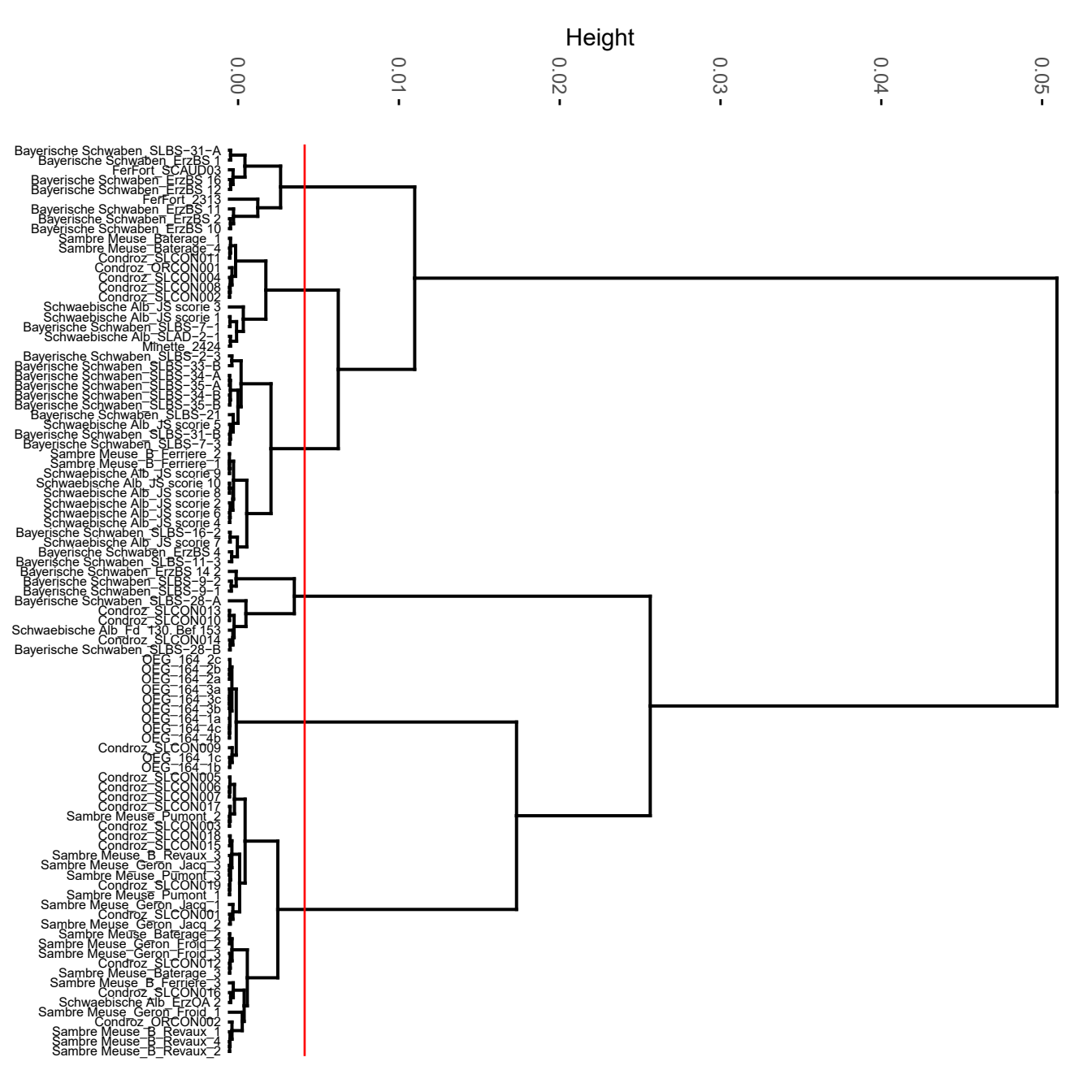

Factor map
Dim2 (12.2%)
Dim1 (72%)
0.8
0.4
0.0
−0.4
0
1
2
cluster
1
2
3
4
5
6
7
8
9
10

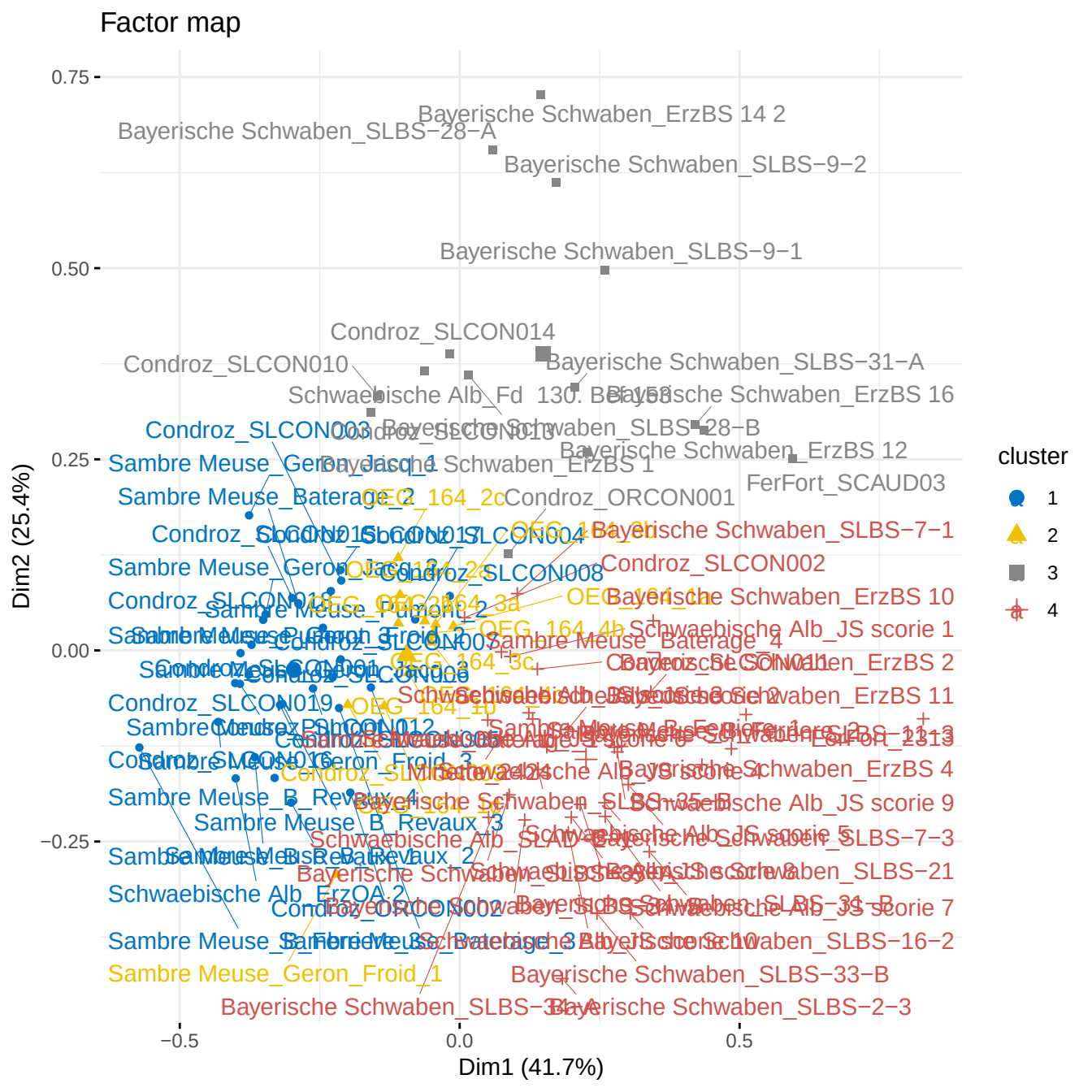

Scree plot
41.7%
25.4%
16.5%
6.7%
5.1%
2.5%
1%
0.7%
0.3%
0.1%
Percentage of explained variances
0
10
20
30
40
1
2
3
4
5
6
7
8
9
10
Dimensions


Variables − PCA
Xij_U
Xij_Th
Xij_Gd
Xij_Eu
Xij_Sm
Xij_Nd
Xij_Yb
Xij_Y
Xij_Dy
Xij_Pr
Xij_Ce
Xij_La
contrib
30
20
10
0.20
0.15
0.10
0.05
0.00
−0.1
0.0
0.1
0.2
Dim2 (25.4%)
Dim1 (41.7%)

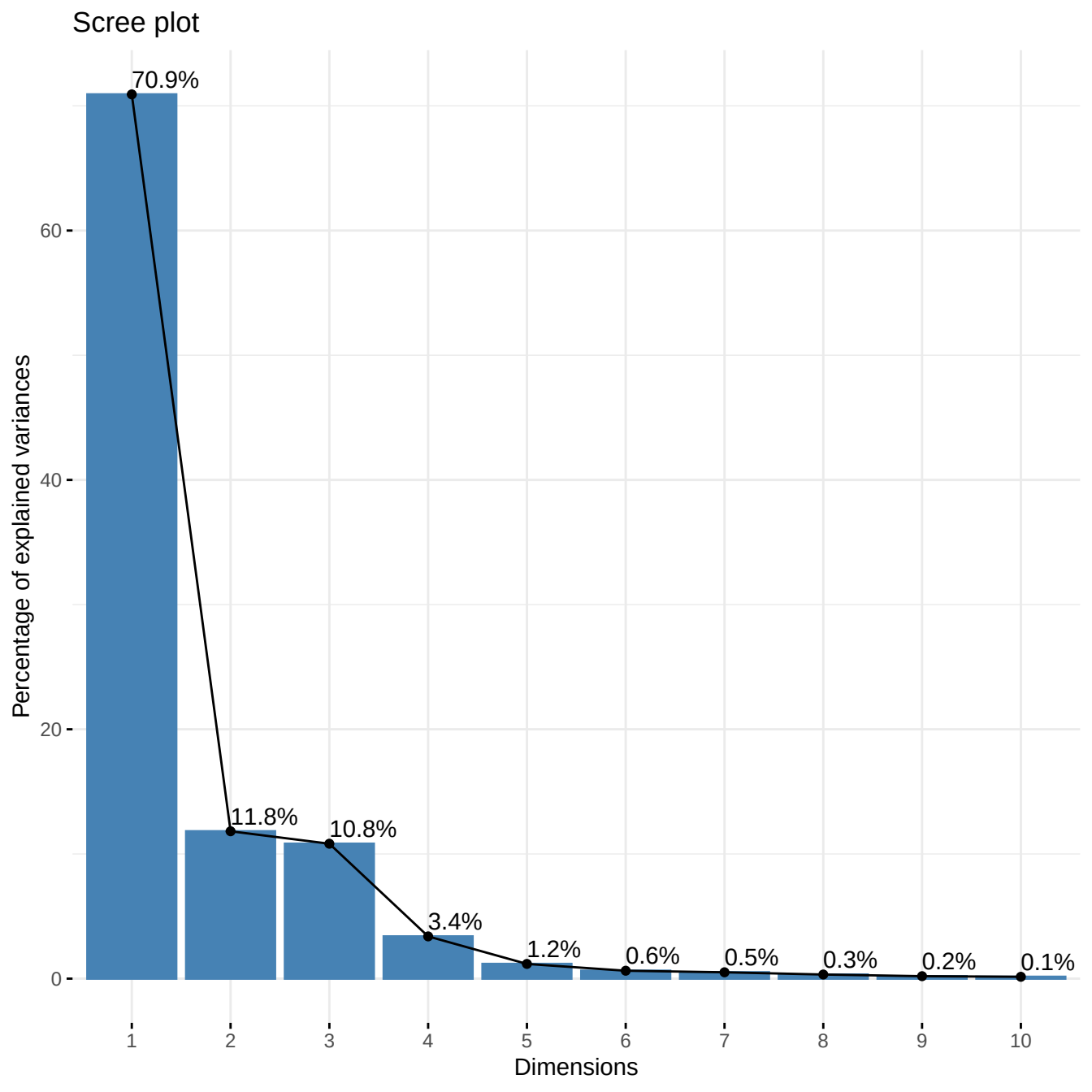

Individuals − PCA
Bayerische Schwaben_ErzBS 14 2
Bayerische Schwaben_SLBS−28−A
Bayerische Schwaben_SLBS−9−2
Bayerische Schwaben_SLBS−9−1
Condroz_SLCON014
Condroz_SLCON010
Bayerische Schwaben_SLBS−31−A
Schwaebische Alb_Fd_130_Bef153
Bayerische Schwaben_ErzBS 16
Bayerische Schwaben_ErzBS 12
Bayerische Schwaben_ErzBS 1
Condroz_ORCON001
Condroz_SLCON002
Bayerische Schwaben_SLBS−7−1
Bayerische Schwaben_ErzBS 10
Bayerische Schwaben_ErzBS 2
Bayerische Schwaben_ErzBS 11
FerFort_2313
Mineile_2424
Bayerische Schwaben_ErzBS 4
Condroz_ORCON002
Schwaebische Alb_ErzOA 2
Groupes
nail
Ore
smelting slag
Smelting slag?
Dim2 (25.4%)
Dim1 (41.7%)
0.75
0.50
0.25
0.00
−0.25
−0.5
0.0
0.5

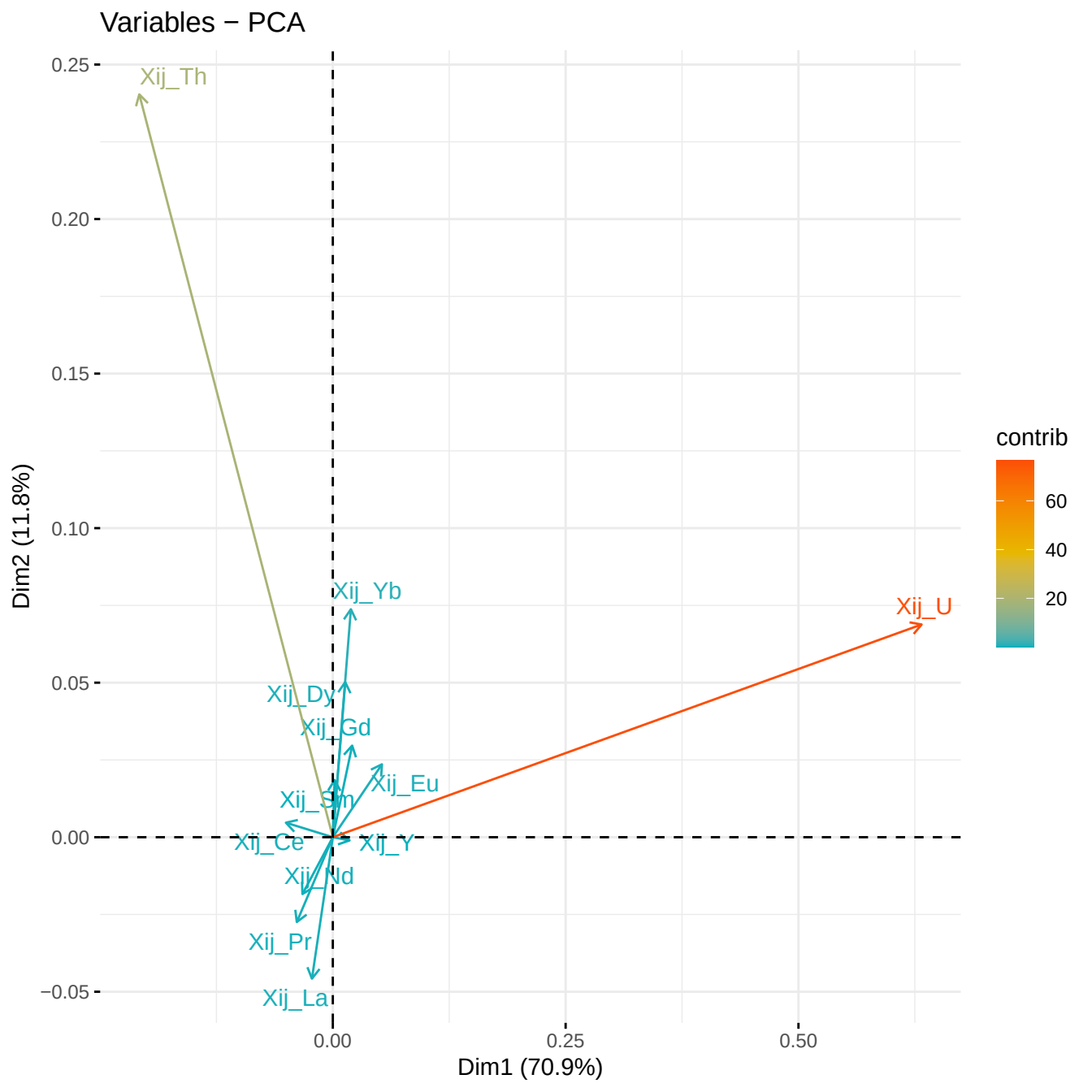

Optimal number of clusters
Gap statistic (k)
0.60
0.55
0.50
0.45
0.40
1
2
3
4
5
6
7
8
9
10
Number of clusters k

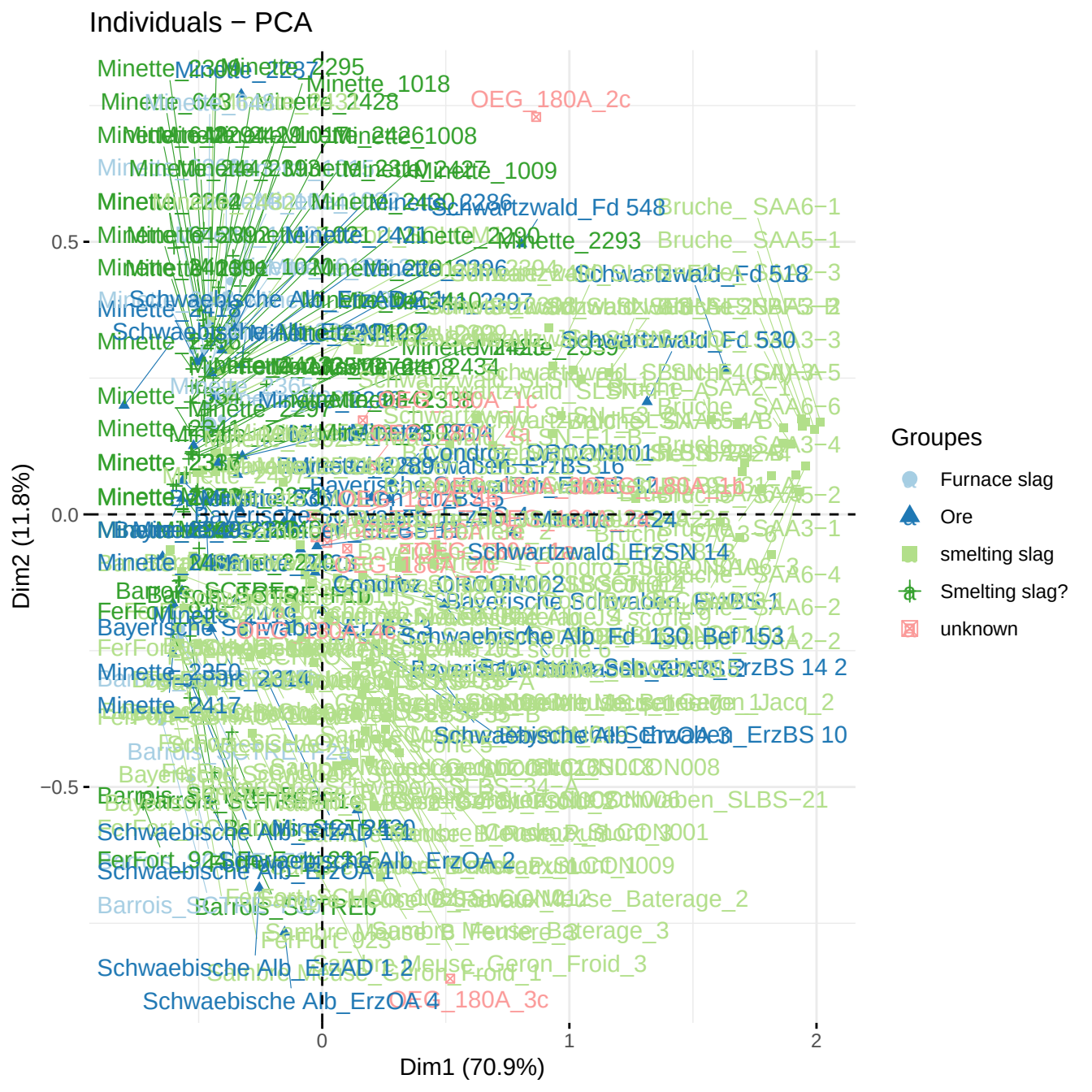

Height
0.00
0.01
0.02
0.03
0.04
0.05
Bayerische Schwaben_SLBS−31−A
Bayerische Schwaben_ErzBS 1
FerFort_SCAUD03
Bayerische Schwaben_ErzBS 16
Bayerische Schwaben_ErzBS 12
FerFort_2313
Bayerische Schwaben_ErzBS 11
Bayerische Schwaben_ErzBS 2
Bayerische Schwaben_ErzBS 10
Sambre Meuse_Baterage_1
Sambre Meuse_Baterage_4
Condroz_SLCON011
Condroz_ORCON001
Condroz_SLCON004
Condroz_SLCON008
Condroz_SLCON002
Schwaebische Alb_JS scorie 3
Schwaebische Alb_JS scorie 1
Bayerische Schwaben_SLBS−7−1
Schwaebische Alb_SLAD−2−1
Minette_2424
Bayerische Schwaben_SLBS−2−3
Bayerische Schwaben_SLBS−33−B
Bayerische Schwaben_SLBS−34−A
Bayerische Schwaben_SLBS−35−A
Bayerische Schwaben_SLBS−34−B
Bayerische Schwaben_SLBS−35−B
Bayerische Schwaben_SLBS−21
Schwaebische Alb_JS scorie 5
Bayerische Schwaben_SLBS−31−B
Bayerische Schwaben_SLBS−7−3
Sambre Meuse_B_Ferriere_2
Sambre Meuse_B_Ferriere_1
Schwaebische Alb_JS scorie 9
Schwaebische Alb_JS scorie 10
Schwaebische Alb_JS scorie 8
Schwaebische Alb_JS scorie 2
Schwaebische Alb_JS scorie 6
Schwaebische Alb_JS scorie 4
Bayerische Schwaben_SLBS−16−2
Schwaebische Alb_JS scorie 7
Bayerische Schwaben_ErzBS 4
Bayerische Schwaben_SLBS−11−3
Bayerische Schwaben_ErzBS 14 2
Bayerische Schwaben_SLBS−9−2
Bayerische Schwaben_SLBS−9−1
Bayerische Schwaben_SLBS−28−A
Condroz_SLCON013
Condroz_SLCON010
Schwaebische Alb_Fd_130_Bef 153
Condroz_SLCON014
Bayerische Schwaben_SLBS−28−B
OEG_164_2c
OEG_164_2b
OEG_164_2a
OEG_164_3a
OEG_164_3c
OEG_164_3b
OEG_164_1a
OEG_164_4c
OEG_164_4b
Condroz_SLCON009
OEG_164_1c
OEG_164_1b
Condroz_SLCON005
Condroz_SLCON006
Condroz_SLCON007
Condroz_SLCON017
Sambre Meuse_Pumont_2
Condroz_SLCON003
Condroz_SLCON018
Condroz_SLCON015
Sambre Meuse_B_Revaux_3
Sambre Meuse_Geron_Jacq_3
Sambre Meuse_Pumont_3
Condroz_SLCON019
Sambre Meuse_Pumont_1
Sambre Meuse_Geron_Jacq_1
Condroz_SLCON001
Sambre Meuse_Geron_Jacq_2
Sambre Meuse_Baterage_2
Sambre Meuse_Geron_Froid_2
Sambre Meuse_Geron_Froid_3
Condroz_SLCON012
Sambre Meuse_Baterage_3
Sambre Meuse_B_Ferriere_3
Condroz_SLCON016
Schwaebische Alb_ErzOA 2
Sambre Meuse_Geron_Froid_1
Condroz_ORCON002
Sambre Meuse_B_Revaux_1
Sambre Meuse_B_Revaux_4
Sambre Meuse_B_Revaux_2

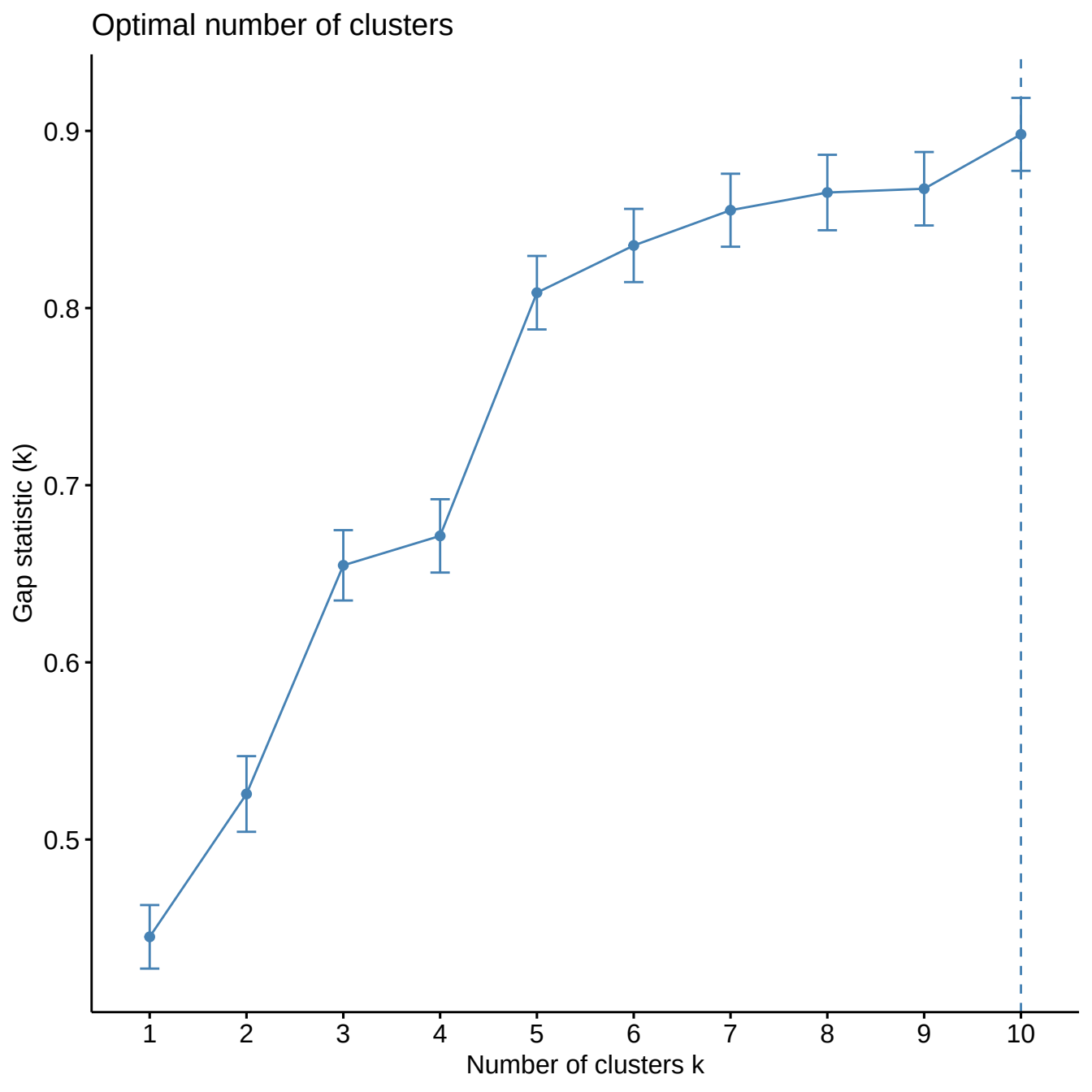

Factor map
Dim1 (41.7%)
Dim2 (25.4%)
cluster
1
2
3
4
Bayerische Schwaben_ErzBS 14 2
Bayerische Schwaben_SLBS−28−A
Bayerische Schwaben_SLBS−9−2
Bayerische Schwaben_SLBS−9−1
Condroz_SLCON014
Condroz_SLCON010
Bayerische Schwaben_SLBS−31−A
Schwaebische Alb_Fd 130. Bayerische Schwaben_ErzBS 16
Condroz_SLCON013
Bayerische Schwaben_SLBS−28−B
Condroz_SLCON003
Bayerische Schwaben_ErzBS 12
Sambre Meuse_Geron_Froid_1
Bayerische Schwaben_ErzBS 1
FerFort_SCAUD03
Sambre Meuse_Baterage_2
OEG_164_2c
Condroz_ORCON001
Condroz_SLCON015
Condroz_SLCON017
Condroz_SLCON004
Bayerische Schwaben_SLBS−7−1
Sambre Meuse_Geron_Froid_2
Condroz_SLCON008
Condroz_SLCON002
Condroz_SLCON018
OEG_164_3a
Bayerische Schwaben_ErzBS 10
Sambre Meuse_Puhem_2
OEG_164_4b
Schwaebische Alb_JS scorie 1
Sambre Meuse_Baterage_3
Condroz_SLCON005
Sambre Meuse_Baterage_4
OEG_164_3c
Condroz_SLCON011
Bayerische Schwaben_ErzBS 2
Condroz_SLCON006
Condroz_SLCON001
Schwaebische Alb_JS scorie 6
Bayerische Schwaben_ErzBS 11
Condroz_SLCON019
OEG_164_4b
Sambre Meuse_Puhem_1
Condroz_SLCON012
Condroz_SLCON016
Sambre Meuse_Geron_Froid_3
Condroz_SLCON007
Schwaebische Alb_JS scorie 4
Bayerische Schwaben_ErzBS 4
Sambre Meuse_B_Revaux_4
OEG_164_1c
Bayerische Schwaben_SLBS−35−B
Schwaebische Alb_JS scorie 9
Sambre Meuse_B_Revaux_3
Schwaebische Alb_SLAD_2
Bayerische Schwaben_SLBS−7−3
Sambre Meuse_B_Revaux_2
Bayerische Schwaben_SLBS−13
Bayerische Schwaben_SLBS−21
Schwaebische Alb_ErzOA_2
Condroz_ORCON002
Bayerische Schwaben_SLBS−31−B
Schwaebische Alb_JS scorie 7
Sambre Meuse_Baterage_1
Bayerische Schwaben_SLBS−16−2
Sambre Meuse_Geron_Froid_1
Bayerische Schwaben_SLBS−33−B
Bayerische Schwaben_SLBS−3
Bayerische Schwaben_SLBS−2−3
0.75
0.50
0.25
0.00
−0.25
−0.5
0.0
0.5

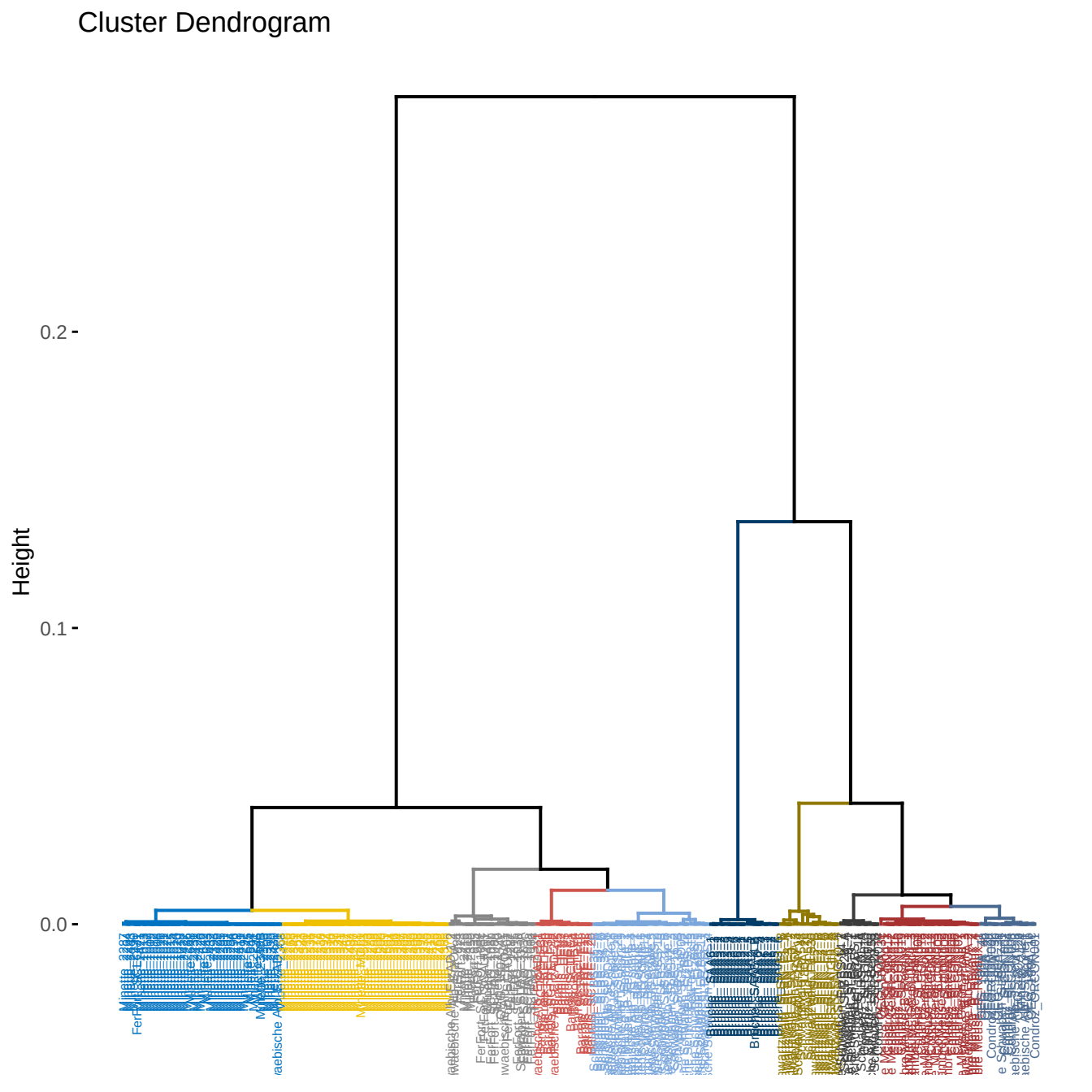
OEG 180A

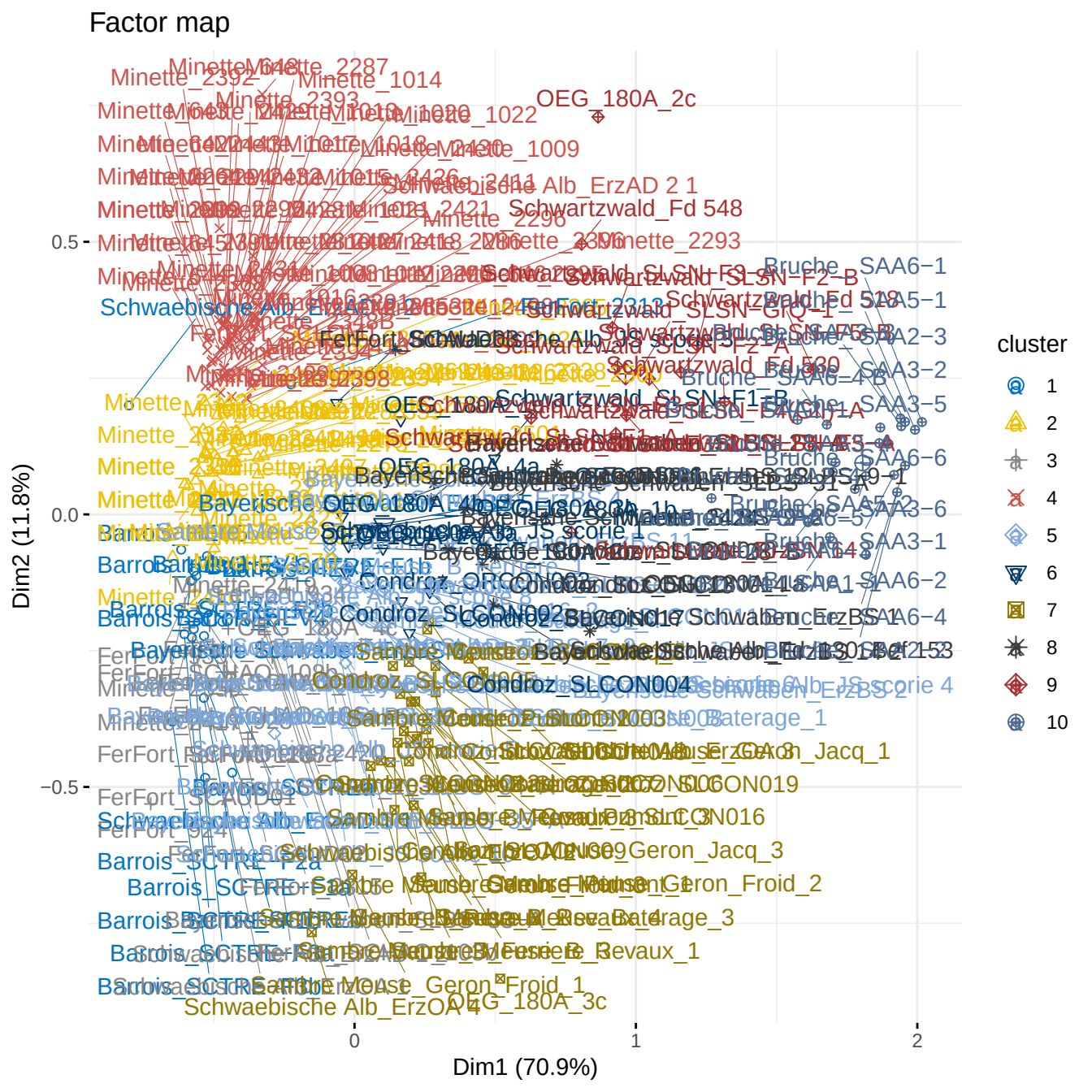

Scree plot
70.9%
11.8%
10.8%
3.4%
1.2%
0.6%
0.5%
0.3%
0.2%
0.1%
Percentage of explained variances
0
20
40
60
1
2
3
4
5
6
7
8
9
10
Dimensions

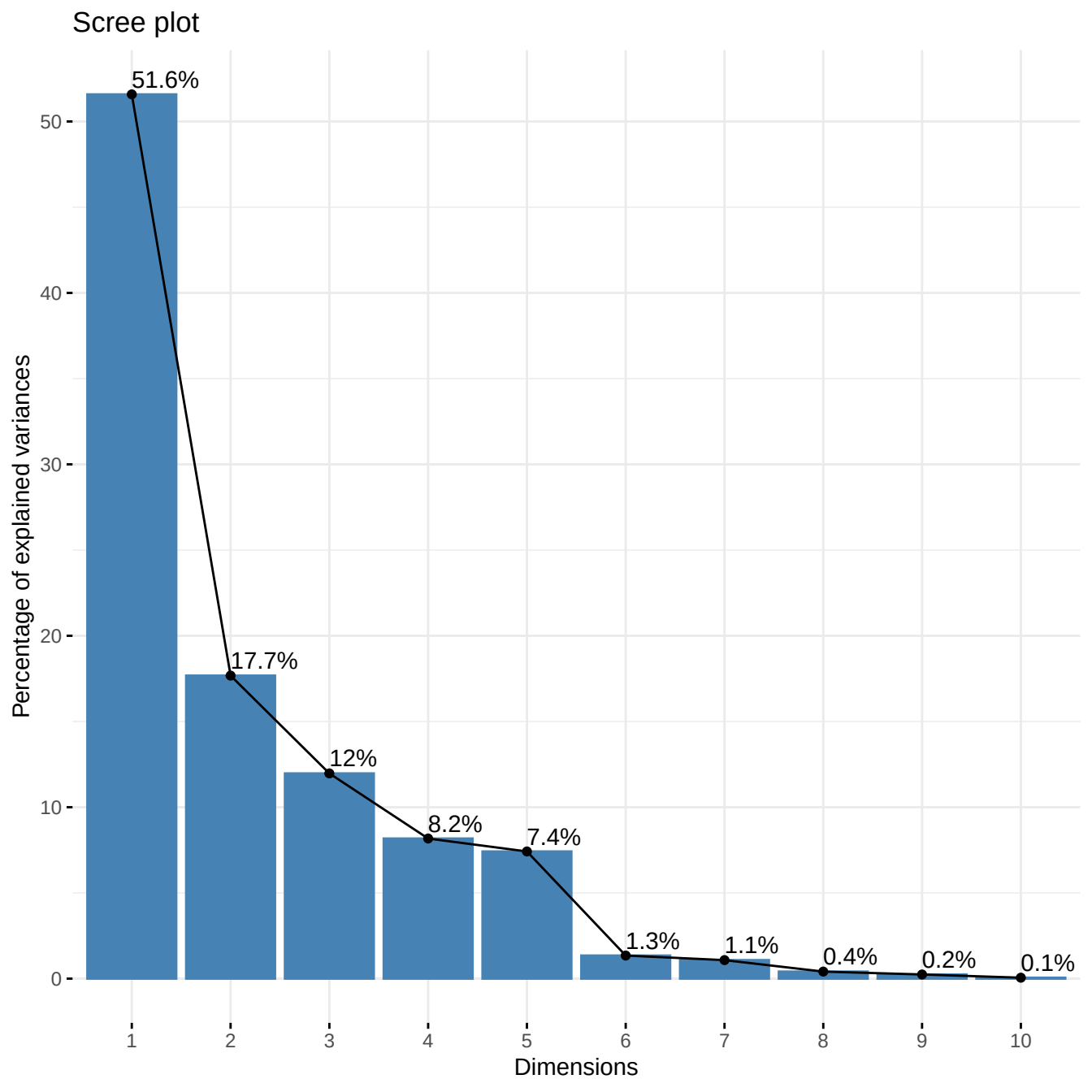

Variables − PCA
Xij_Th
Xij_Yb
Xij_U
Xij_Dy
Xij_Gd
Xij_Eu
Xij_Sm
Xij_Ce
Xij_Y
Xij_Nd
Xij_Pr
Xij_La
0.25
0.20
0.15
0.10
0.05
0.00
−0.05
0.00
0.25
0.50
Dim2 (11.8%)
Dim1 (70.9%)
contrib
60
40
20

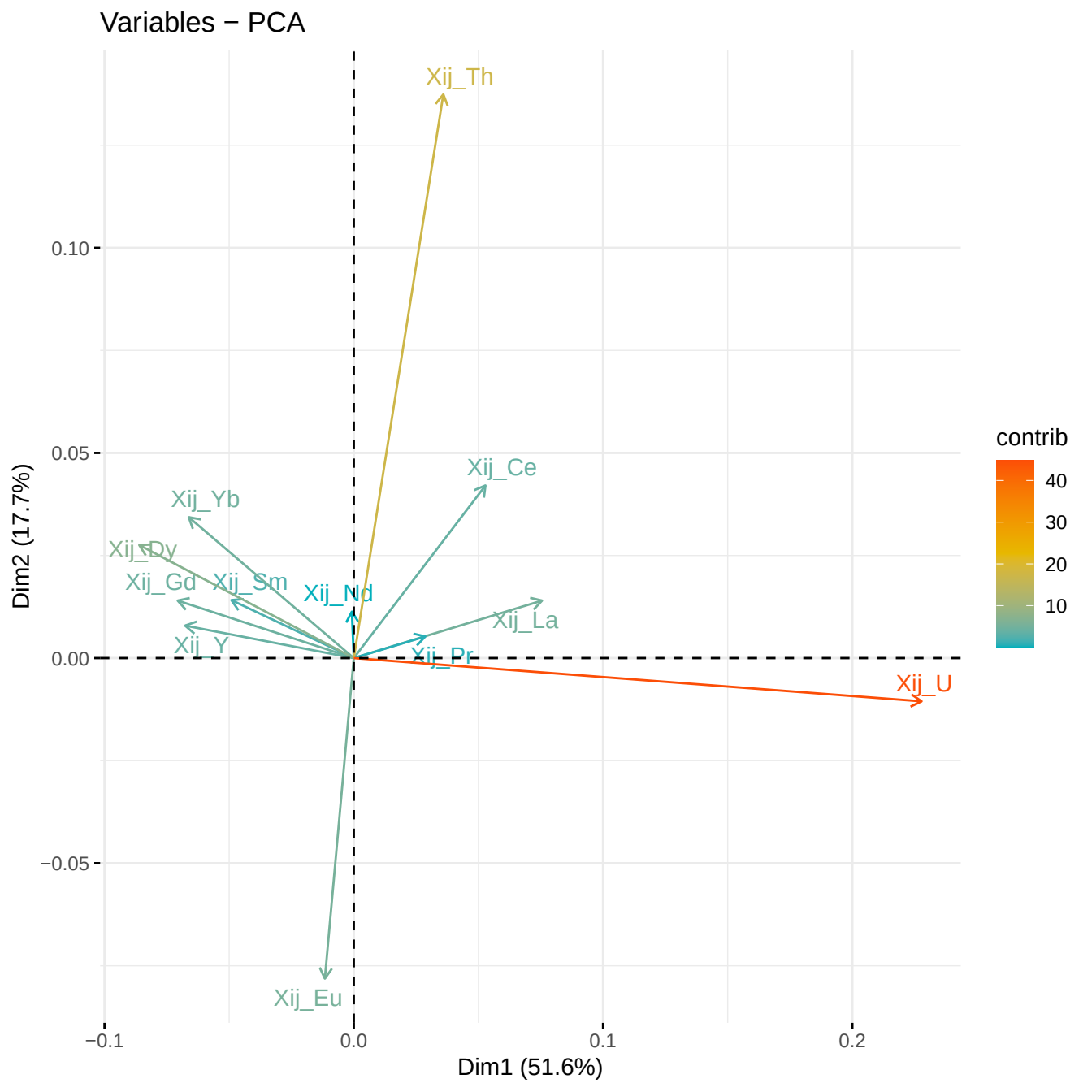

Individuals − PCA
Dim2 (11.8%)
Dim1 (70.9%)
0.5
0.0
−0.5
0
1
2
Groupes
Furnace slag
Ore
smelting slag
Smelting slag?
unknown

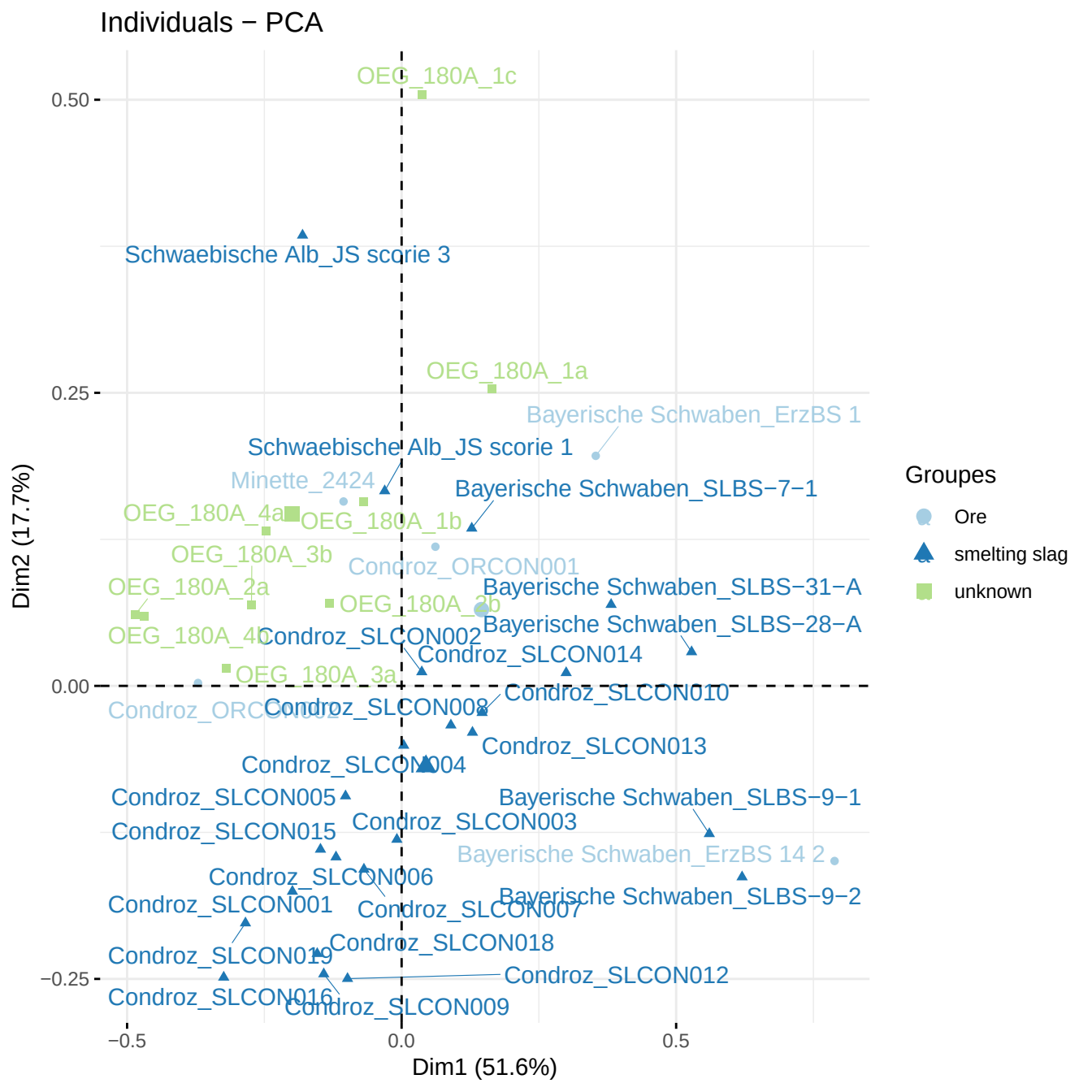

Optimal number of clusters
Gap statistic (k)
0.9
0.8
0.7
0.6
0.5
1
2
3
4
5
6
7
8
9
10
Number of clusters k

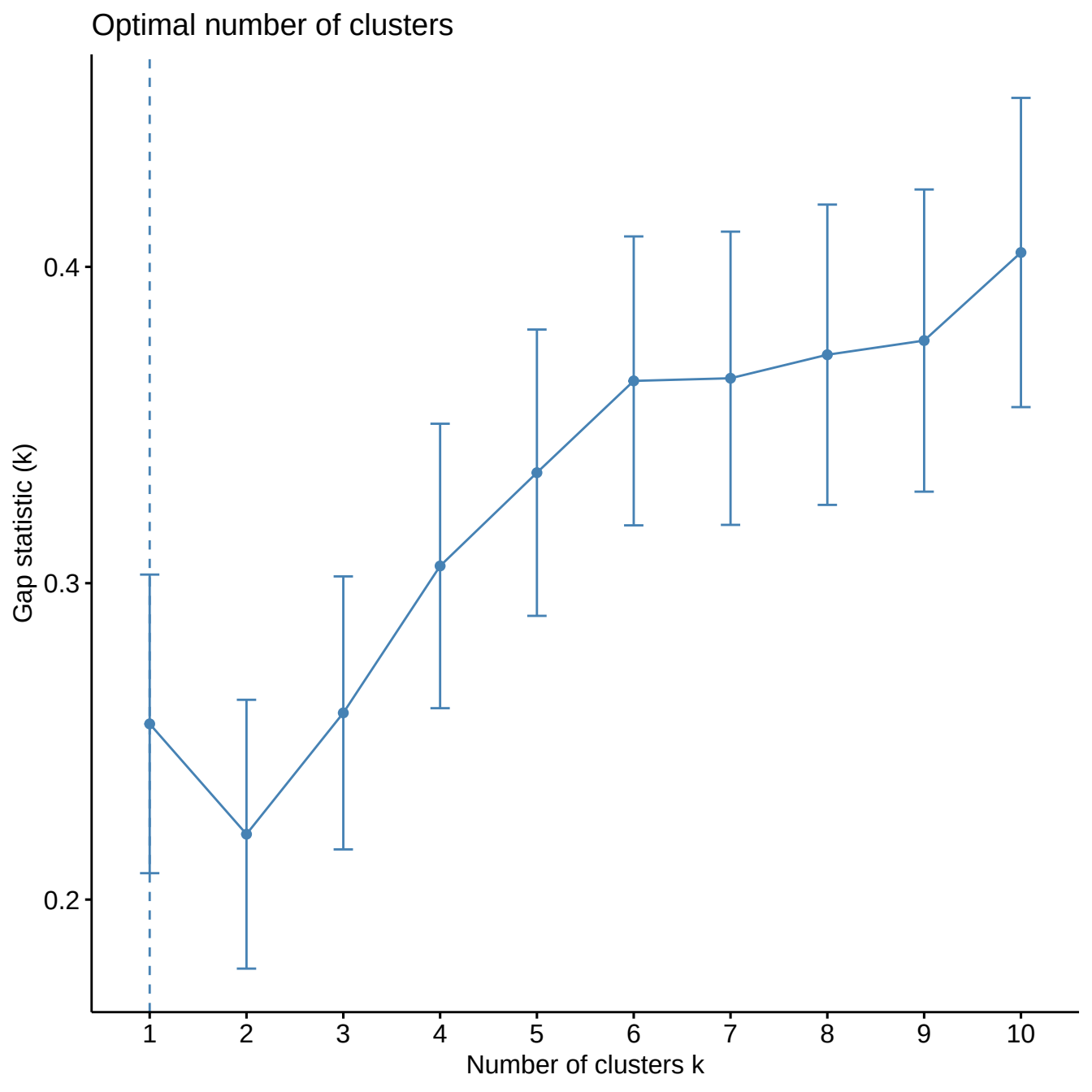

Cluster Dendrogram
Height
0.2
0.1
0.0

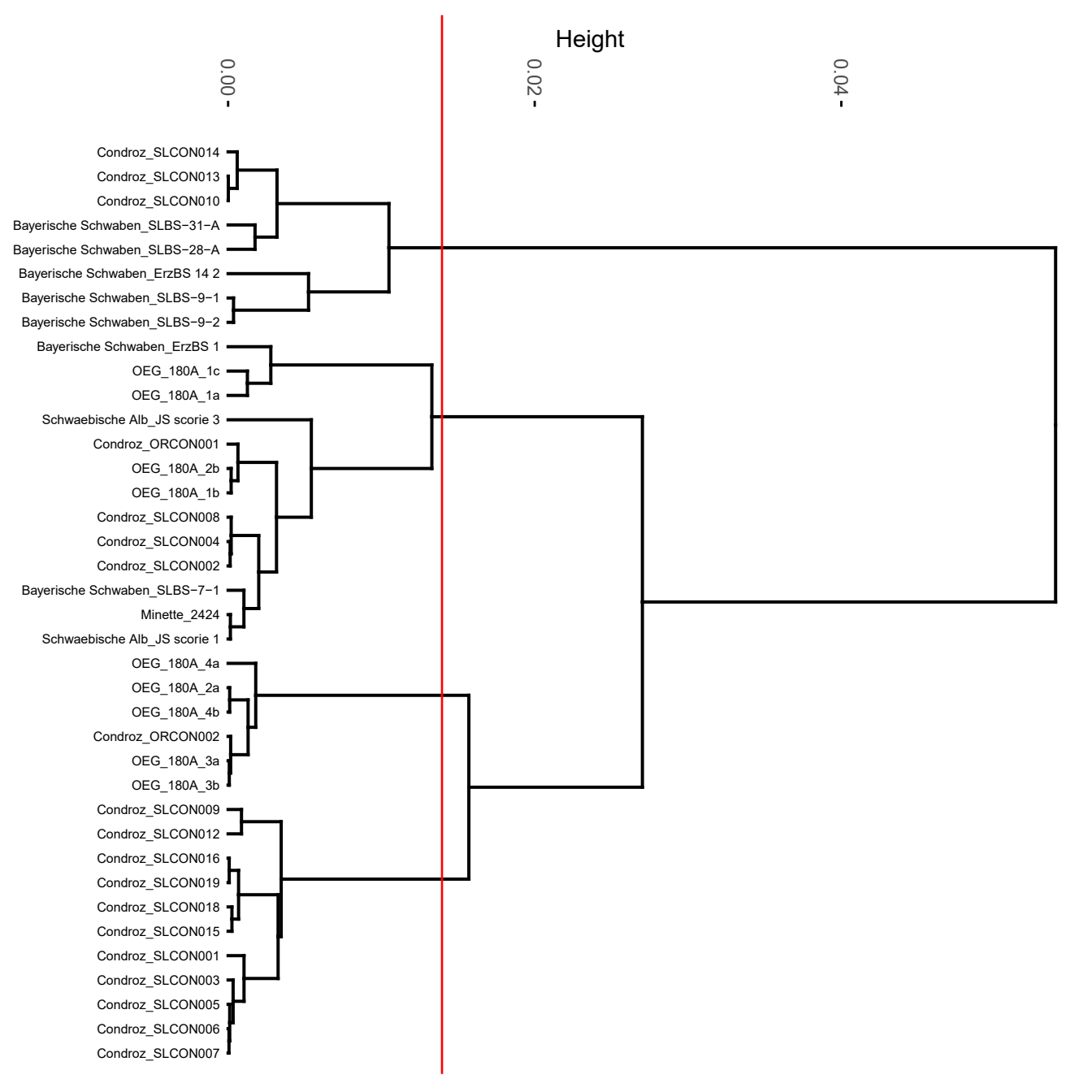

Factor map
Dim2 (11.8%)
Dim1 (70.9%)
0.5
0.0
−0.5
0
1
2
cluster
1
2
3
4
5
6
7
8
9
10

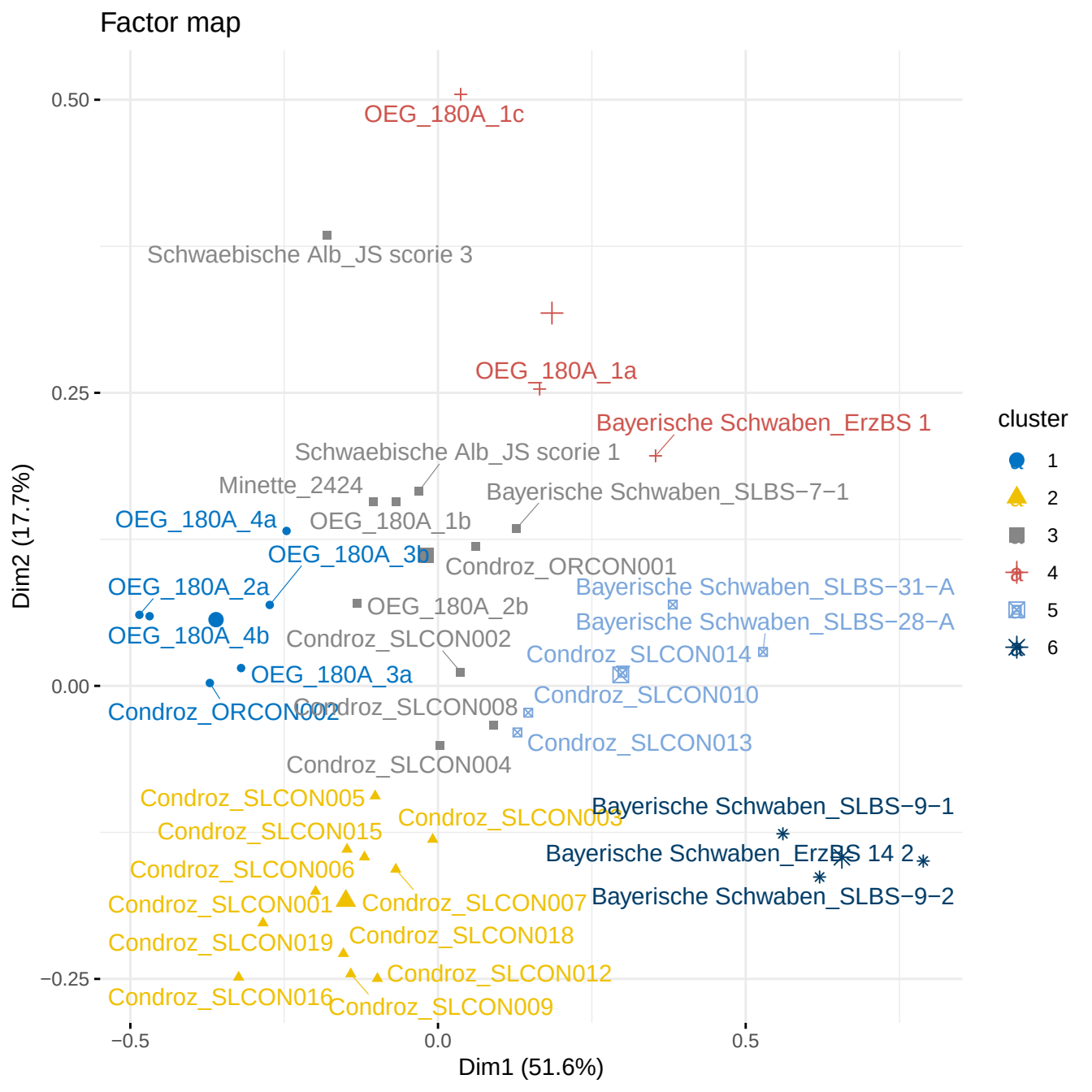

Scree plot
51.6%
17.7%
12%
8.2%
7.4%
1.3%
1.1%
0.4%
0.2%
0.1%
Percentage of explained variances
0
10
20
30
40
50
1
2
3
4
5
6
7
8
9
10
Dimensions


Variables − PCA
Xij_Th
Xij_Ce
Xij_Yb
Xij_Dy
Xij_Gd
Xij_Sm
Xij_Nd
Xij_La
Xij_Y
Xij_Pr
Xij_U
Xij_Eu
contrib
40
30
20
10
0.10
0.05
0.00
−0.05
−0.1
0.0
0.1
0.2
Dim2 (17.7%)
Dim1 (51.6%)

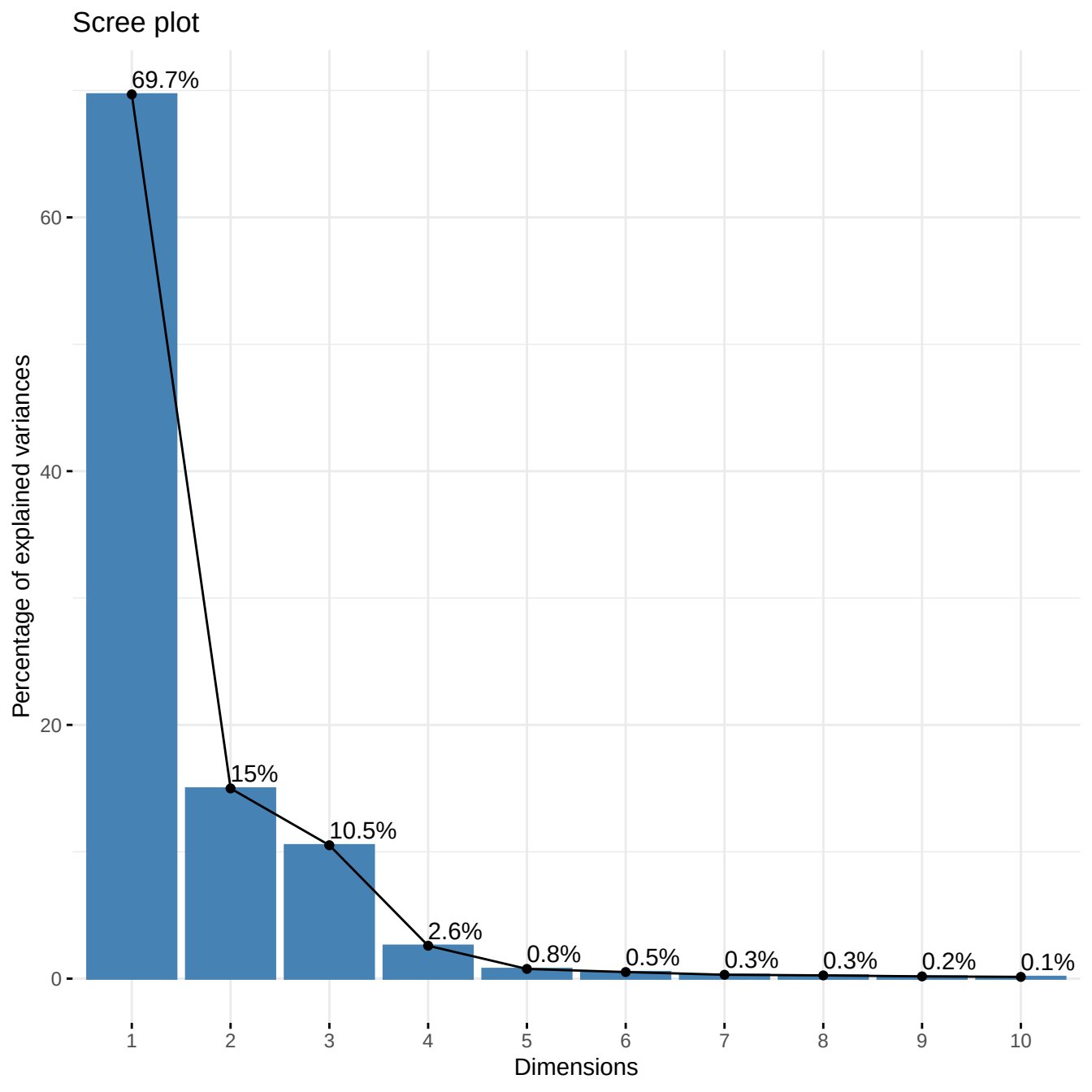

Individuals − PCA
OEG_180A_1c
Schwaebische Alb_JS scorie 3
OEG_180A_1a
Bayerische Schwaben_ErzBS 1
Schwaebische Alb_JS scorie 1
Minette_2424
Bayerische Schwaben_SLBS−7−1
OEG_180A_4a
OEG_180A_1b
OEG_180A_3b
Condroz_ORCON001
OEG_180A_2a
Bayerische Schwaben_SLBS−31−A
OEG_180A_2b
Bayerische Schwaben_SLBS−28−A
OEG_180A_4b
Condroz_SLCON002
Condroz_SLCON014
OEG_180A_3a
Condroz_SLCON010
Condroz_ORCON002
Condroz_SLCON008
Condroz_SLCON013
Condroz_SLCON004
Condroz_SLCON005
Bayerische Schwaben_SLBS−9−1
Condroz_SLCON003
Condroz_SLCON015
Bayerische Schwaben_ErzBS 14 2
Condroz_SLCON006
Bayerische Schwaben_SLBS−9−2
Condroz_SLCON001
Condroz_SLCON007
Condroz_SLCON018
Condroz_SLCON019
Condroz_SLCON012
Condroz_SLCON016
Condroz_SLCON009
0.50
0.25
0.00
−0.25
−0.5
0.0
0.5
Dim2 (17.7%)
Dim1 (51.6%)
Groupes
Ore
smelting slag
unknown

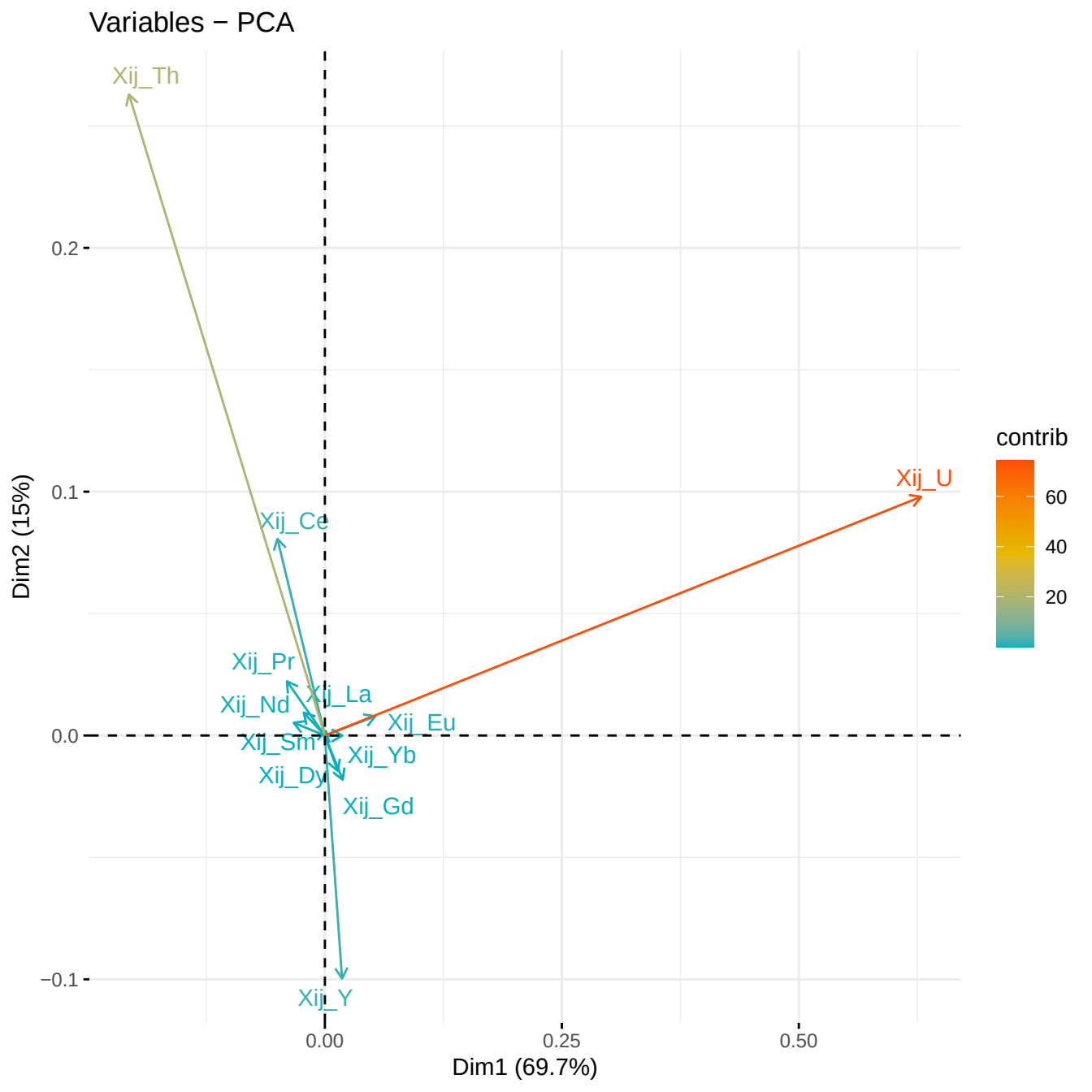

Optimal number of clusters
Gap statistic (k)
0.4
0.3
0.2
1
2
3
4
5
6
7
8
9
10
Number of clusters k

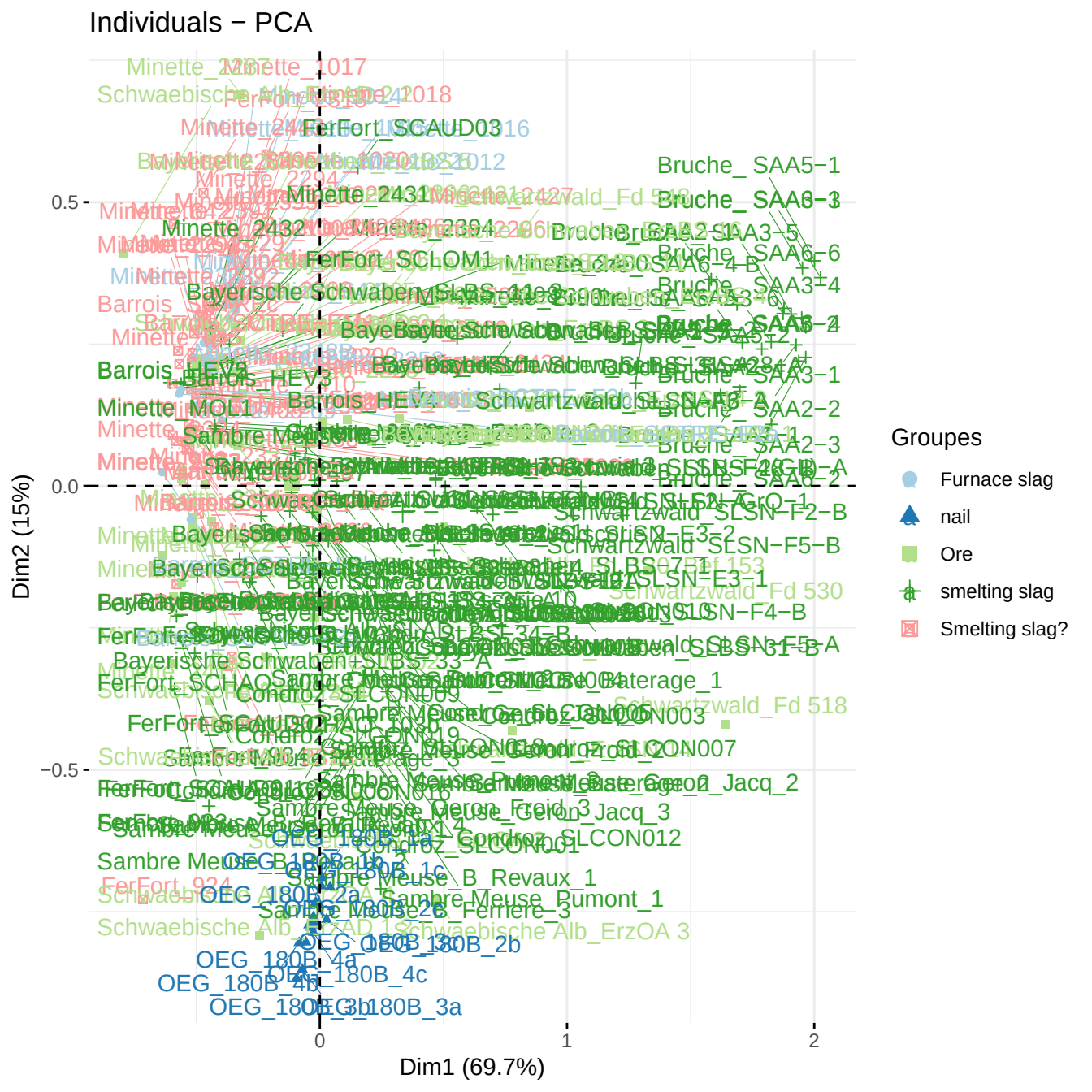

Height
0.00
0.02
0.04
Condroz_SLCON014
Condroz_SLCON013
Condroz_SLCON010
Bayerische Schwaben_SLBS−31−A
Bayerische Schwaben_SLBS−28−A
Bayerische Schwaben_ErzBS 14 2
Bayerische Schwaben_SLBS−9−1
Bayerische Schwaben_SLBS−9−2
Bayerische Schwaben_ErzBS 1
OEG_180A_1c
OEG_180A_1a
Schwaebische Alb_JS scorie 3
Condroz_ORCON001
OEG_180A_2b
OEG_180A_1b
Condroz_SLCON008
Condroz_SLCON004
Condroz_SLCON002
Bayerische Schwaben_SLBS−7−1
Minette_2424
Schwaebische Alb_JS scorie 1
OEG_180A_4a
OEG_180A_2a
OEG_180A_4b
Condroz_ORCON002
OEG_180A_3a
OEG_180A_3b
Condroz_SLCON009
Condroz_SLCON012
Condroz_SLCON016
Condroz_SLCON019
Condroz_SLCON018
Condroz_SLCON015
Condroz_SLCON001
Condroz_SLCON003
Condroz_SLCON005
Condroz_SLCON006
Condroz_SLCON007

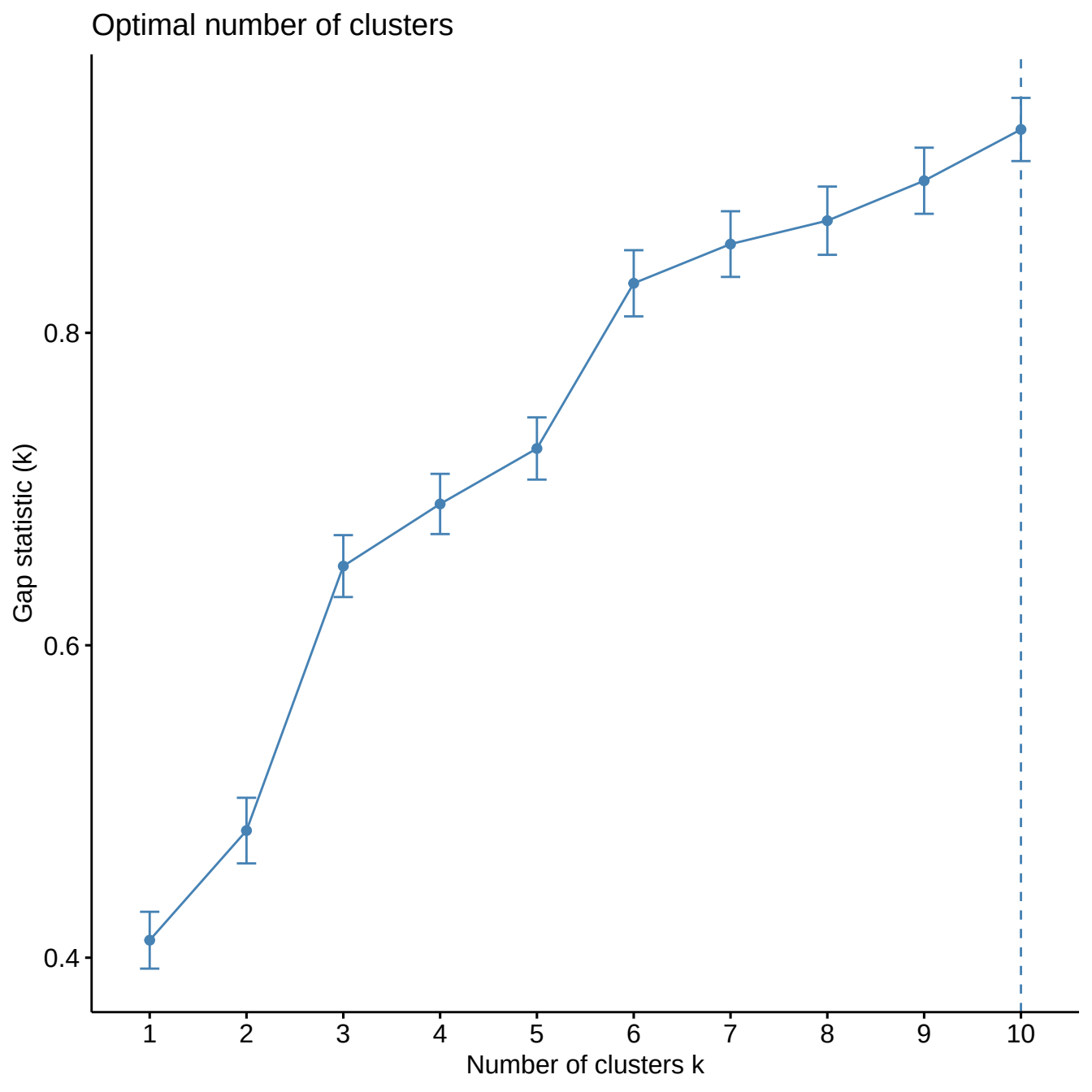

Factor map
0.50
0.25
0.00
−0.25
−0.5
0.0
0.5
Dim2 (17.7%)
Dim1 (51.6%)
cluster
1
2
3
4
5
6
OEG_180A_1c
Schwaebische Alb_JS scorie 3
OEG_180A_1a
Bayerische Schwaben_ErzBS 1
Schwaebische Alb_JS scorie 1
Minette_2424
Bayerische Schwaben_SLBS−7−1
OEG_180A_4a
OEG_180A_1b
OEG_180A_3b
Condroz_ORCON001
OEG_180A_2a
Bayerische Schwaben_SLBS−31−A
OEG_180A_2b
Bayerische Schwaben_SLBS−28−A
OEG_180A_4b
Condroz_SLCON002
Condroz_SLCON014
OEG_180A_3a
Condroz_SLCON010
Condroz_ORCON002
Condroz_SLCON008
Condroz_SLCON013
Condroz_SLCON004
Condroz_SLCON005
Bayerische Schwaben_SLBS−9−1
Condroz_SLCON003
Condroz_SLCON015
Bayerische Schwaben_ErzBS 14 2
Condroz_SLCON006
Condroz_SLCON001
Condroz_SLCON007
Bayerische Schwaben_SLBS−9−2
Condroz_SLCON019
Condroz_SLCON018
Condroz_SLCON012
Condroz_SLCON016
Condroz_SLCON009

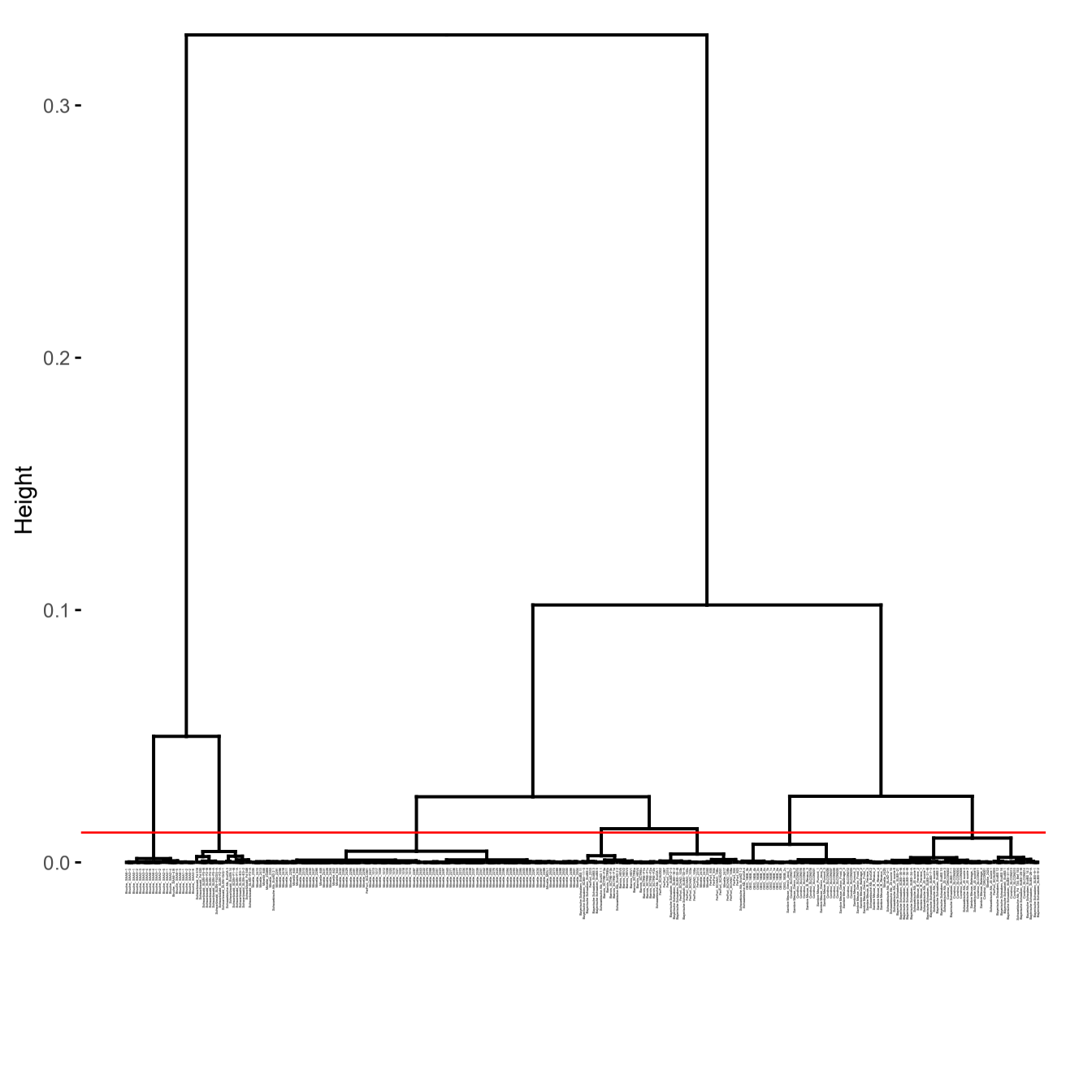
OEG 180B

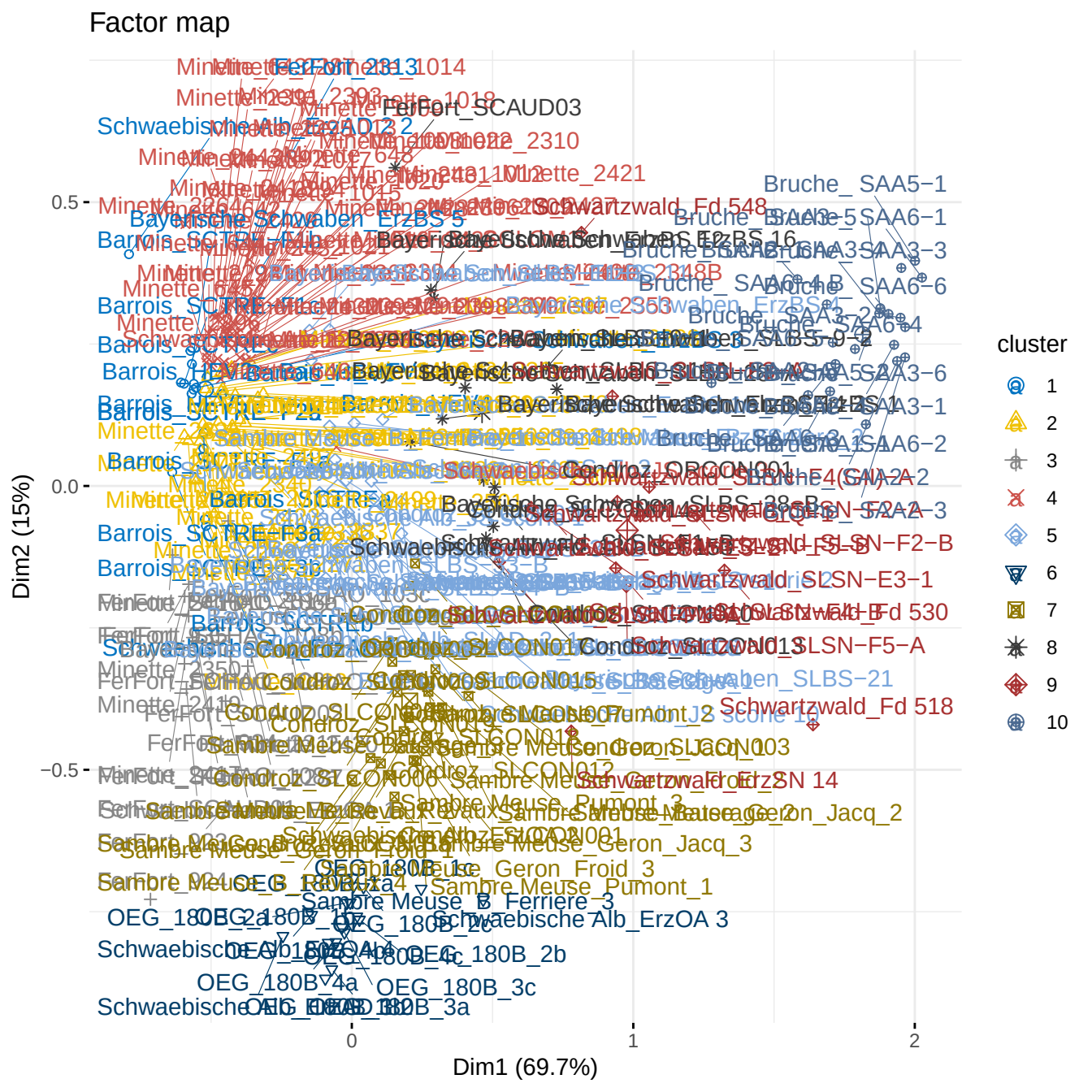

Scree plot
69.7%
15%
10.5%
2.6%
0.8%
0.5%
0.3%
0.3%
0.2%
0.1%
Percentage of explained variances
0
20
40
60
1
2
3
4
5
6
7
8
9
10
Dimensions

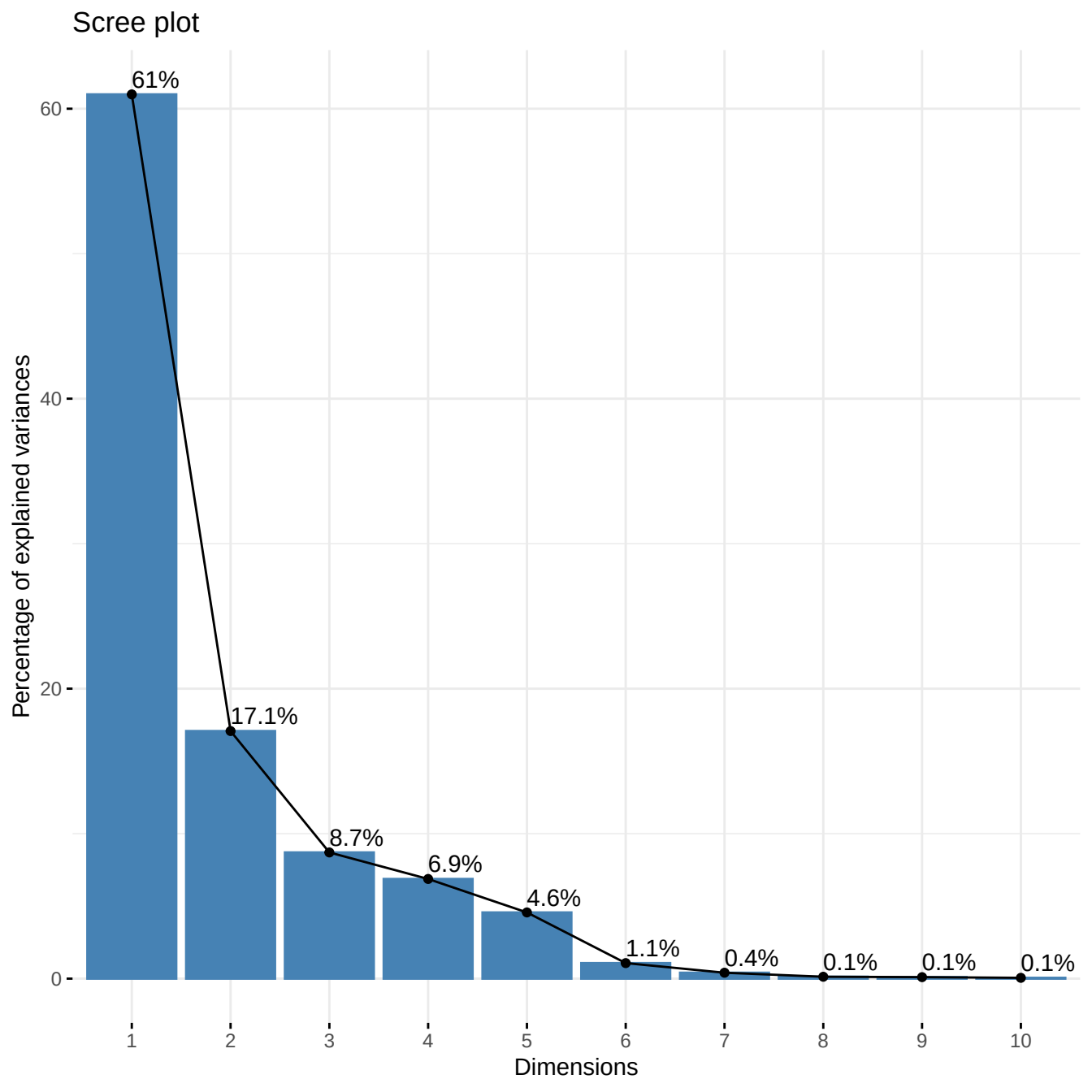

Variables − PCA
Xij_Th
Xij_U
Xij_Ce
Xij_Pr
Xij_La
Xij_Nd
Xij_Eu
Xij_Sm
Xij_Yb
Xij_Dy
Xij_Gd
Xij_Y
contrib
60
40
20
0.2
0.1
0.0
−0.1
Dim2 (15%)
0.00
0.25
0.50
Dim1 (69.7%)

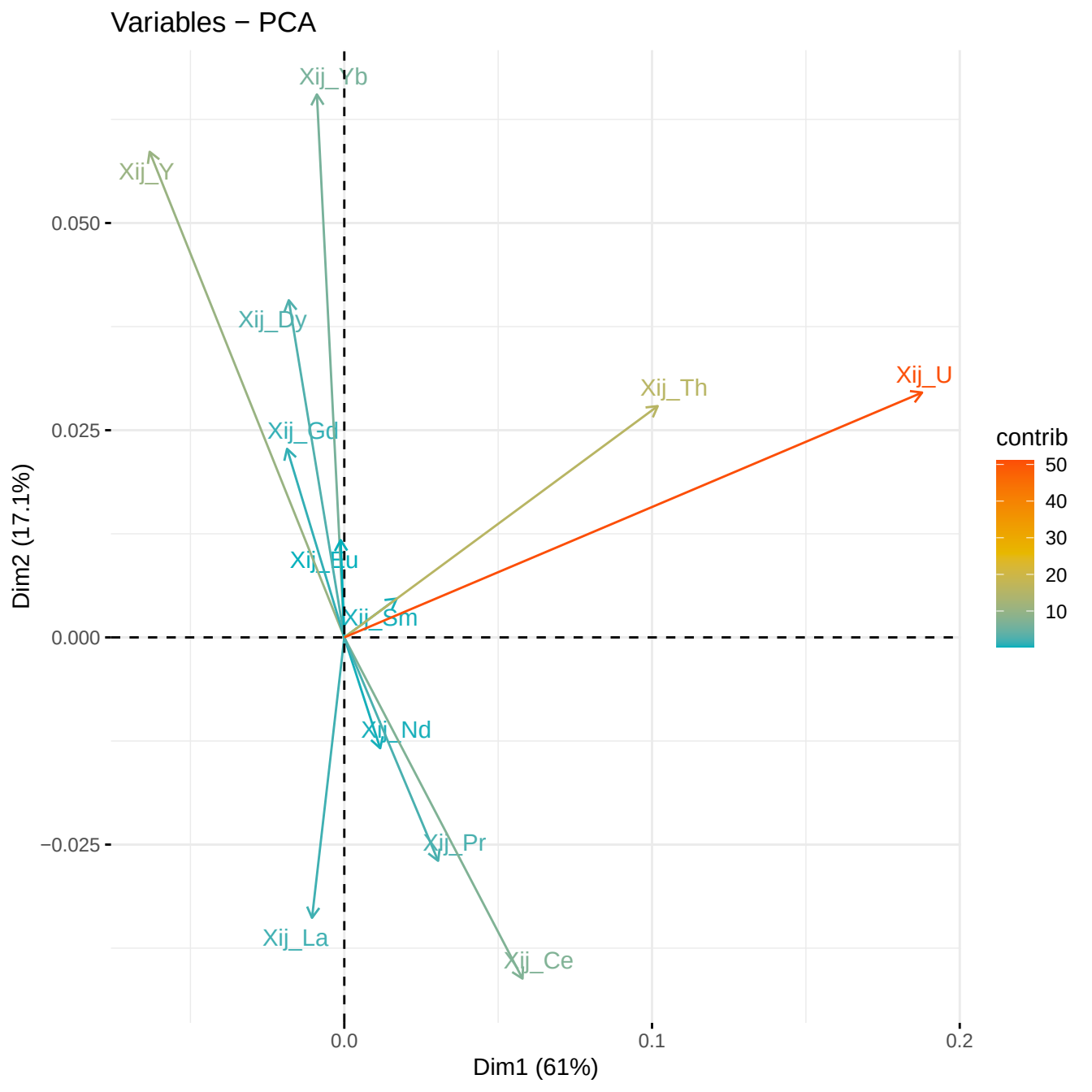

Individuals − PCA
Dim2 (15%)
Dim1 (69.7%)
0.5
0.0
−0.5
0
1
2
Groupes
Furnace slag
nail
Ore
smelting slag
Smelting slag?
Minette_1017
FerFort_SCAUD03
Minette_2431
Minette_2432
Minette_2394
FerFort_SCLOM1
Bayerische Schwaben_SLBS_41e8
Barrois_HEV3
Barrois_HEV4
Minette_MOL1
Sambre Meuse_Pumont_1
Sambre Meuse_B_Revaux_1
Sambre Meuse_Ferriere_3
OEG_180B_1a
OEG_180B_1b
OEG_180B_1c
OEG_180B_2a
OEG_180B_2b
OEG_180B_3a
OEG_180B_3b
OEG_180B_4a
OEG_180B_4b
OEG_180B_4c
Schwaebische Alb_ErzOA 3
Bruche_SAA5−1
Bruche_SAA6−3
Bruche_SAA6−6
Bruche_SAA3−4
Bruche_SAA3−1
Bruche_SAA2−2
Bruche_SAA2−3
Schwartzwald_SLSN−F2−B
Schwartzwald_SLSN−F5−B
Schwartzwald_SLSN−E3−1
Schwartzwald_Fd 530
Schwartzwald_SLSN−F4−B
Schwartzwald_Fd 518
Sambre Meuse_Meuse_Geron_Jacq_3
Sambre Meuse_Meuse_Geron_Jacq_2
Condroz_SLCON012
Condroz_SLCON001
Condroz_SLCON007
Condroz_SLCON003

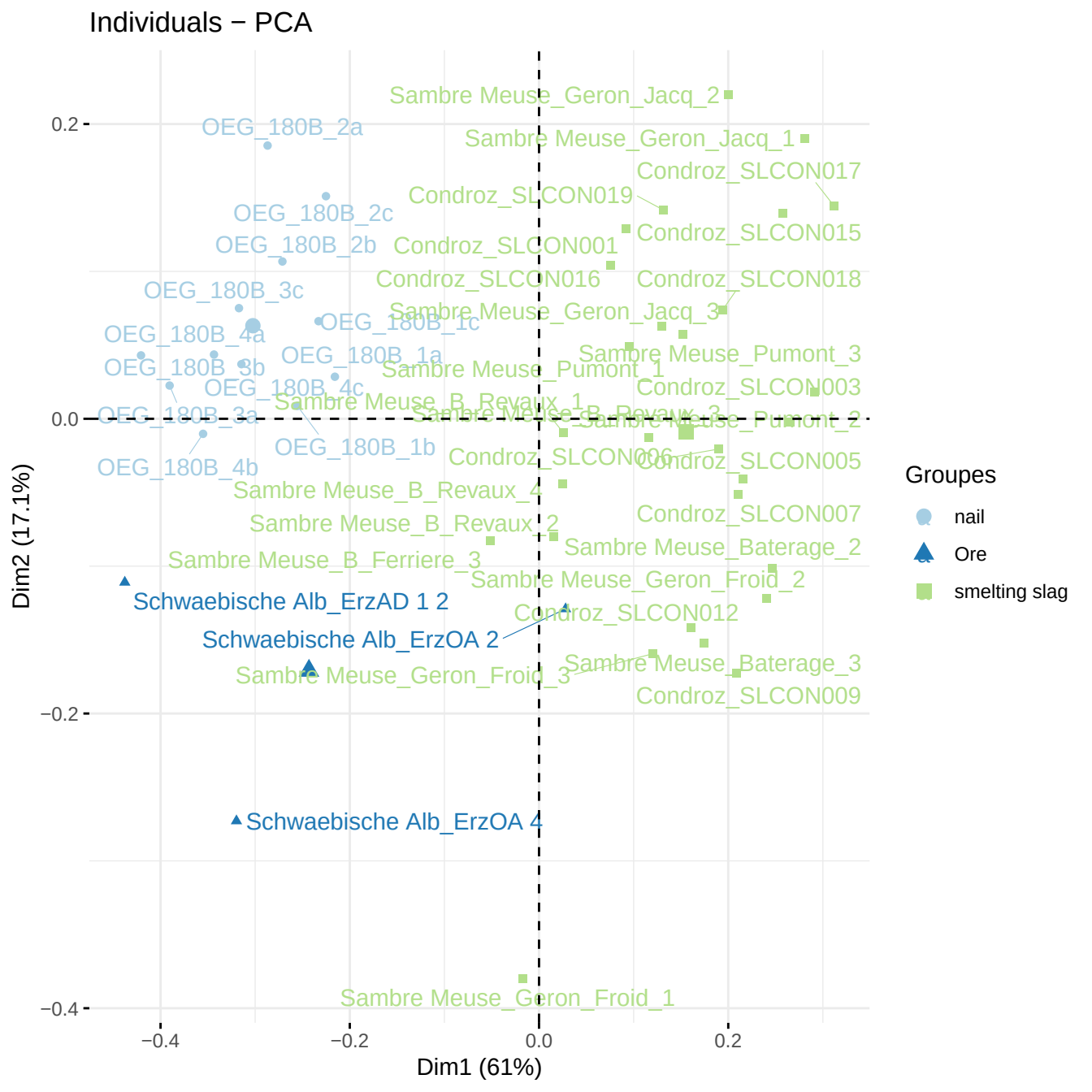

Optimal number of clusters
Gap statistic (k)
0.8
0.6
0.4
1
2
3
4
5
6
7
8
9
10
Number of clusters k

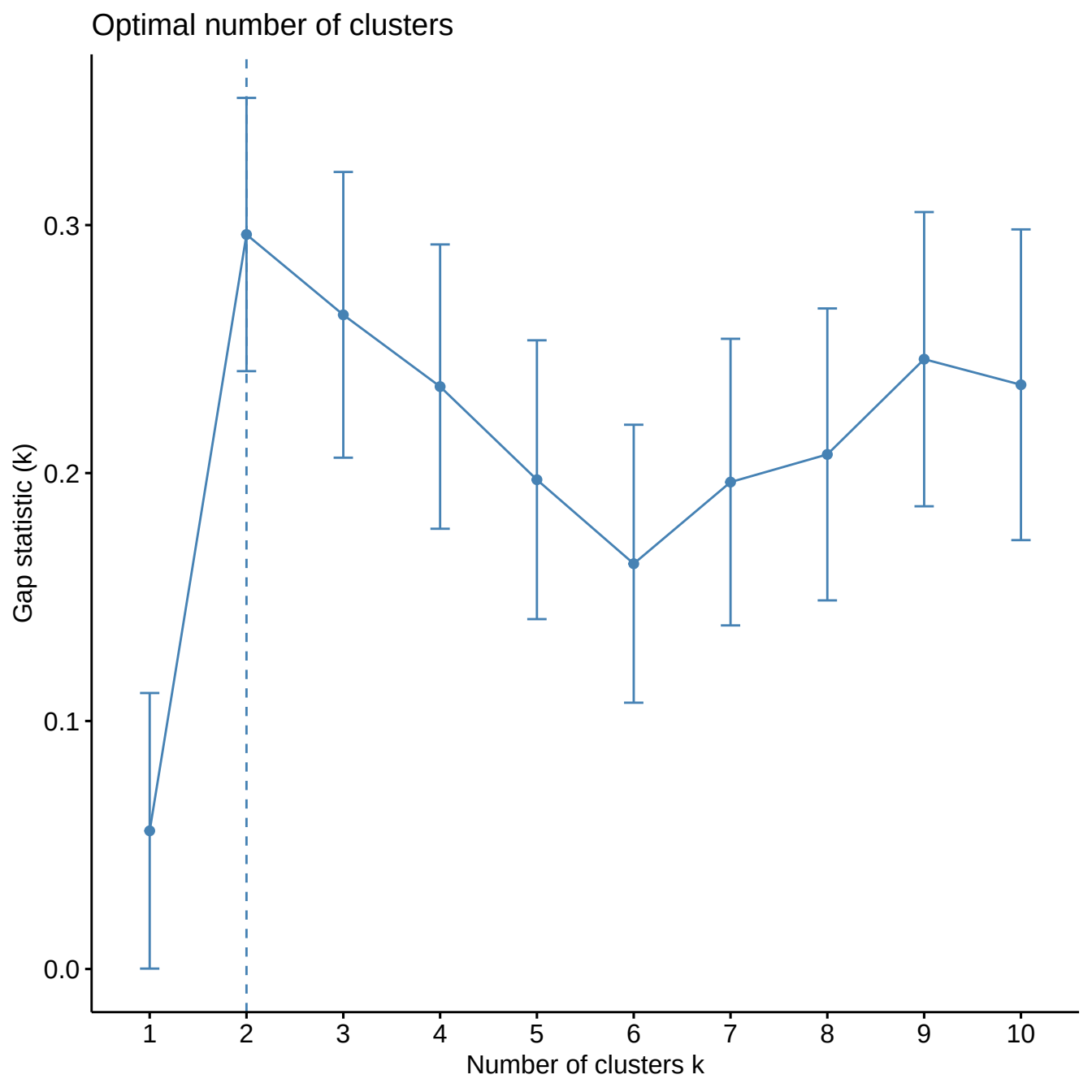

Height
0.3
0.2
0.1
0.0

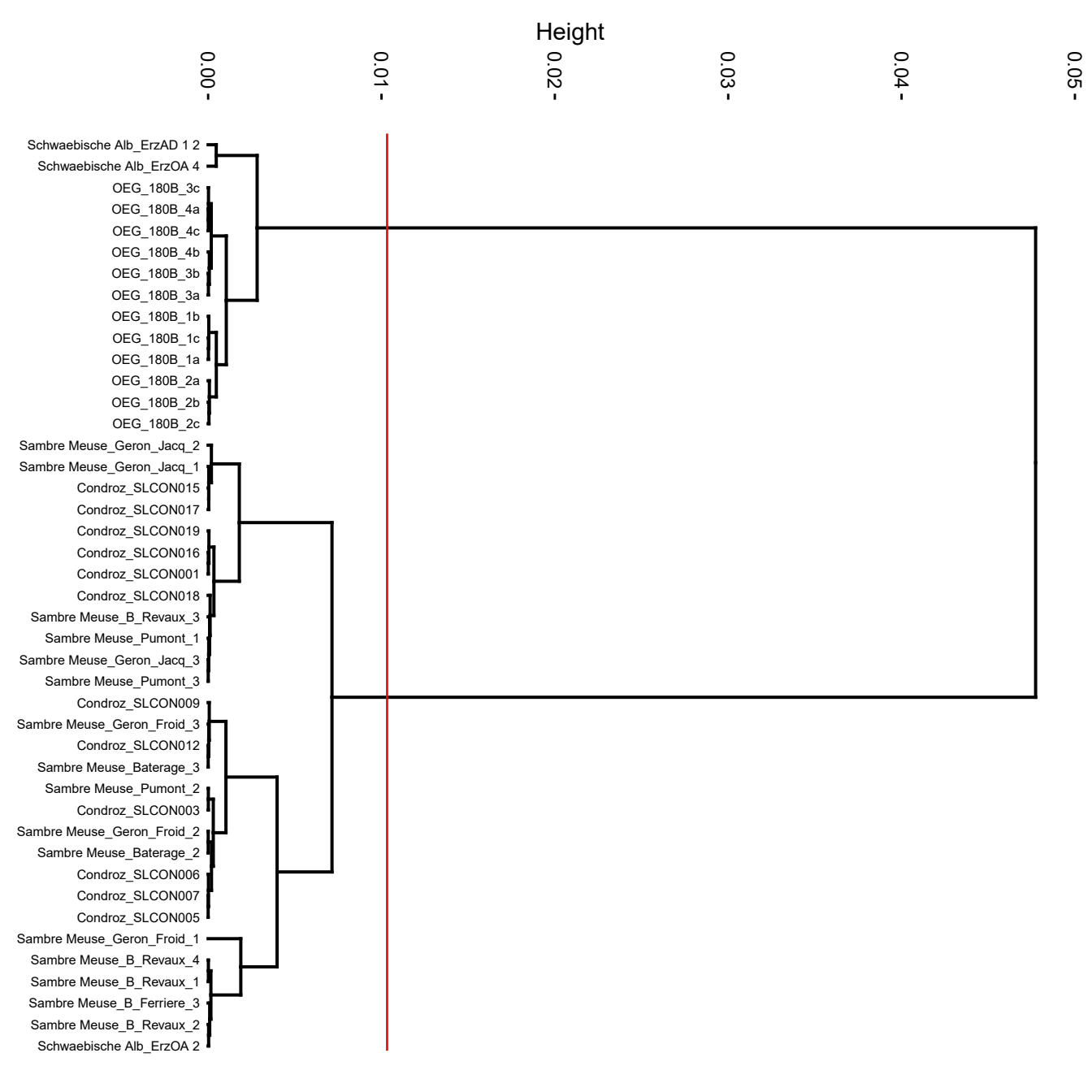

Factor map
Dim2 (15%)
Dim1 (69.7%)
0.5
0.0
−0.5
0
1
2
cluster
1
2
3
4
5
6
7
8
9
10

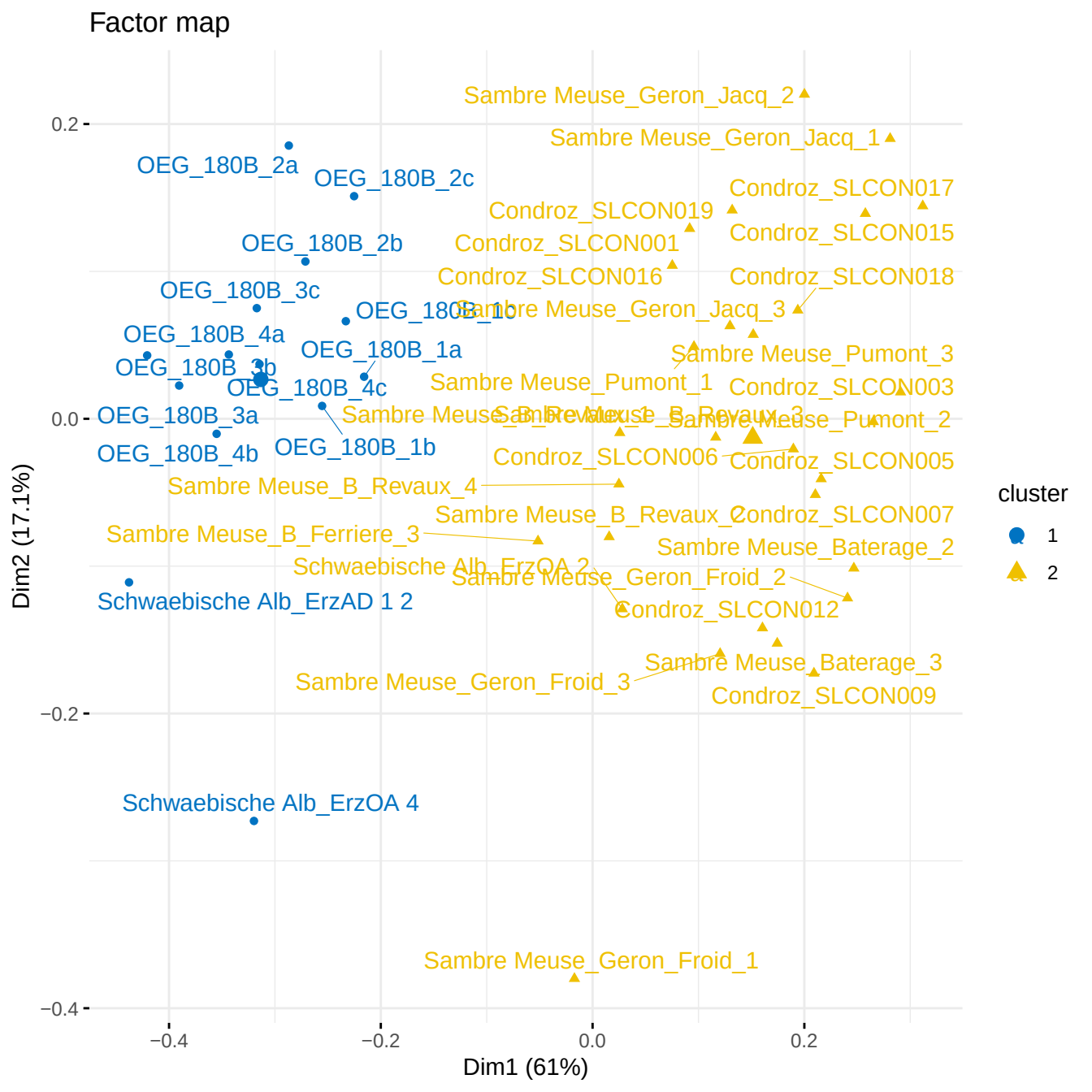

Scree plot
61%
17.1%
8.7%
6.9%
4.6%
1.1%
0.4%
0.1%
0.1%
0.1%
60
40
20
0
Percentage of explained variances
1
2
3
4
5
6
7
8
9
10
Dimensions


Variables − PCA
Xij_Yb
Xij_Y
Xij_Dy
Xij_Th
Xij_U
Xij_Gd
Xij_Eu
Xij_Sm
Xij_Nd
Xij_Pr
Xij_La
Xij_Ce
0.050
0.025
0.000
−0.025
Dim2 (17.1%)
0.0
0.1
0.2
Dim1 (61%)
contrib
50
40
30
20
10

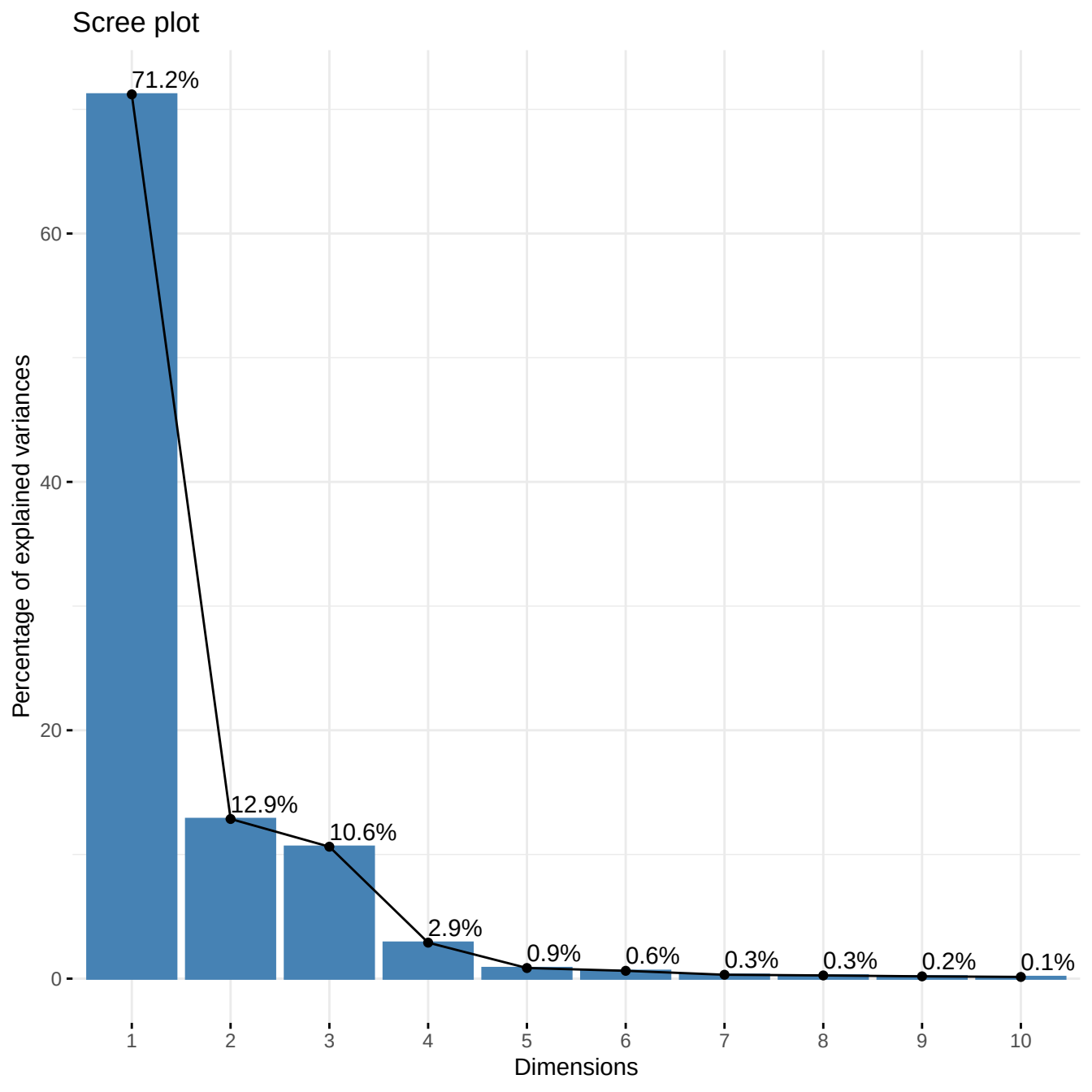

Individuals − PCA
Sambre Meuse_Geron_Jacq_2
OEG_180B_2a
Sambre Meuse_Geron_Jacq_1
Condroz_SLCON017
Condroz_SLCON019
OEG_180B_2c
Condroz_SLCON015
OEG_180B_2b
Condroz_SLCON001
Condroz_SLCON016
Condroz_SLCON018
OEG_180B_3c
Sambre Meuse_Geron_Jacq_3
OEG_180B_1c
OEG_180B_4a
OEG_180B_1a
Sambre Meuse_Pumont_3
OEG_180B_3b
Sambre Meuse_Pumont_1
OEG_180B_4c
Condroz_SLCON003
Sambre Meuse_B_Revaux_1
OEG_180B_3a
Sambre Meuse_B_Revaux_3
Sambre Meuse_Pumont_2
OEG_180B_1b
Condroz_SLCON006
Condroz_SLCON005
OEG_180B_4b
Sambre Meuse_B_Revaux_4
Condroz_SLCON007
Sambre Meuse_B_Revaux_2
Sambre Meuse_Baterage_2
Sambre Meuse_B_Ferriere_3
Sambre Meuse_Geron_Froid_2
Schwaebische Alb_ErzAD 1 2
Condroz_SLCON012
Schwaebische Alb_ErzOA 2
Sambre Meuse_Baterage_3
Sambre Meuse_Geron_Froid_3
Condroz_SLCON009
Schwaebische Alb_ErzOA 4
Sambre Meuse_Geron_Froid_1
0.2
0.0
−0.2
−0.4
Dim2 (17.1%)
−0.4
−0.2
0.0
0.2
Dim1 (61%)
Groupes
nail
Ore
smelting slag

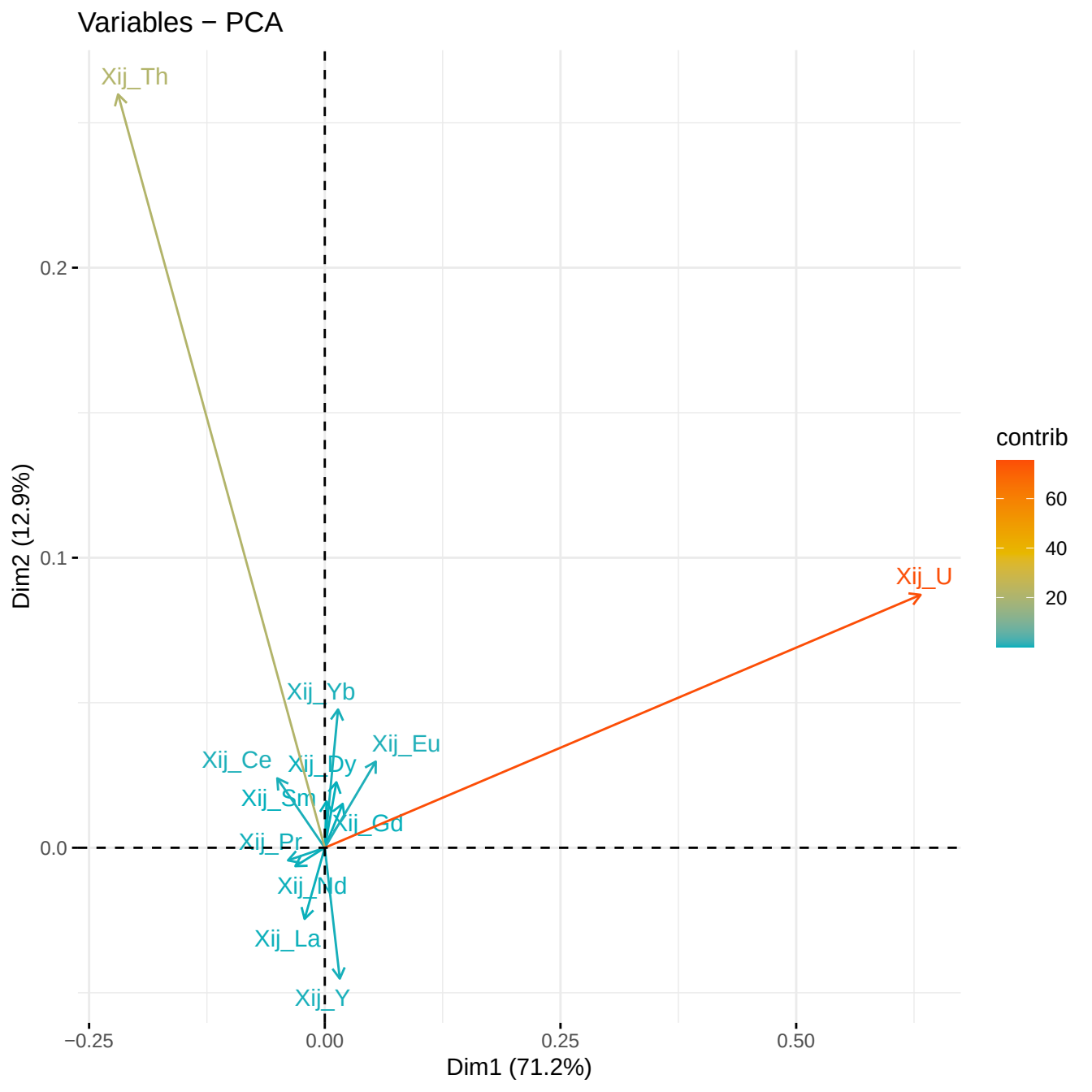

Optimal number of clusters
Gap statistic (k)
0.0
0.1
0.2
0.3
1
2
3
4
5
6
7
8
9
10
Number of clusters k


Height
0.00
0.01
0.02
0.03
0.04
0.05
Schwaebische Alb_ErzAD 1 2
Schwaebische Alb_ErzOA 4
OEG_180B_3c
OEG_180B_4a
OEG_180B_4c
OEG_180B_4b
OEG_180B_3b
OEG_180B_3a
OEG_180B_1b
OEG_180B_1c
OEG_180B_1a
OEG_180B_2a
OEG_180B_2b
OEG_180B_2c
Sambre Meuse_Geron_Jacq_2
Sambre Meuse_Geron_Jacq_1
Condroz_SLCON015
Condroz_SLCON017
Condroz_SLCON019
Condroz_SLCON016
Condroz_SLCON001
Condroz_SLCON018
Sambre Meuse_B_Revaux_3
Sambre Meuse_Pumont_1
Sambre Meuse_Geron_Jacq_3
Sambre Meuse_Pumont_3
Condroz_SLCON009
Sambre Meuse_Geron_Froid_3
Condroz_SLCON012
Sambre Meuse_Baterage_3
Sambre Meuse_Pumont_2
Condroz_SLCON003
Sambre Meuse_Geron_Froid_2
Sambre Meuse_Baterage_2
Condroz_SLCON006
Condroz_SLCON007
Condroz_SLCON005
Sambre Meuse_Geron_Froid_1
Sambre Meuse_B_Revaux_4
Sambre Meuse_B_Revaux_1
Sambre Meuse_B_Ferriere_3
Sambre Meuse_B_Revaux_2
Schwaebische Alb_ErzOA 2

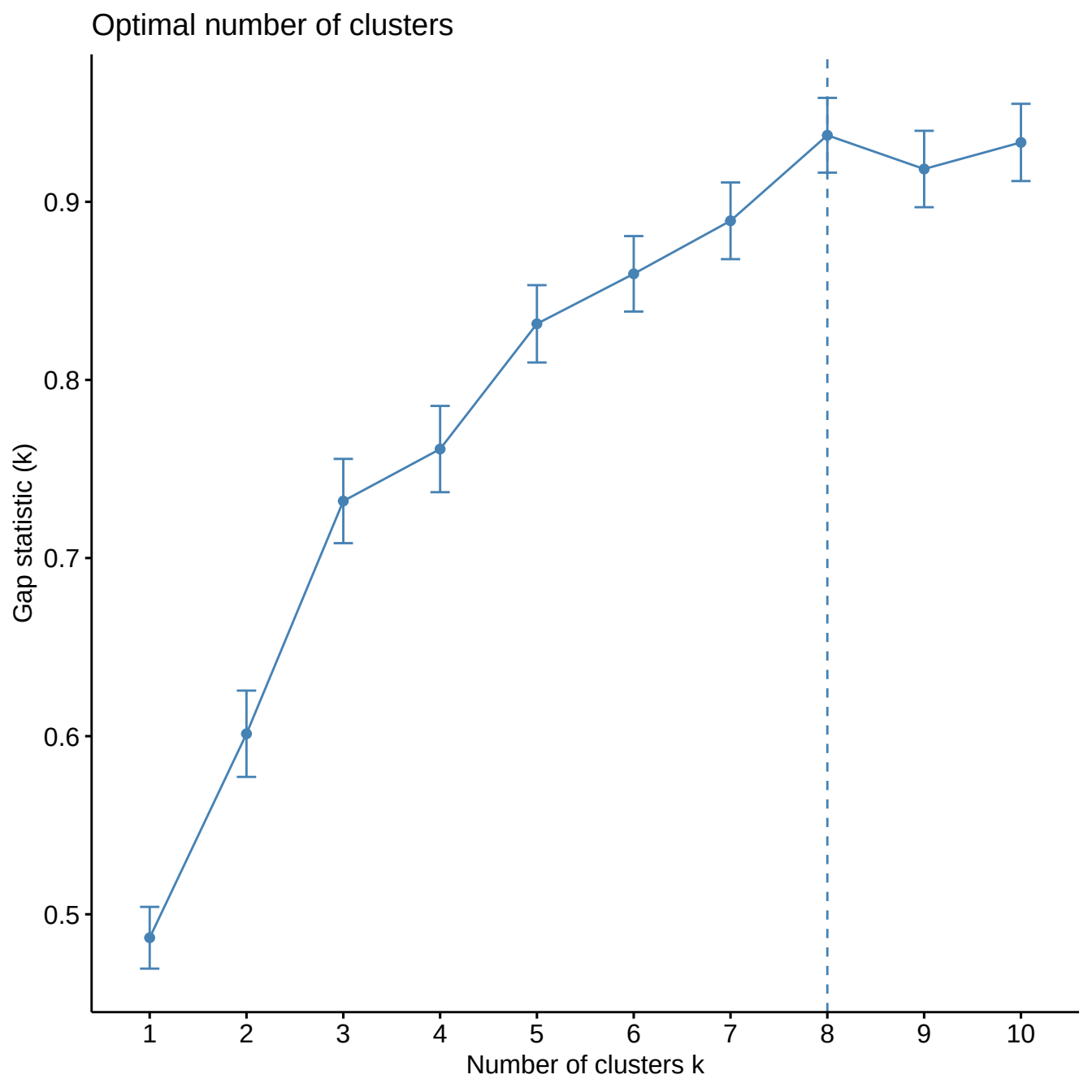

Factor map
Sambre Meuse_Geron_Jacq_2
Sambre Meuse_Geron_Jacq_1
OEG_180B_2a
OEG_180B_2c
Condroz_SLCON017
Condroz_SLCON019
Condroz_SLCON015
OEG_180B_2b
Condroz_SLCON001
Condroz_SLCON016
Condroz_SLCON018
OEG_180B_3c
Sambre Meuse_Geron_Jacq_3
OEG_180B_1c
OEG_180B_4a
OEG_180B_1a
Sambre Meuse_Pumont_3
OEG_180B_3b
Sambre Meuse_Pumont_1
Condroz_SLCON003
OEG_180B_4c
OEG_180B_3a
Sambre Meuse_B_Revaux_1
Sambre Meuse_Pumont_2
OEG_180B_4b
OEG_180B_1b
Condroz_SLCON006
Condroz_SLCON005
Sambre Meuse_B_Revaux_4
Sambre Meuse_B_Revaux_2
Condroz_SLCON007
Sambre Meuse_B_Ferriere_3
Sambre Meuse_Baterage_2
Schwaebische Alb_ErzOA 2
Sambre Meuse_Geron_Froid_2
Schwaebische Alb_ErzAD 1 2
Condroz_SLCON012
Sambre Meuse_Baterage_3
Sambre Meuse_Geron_Froid_3
Condroz_SLCON009
Schwaebische Alb_ErzOA 4
Sambre Meuse_Geron_Froid_1
0.2
0.0
−0.2
−0.4
Dim2 (17.1%)
−0.4
−0.2
0.0
0.2
Dim1 (61%)
cluster
1
2

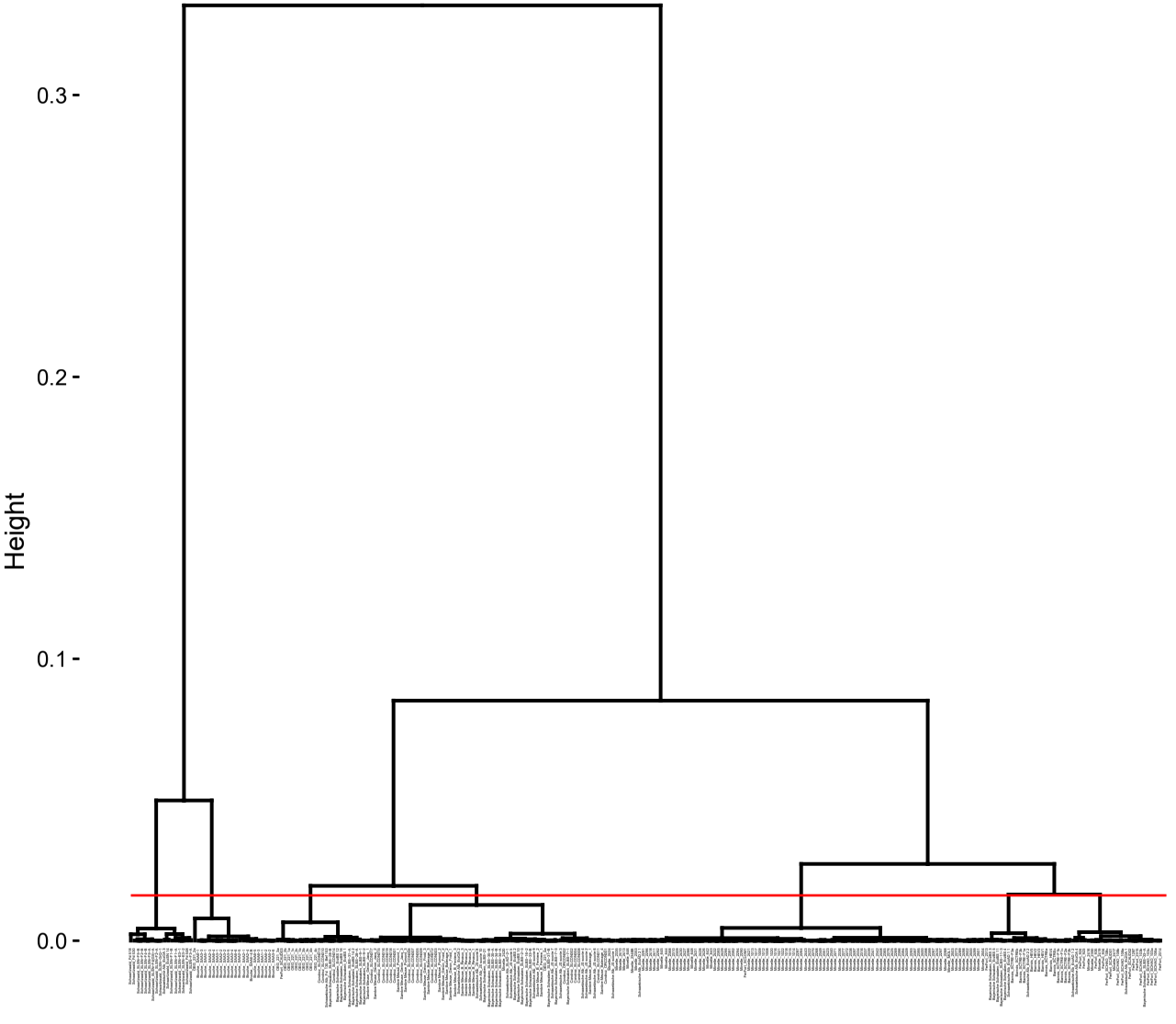
OEG 221

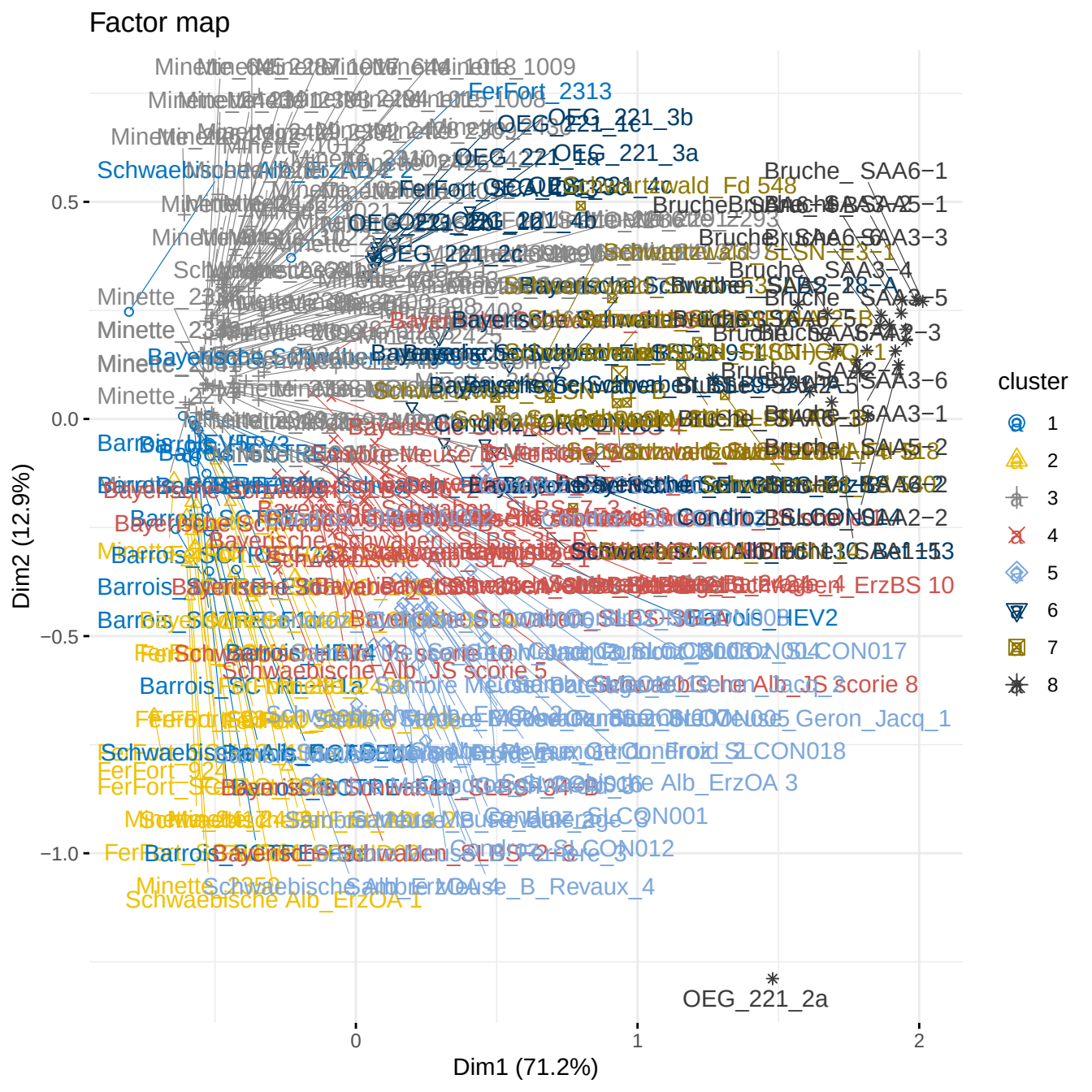

Scree plot
71.2%
12.9%
10.6%
2.9%
0.9%
0.6%
0.3%
0.3%
0.2%
0.1%
Percentage of explained variances
0
20
40
60
1
2
3
4
5
6
7
8
9
10
Dimensions

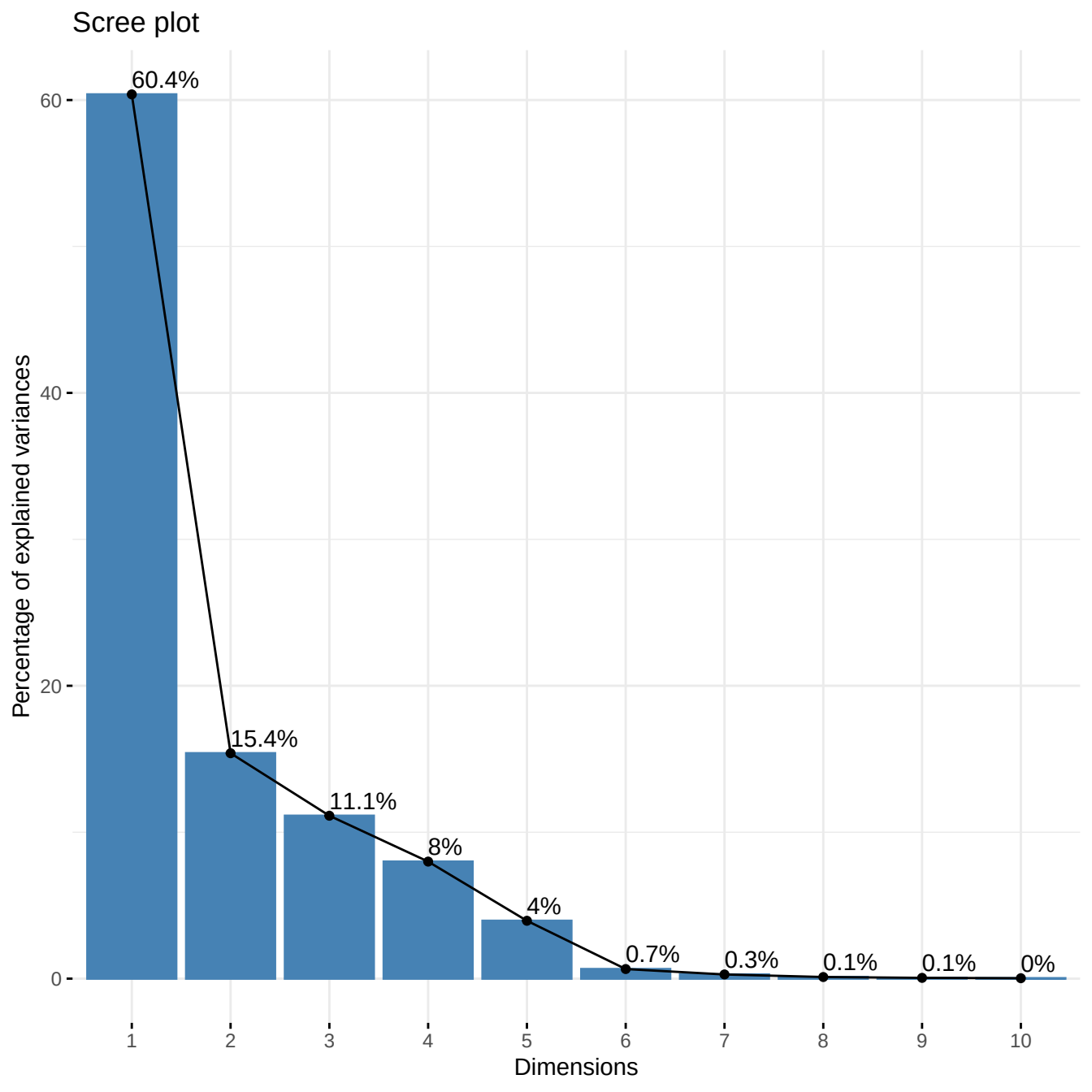

Variables − PCA
Xij_Th
Xij_U
Xij_Yb
Xij_Eu
Xij_Ce
Xij_Dy
Xij_Sm
Xij_Gd
Xij_Pr
Xij_Nd
Xij_La
Xij_Y
contrib
60
40
20
0.2
0.1
0.0
−0.25
0.00
0.25
0.50
Dim2 (12.9%)
Dim1 (71.2%)

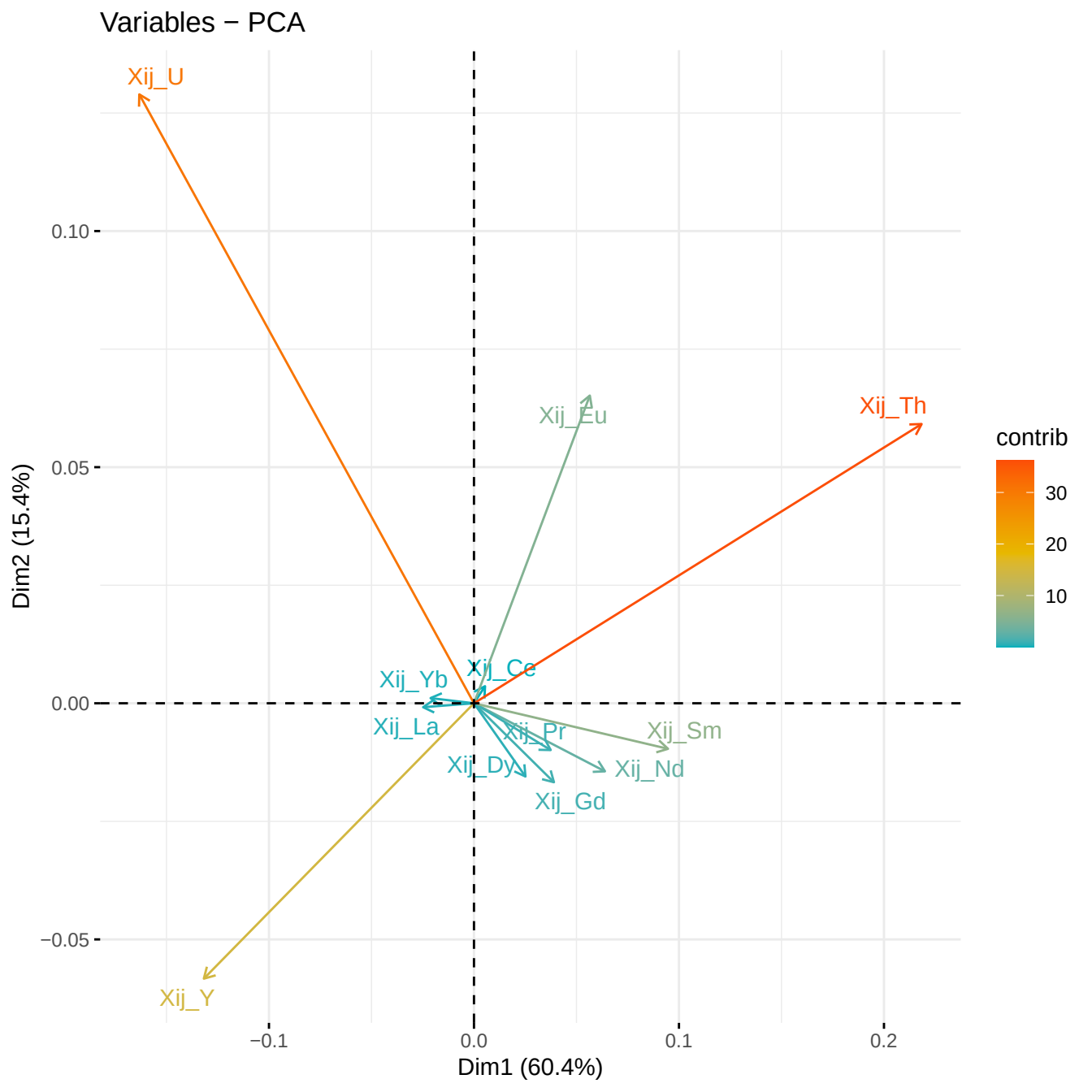
Individuals − PCA
Dim1 (71.2%)
Dim2 (12.9%)
Groupes
Furnace slag
nail
Ore
smelting slag
Smelting slag?
0.5
0.0
−0.5
−1.0
0
1
2
Bruche_ SAA6−1
Bruche_ SAA5−1
Bruche_ SAA3−3
Minette_2421
Minette_2400
FerFort_SCHAUD01
Bayerische Schwaben_SLBS−33−A
Schwaebische Alb_JS scorie 5
Schwaebische Alb_ErzAD 1 2
OEG_221_2a

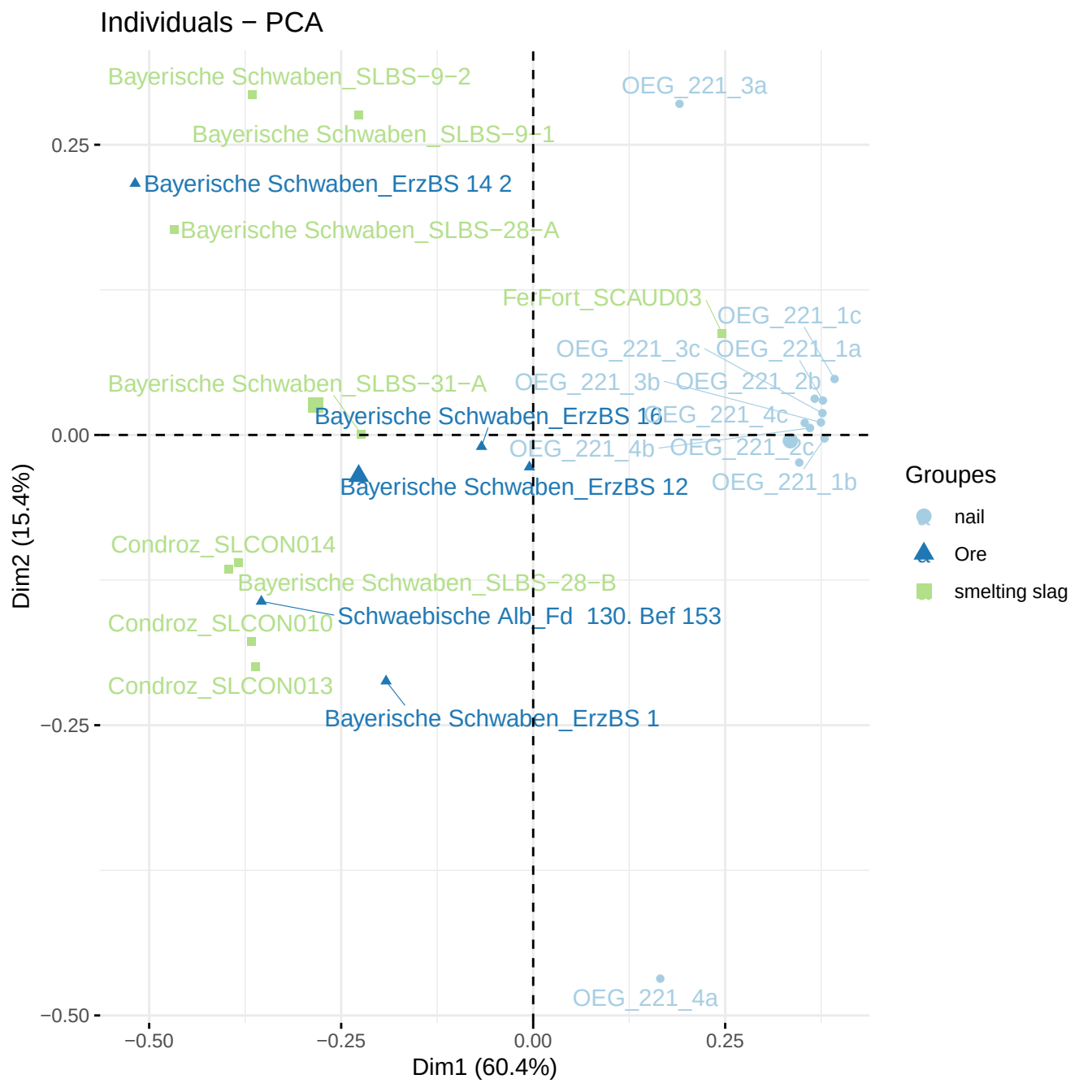

Optimal number of clusters
Gap statistic (k)
0.5
0.6
0.7
0.8
0.9
1
2
3
4
5
6
7
8
9
10
Number of clusters k

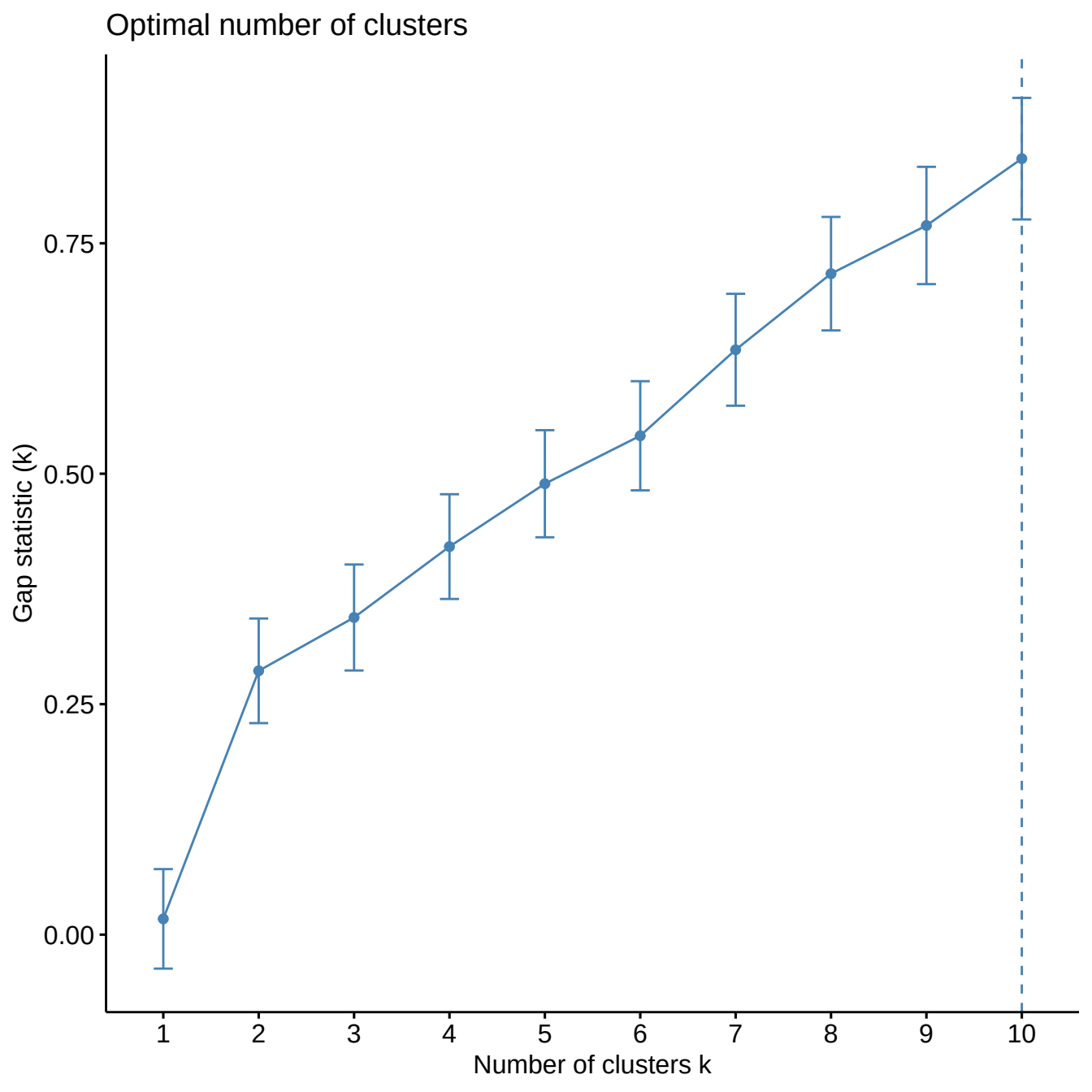

Height
0.3
0.2
0.1
0.0

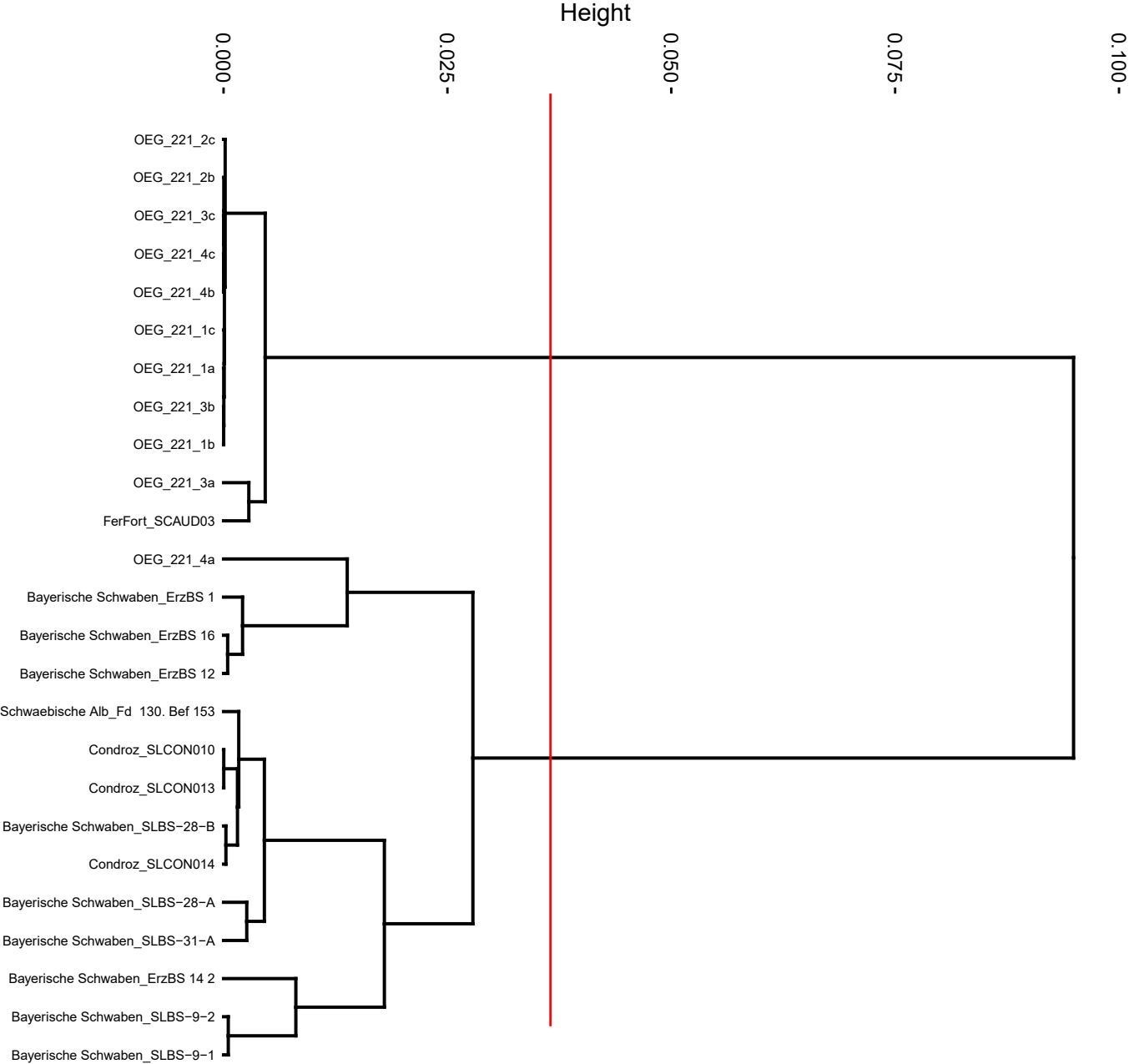

Factor map
Dim2 (12.9%)
Dim1 (71.2%)
cluster
1
2
3
4
5
6
7
8
OEG_221_2a

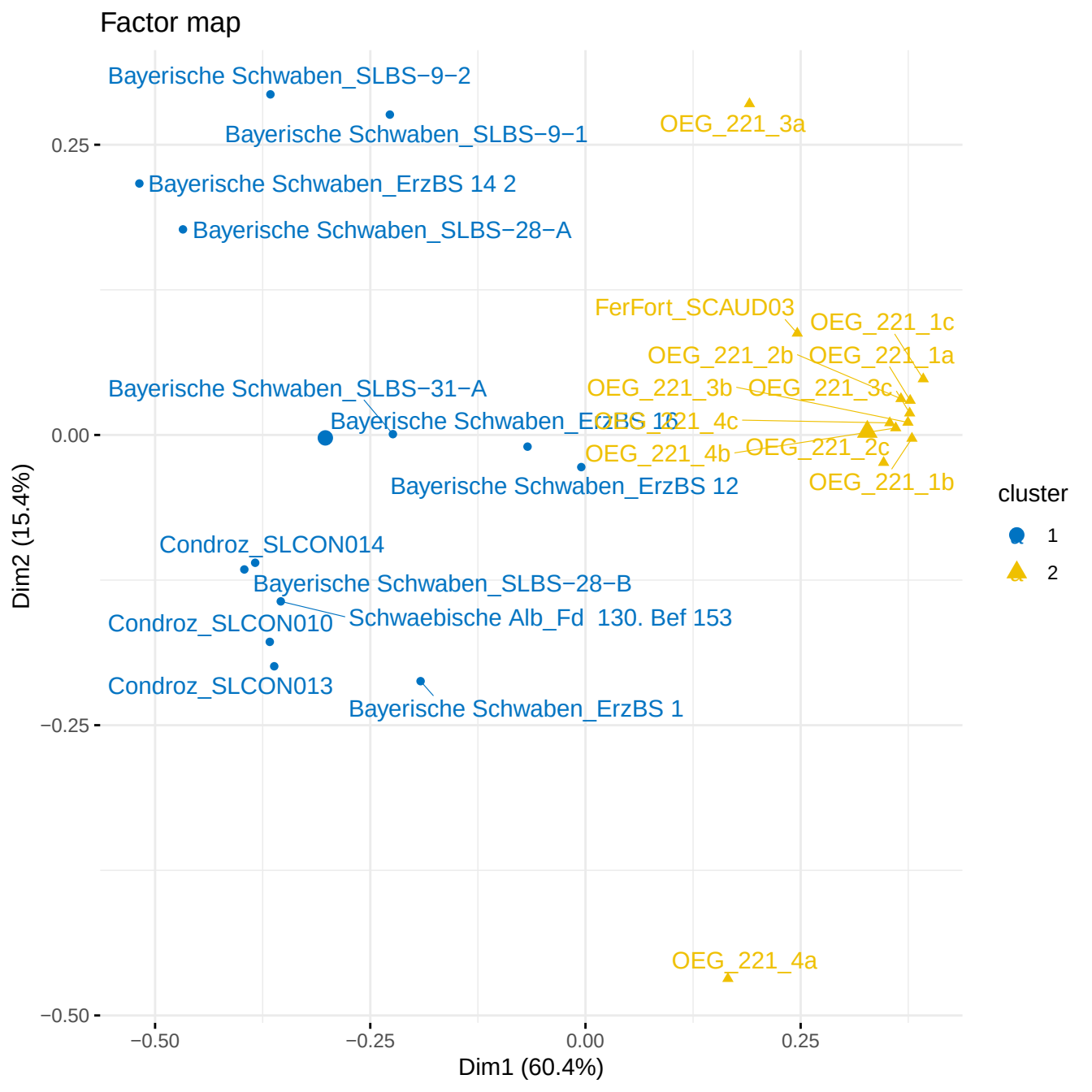

Scree plot
60.4%
15.4%
11.1%
8%
4%
0.7%
0.3%
0.1%
0.1%
0%
60
40
20
0
Percentage of explained variances
1
2
3
4
5
6
7
8
9
10
Dimensions


Variables − PCA
Xij_U
Xij_Th
Xij_Eu
Xij_Ce
Xij_Yb
Xij_La
Xij_Pr
Xij_Sm
Xij_Dy
Xij_Nd
Xij_Gd
Xij_Y
contrib
30
20
10
0.10
0.05
0.00
−0.05
−0.1
0.0
0.1
0.2
Dim2 (15.4%)
Dim1 (60.4%)

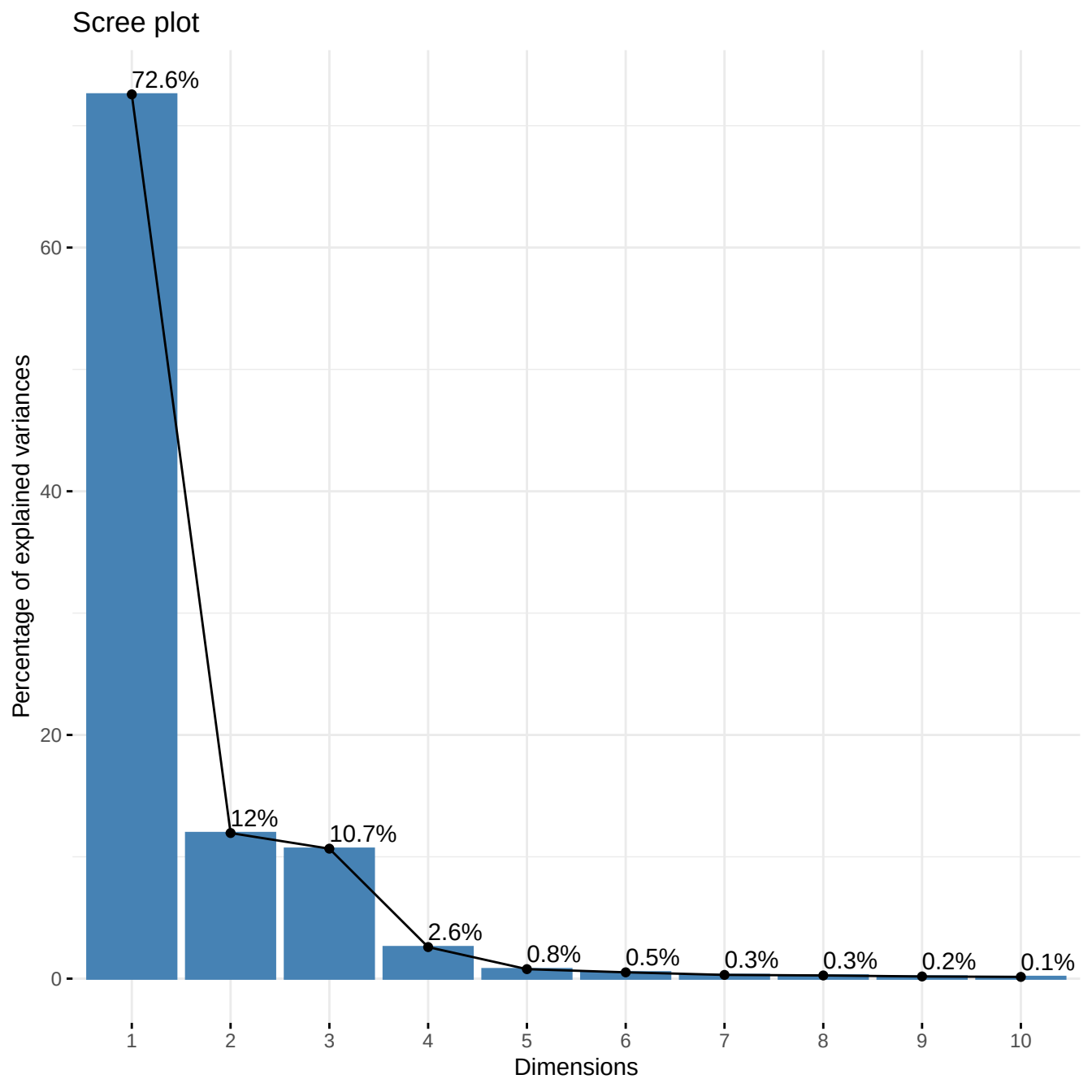

Individuals − PCA
Bayerische Schwaben_SLBS−9−2
OEG_221_3a
Bayerische Schwaben_SLBS−9−1
Bayerische Schwaben_ErzBS 14 2
Bayerische Schwaben_SLBS−28−A
Fe−Fort_SCAUD03
OEG_221_1c
OEG_221_3c
OEG_221_1a
Bayerische Schwaben_SLBS−31−A
OEG_221_3b
OEG_221_2b
Bayerische Schwaben_ErzBS 16
OEG_221_4c
OEG_221_4b
OEG_221_2c
Bayerische Schwaben_ErzBS 12
OEG_221_1b
Condroz_SLCON014
Bayerische Schwaben_SLBS−28−B
Schwaebische Alb_Fd 130. Bef 153
Condroz_SLCON010
Condroz_SLCON013
Bayerische Schwaben_ErzBS 1
OEG_221_4a
0.25
0.00
−0.25
−0.50
−0.50
−0.25
0.00
0.25
Dim2 (15.4%)
Dim1 (60.4%)
Groupes
nail
Ore
smelting slag

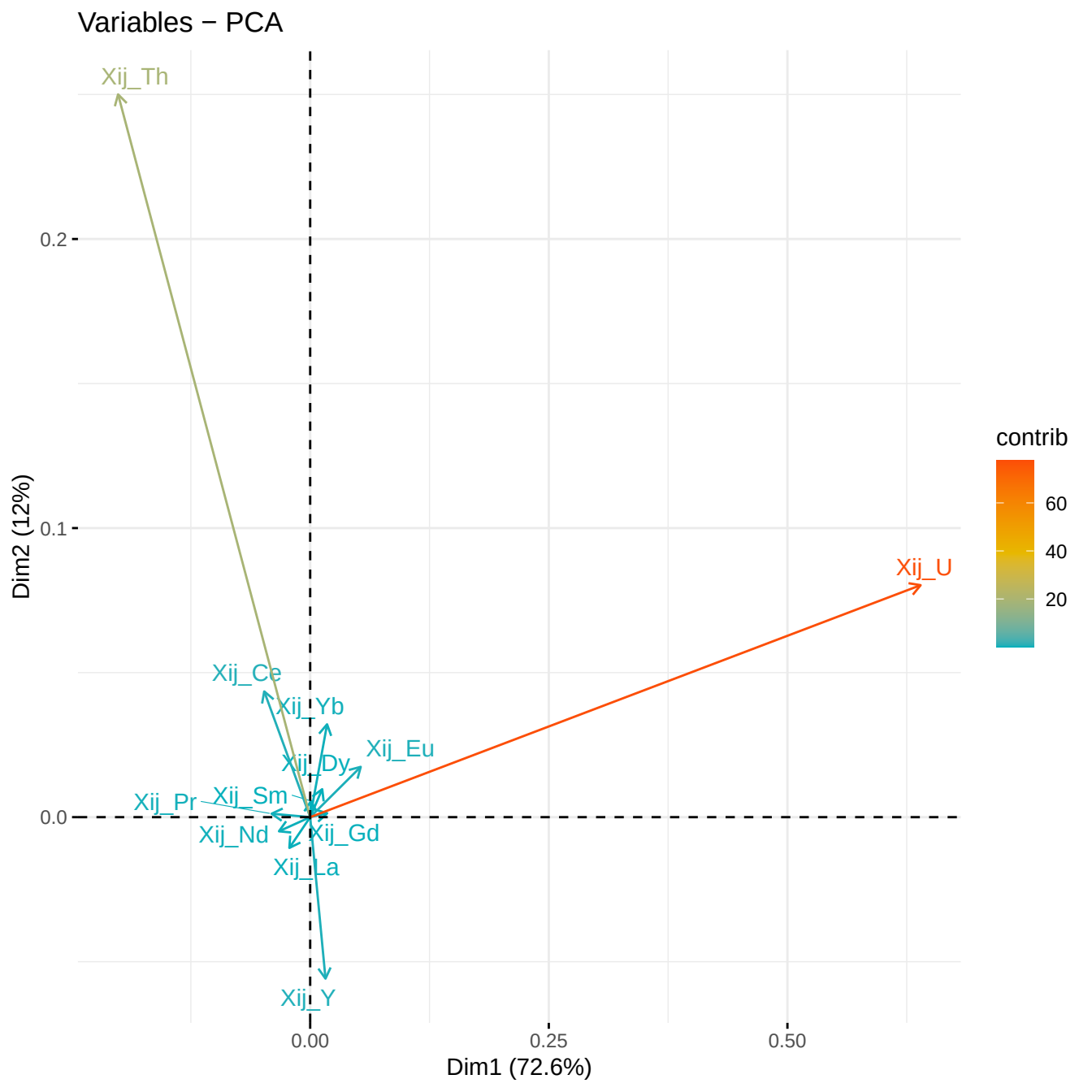

Optimal number of clusters
Gap statistic (k)
0.00
0.25
0.50
0.75
1
2
3
4
5
6
7
8
9
10
Number of clusters k

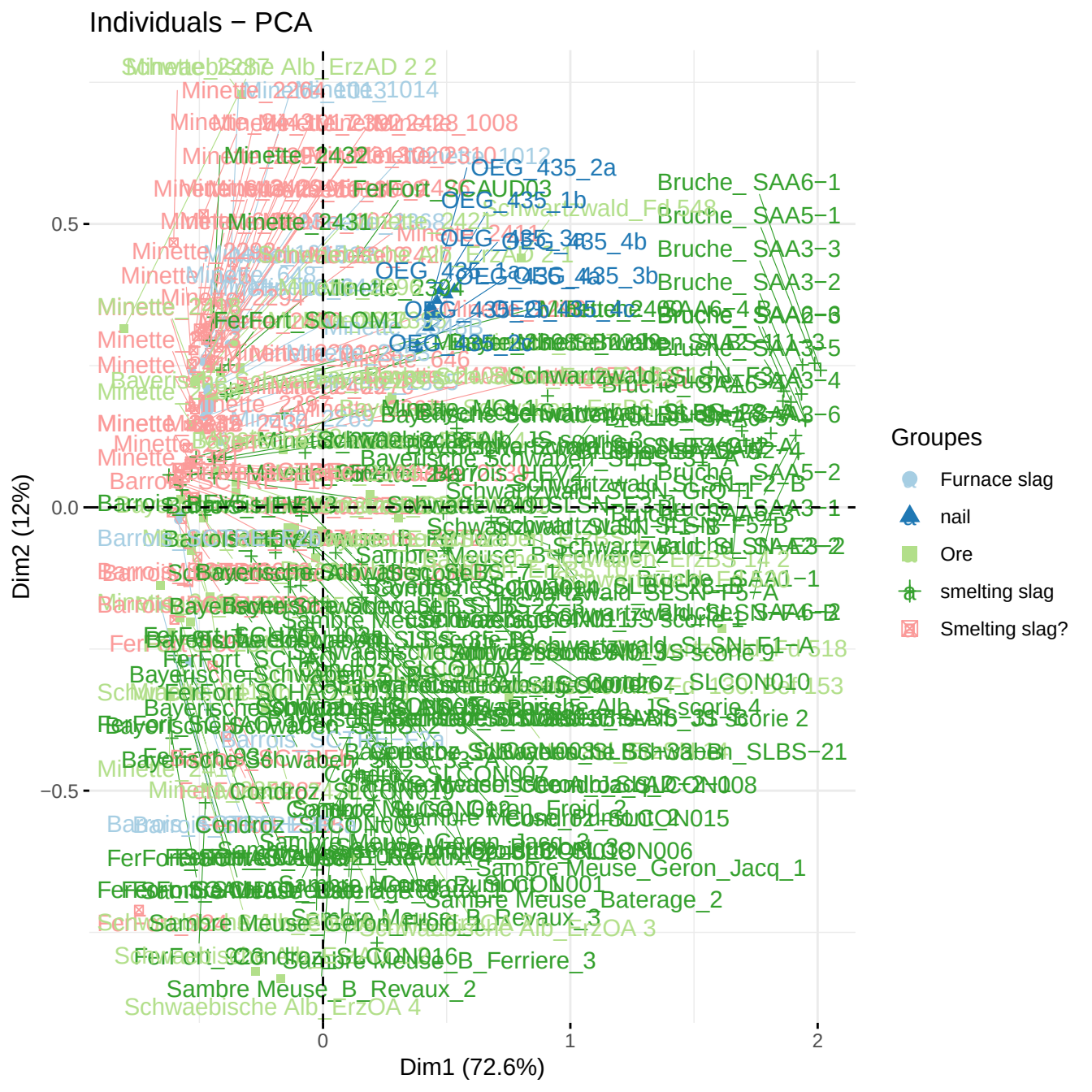

Height
0.000
0.025
0.050
0.075
0.100
OEG_221_2c
OEG_221_2b
OEG_221_3c
OEG_221_4c
OEG_221_4b
OEG_221_1c
OEG_221_1a
OEG_221_3b
OEG_221_1b
OEG_221_3a
FerFort_SCAUD03
OEG_221_4a
Bayerische Schwaben_ErzBS 1
Bayerische Schwaben_ErzBS 16
Bayerische Schwaben_ErzBS 12
Schwaebische Alb_Fd 130. Bef 153
Condroz_SLCON010
Condroz_SLCON013
Bayerische Schwaben_SLBS−28−B
Condroz_SLCON014
Bayerische Schwaben_SLBS−28−A
Bayerische Schwaben_SLBS−31−A
Bayerische Schwaben_ErzBS 14 2
Bayerische Schwaben_SLBS−9−2
Bayerische Schwaben_SLBS−9−1

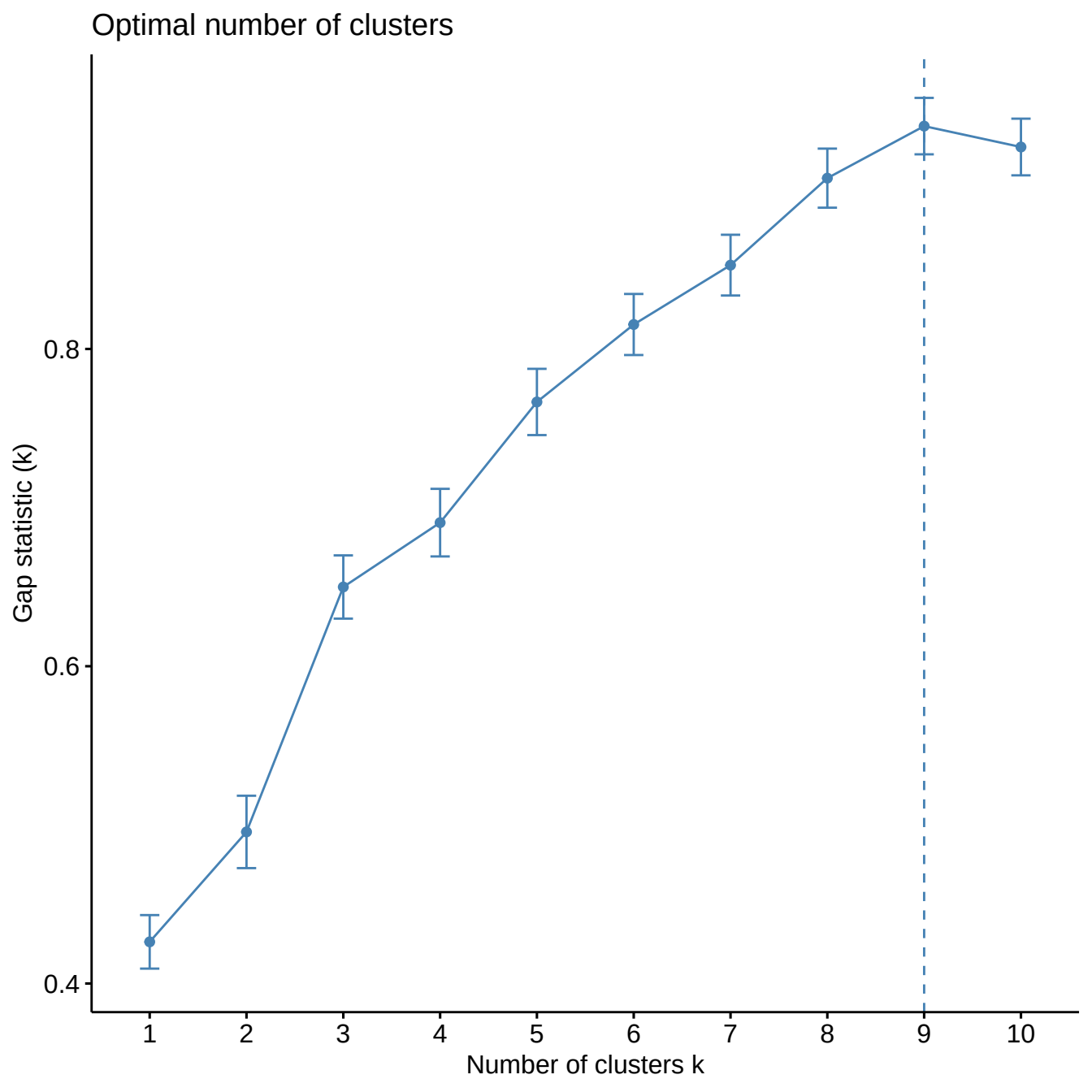

Factor map
Bayerische Schwaben_SLBS−9−2
Bayerische Schwaben_SLBS−9−1
OEG_221_3a
Bayerische Schwaben_ErzBS 14 2
Bayerische Schwaben_SLBS−28−A
FerFort_SCAUD03
OEG_221_1c
OEG_221_2b
OEG_221_1a
Bayerische Schwaben_SLBS−31−A
OEG_221_3b
OEG_221_3c
Bayerische Schwaben_ErzBS 15
OEG_221_4c
OEG_221_4b
OEG_221_2c
Bayerische Schwaben_ErzBS 12
OEG_221_1b
Condroz_SLCON014
Bayerische Schwaben_SLBS−28−B
Schwaebische Alb_Fd 130. Bef 153
Condroz_SLCON010
Condroz_SLCON013
Bayerische Schwaben_ErzBS 1
OEG_221_4a
0.25
0.00
−0.25
−0.50
Dim2 (15.4%)
−0.50
−0.25
0.00
0.25
Dim1 (60.4%)
cluster
1
2

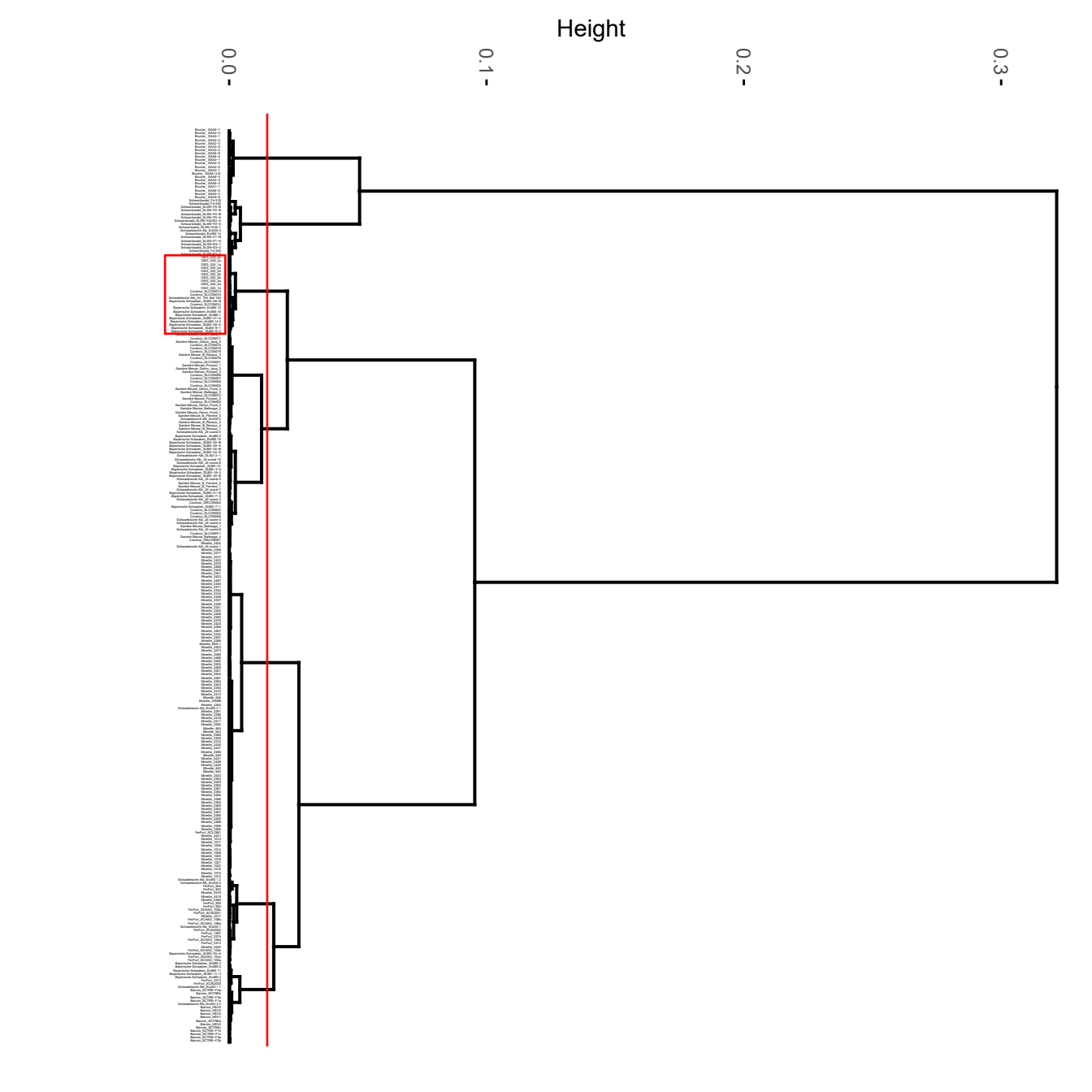
OEG 435

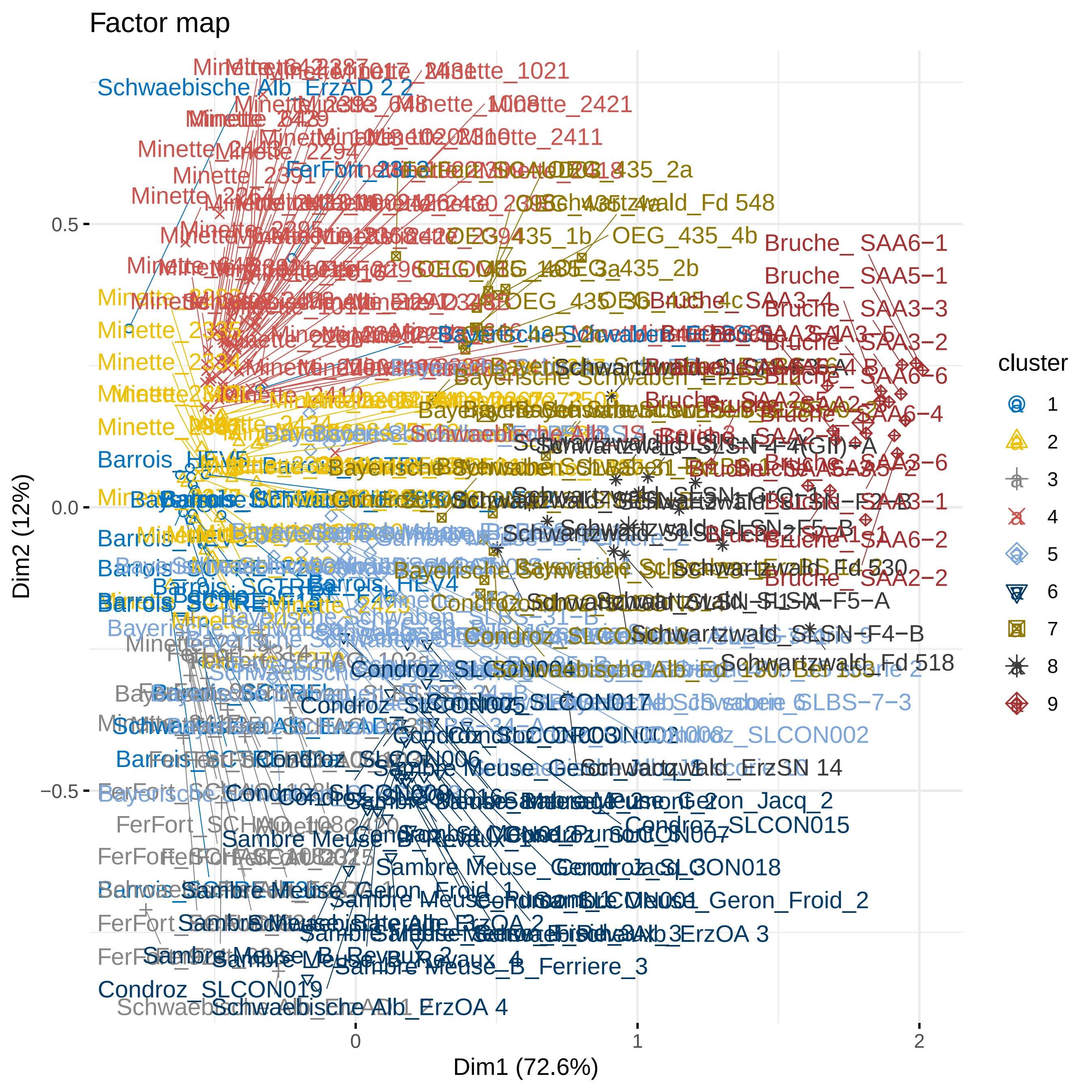

Scree plot
72.6%
12%
10.7%
2.6%
0.8%
0.5%
0.3%
0.3%
0.2%
0.1%
Percentage of explained variances
0
20
40
60
1
2
3
4
5
6
7
8
9
10
Dimensions


Variables − PCA
Xij_Th
Xij_U
Xij_Ce
Xij_Yb
Xij_Eu
Xij_Dy
Xij_Pr
Xij_Sm
Xij_Nd
Xij_Gd
Xij_La
Xij_Y
contrib
60
40
20
0.2
0.1
0.0
Dim2 (12%)
0.00
0.25
0.50
Dim1 (72.6%)

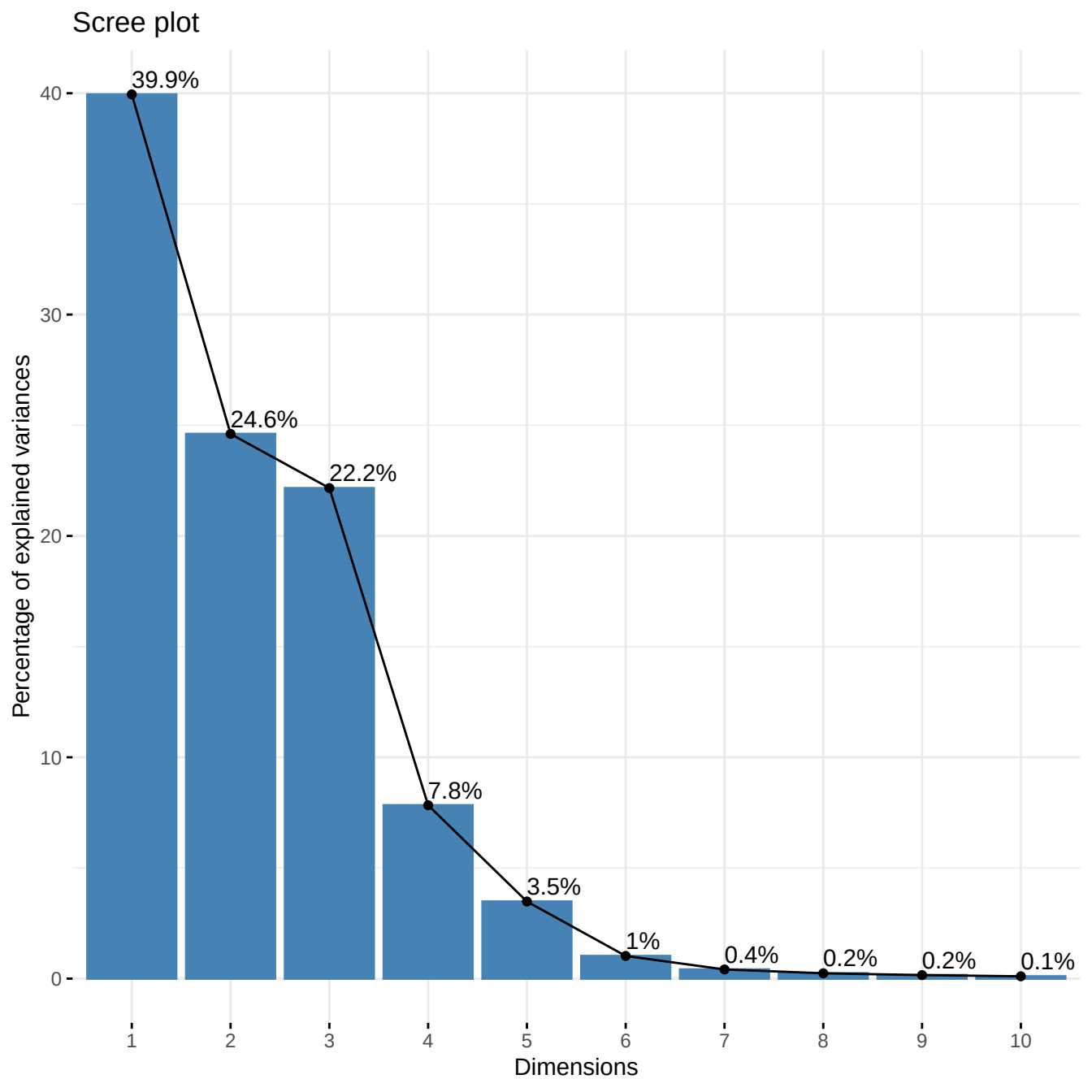

Individuals − PCA
Dim2 (12%)
Dim1 (72.6%)
0.5
0.0
−0.5
0
1
2
Groupes
Furnace slag
nail
Ore
smelting slag
Smelting slag?
Minette_2432
Minette_2431
FerFort_SCAUD03
OEG_435_2a
OEG_435_1b
OEG_435_4b
OEG_435_3b
FerFort_SCLOM1
Bruche_SAA6−1
Bruche_SAA5−1
Bruche_SAA3−3
Bruche_SAA3−2
Bruche_SAA5−2
Bruche_SAA1−1
Schwarzwald_SLSN−F5−A
Schwarzwald_SLSN−F1−A
Bayerische Schwaben_SLBS−21
Condroz_SLCON010
Condroz_SLCON008
Condroz_SLCON015
Condroz_SLCON006
Sambre Meuse_Geron_Jacq_1
Sambre Meuse_Baterage_2
Sambre Meuse_B_Revaux_3
Sambre Meuse_B_Ferriere_3
Sambre Meuse_B_Revaux_2
Schwaebische Alb_ErzOA 4

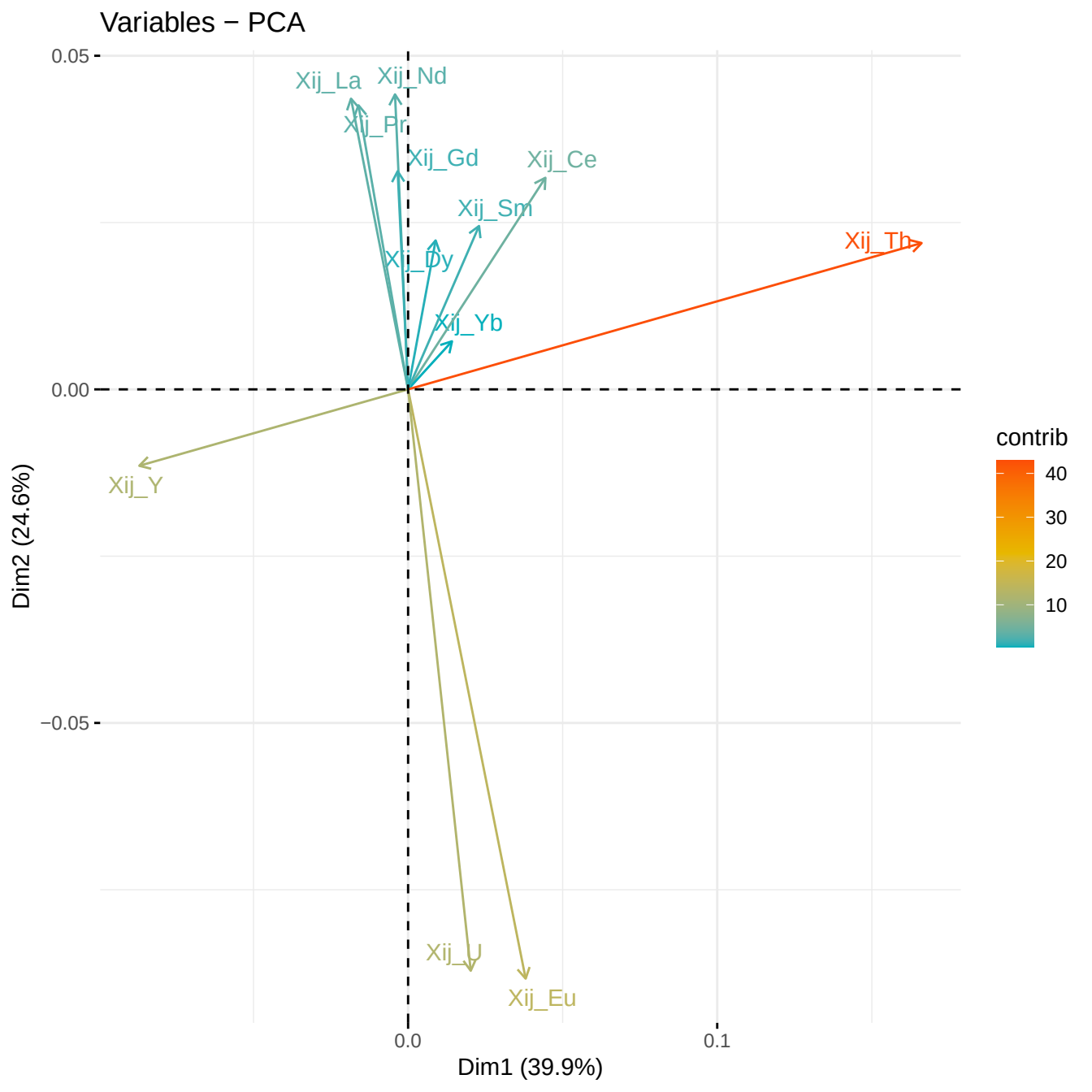

Optimal number of clusters
Gap statistic (k)
0.8
0.6
0.4
1
2
3
4
5
6
7
8
9
10
Number of clusters k

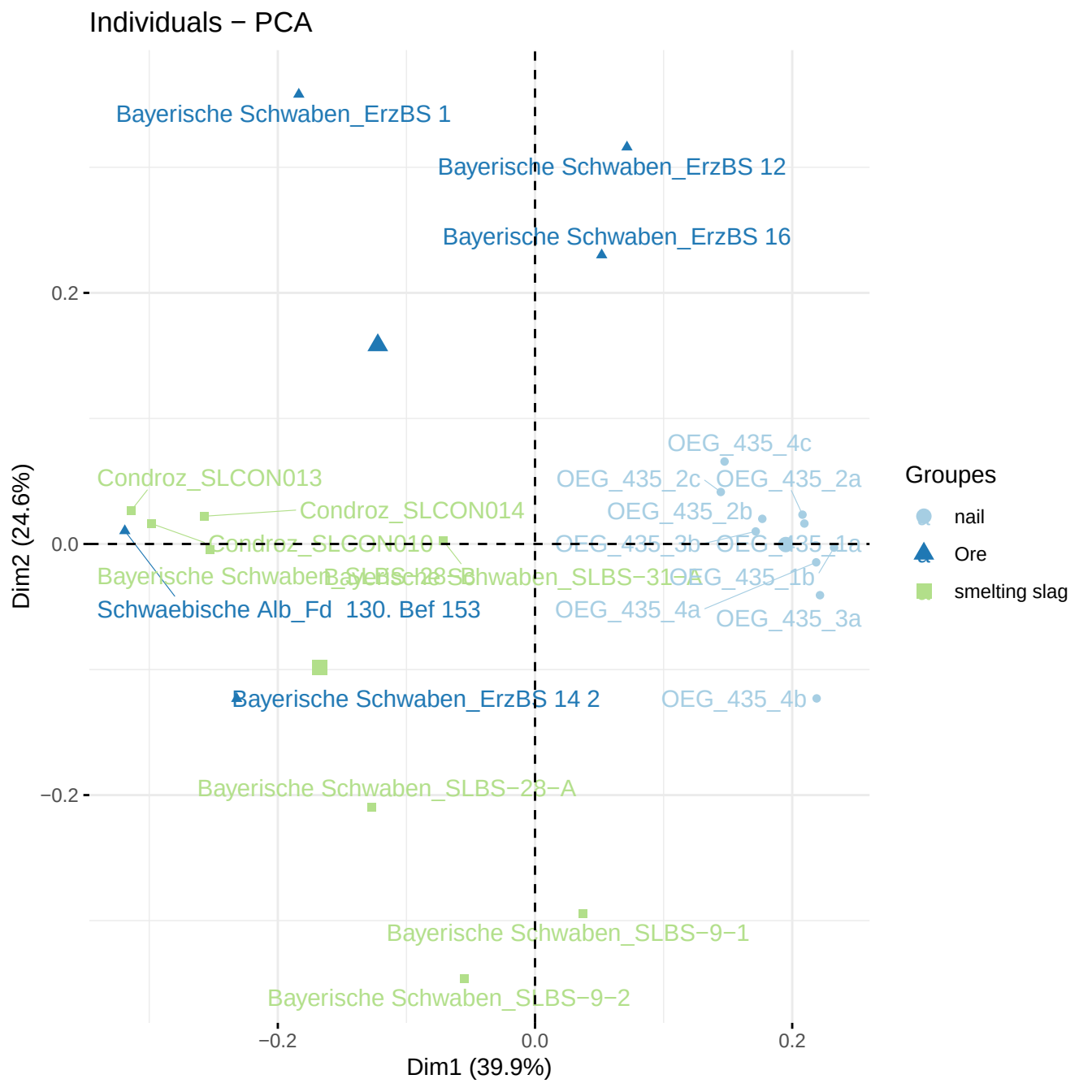

Height
0.0
0.1
0.2
0.3

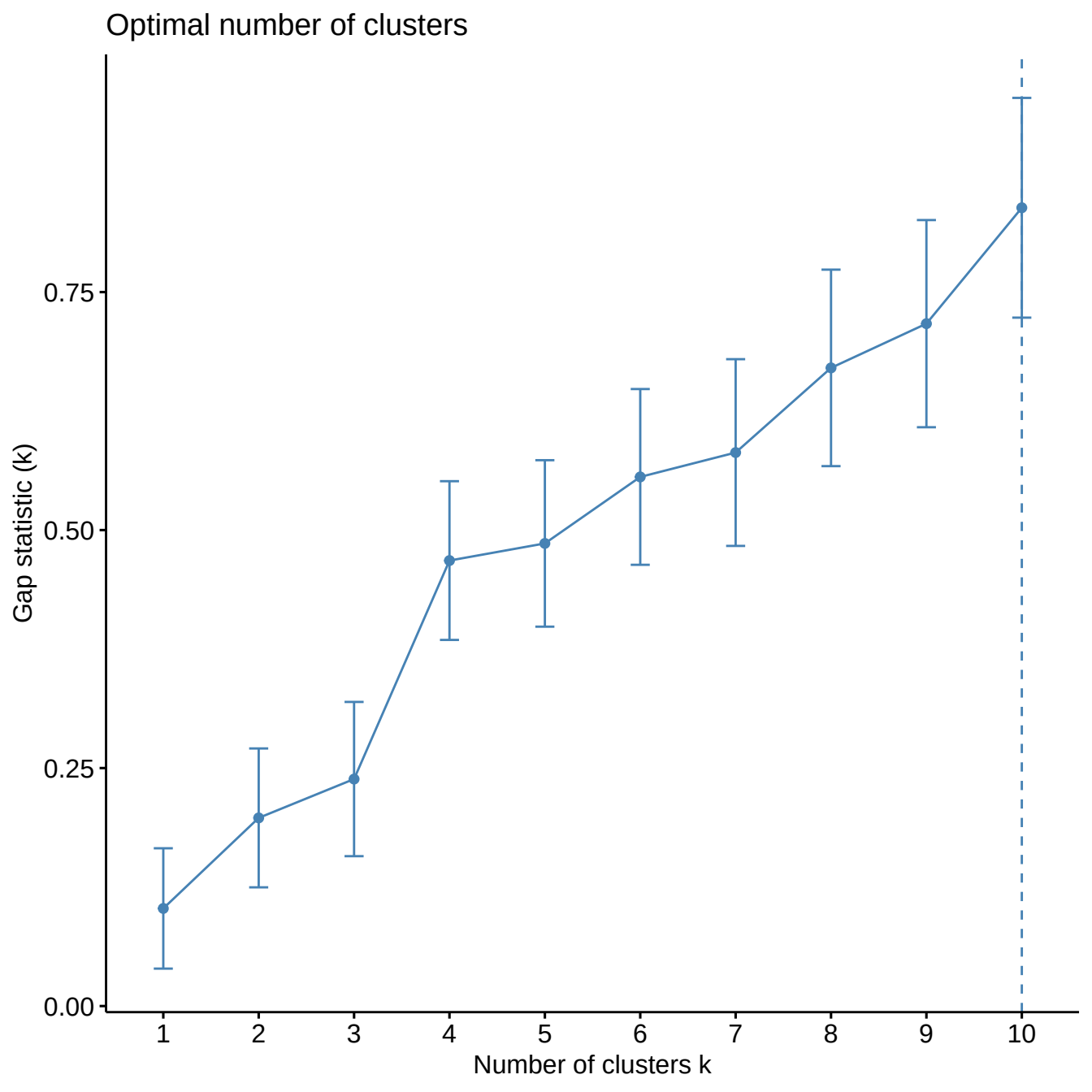


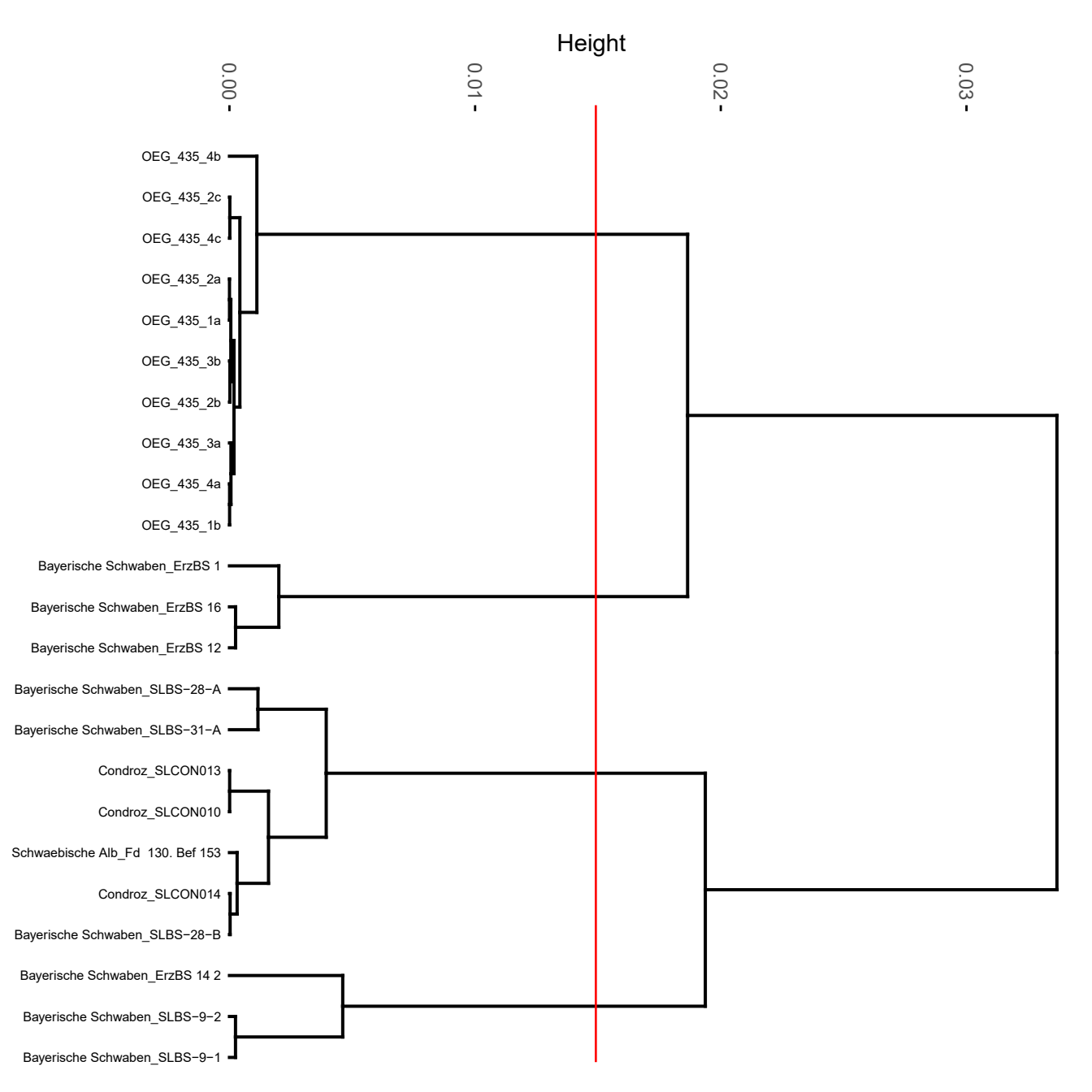
Factor map
Dim1 (72.6%)
Dim2 (12%)
0.5
0.0
−0.5
0
1
2
cluster
1
2
3
4
5
6
7
8
9
Schwaebische Alb_ErzAD 2 2
Minette_1021
Minette_2421
Minette_2411
Minette_2294
Minette_2391
OEG_435_2a
Schwartzwald_Fd 548
OEG_435_4b
OEG_435_2b
Bruche_ SAA6−1
Bruche_ SAA5−1
Bruche_ SAA3−3
Bruche_ SAA3−2
Bruche_ SAA6−6
Bruche_ SAA6−4
Bruche_ SAA3−6
Bruche_ SAA3−1
Bruche_ SAA6−2
Bruche_ SAA2−2
Minette_2385
Minette_2384
Barrois_HEV5
Barrois_HEV4
Schwartzwald_Fd 530
Schwartzwald_SLSN−F5−A
Schwartzwald_SLSN−F4−B
Schwartzwald_Fd 518
Condroz_SLCON017
Condroz_SLCON002
Schwartzwald_ErzSN 14
Condroz_SLCON015
Condroz_SLCON018
Sambre Meuse_Geron_Froid_2
Sambre Meuse_B_Ferriere_3
Condroz_SLCON019
Schwaebische Alb_ErzOA 4

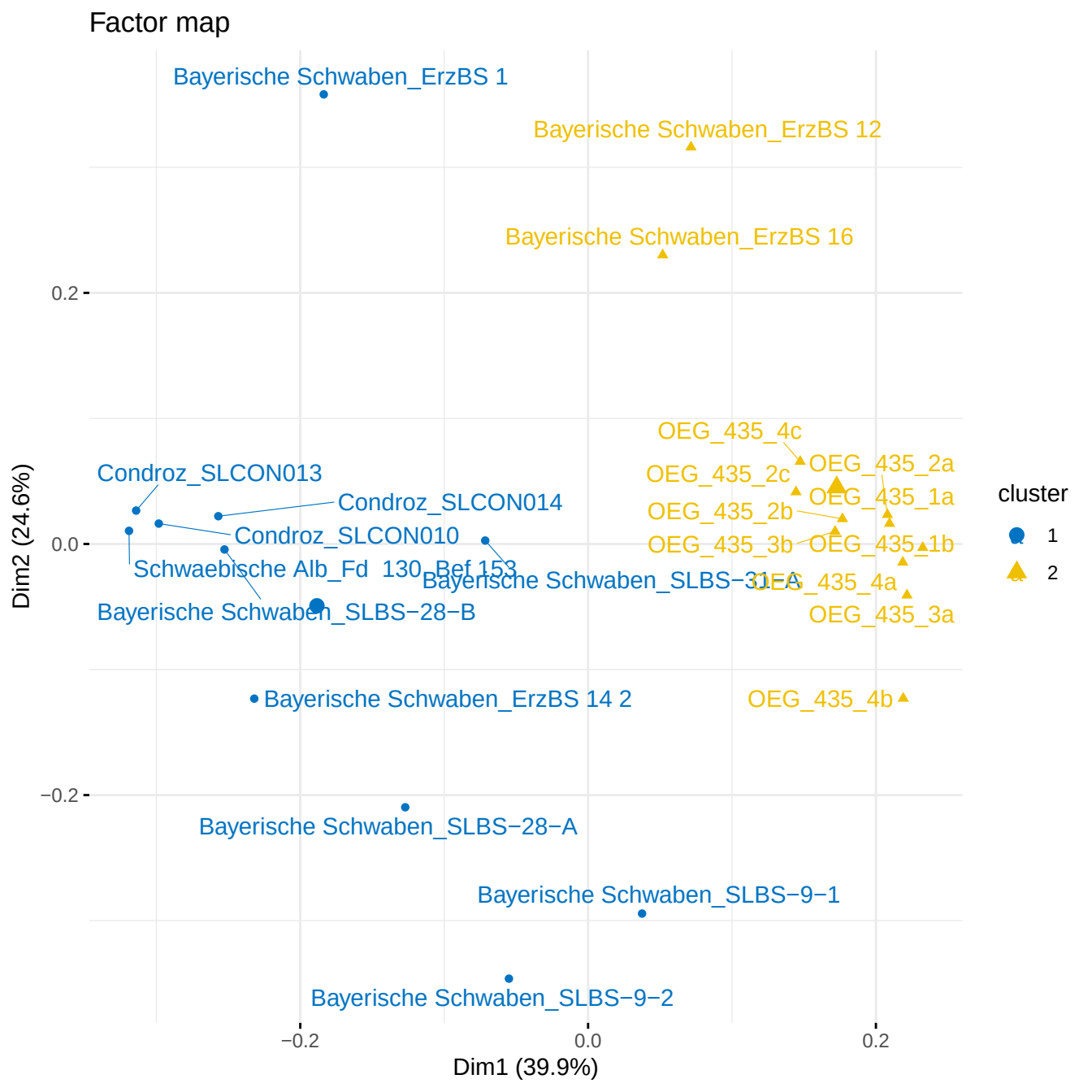

Scree plot
39.9%
24.6%
22.2%
7.8%
3.5%
1%
0.4%
0.2%
0.2%
0.1%
40
30
20
10
0
Percentage of explained variances
1
2
3
4
5
6
7
8
9
10
Dimensions


Variables − PCA
0.05
0.00
−0.05
0.0
0.1
Dim1 (39.9%)
Dim2 (24.6%)
Xij_La
Xij_Nd
Xij_Pr
Xij_Gd
Xij_Ce
Xij_Sm
Xij_Th
Xij_Dy
Xij_Yb
Xij_Y
Xij_U
Xij_Eu
contrib
40
30
20
10

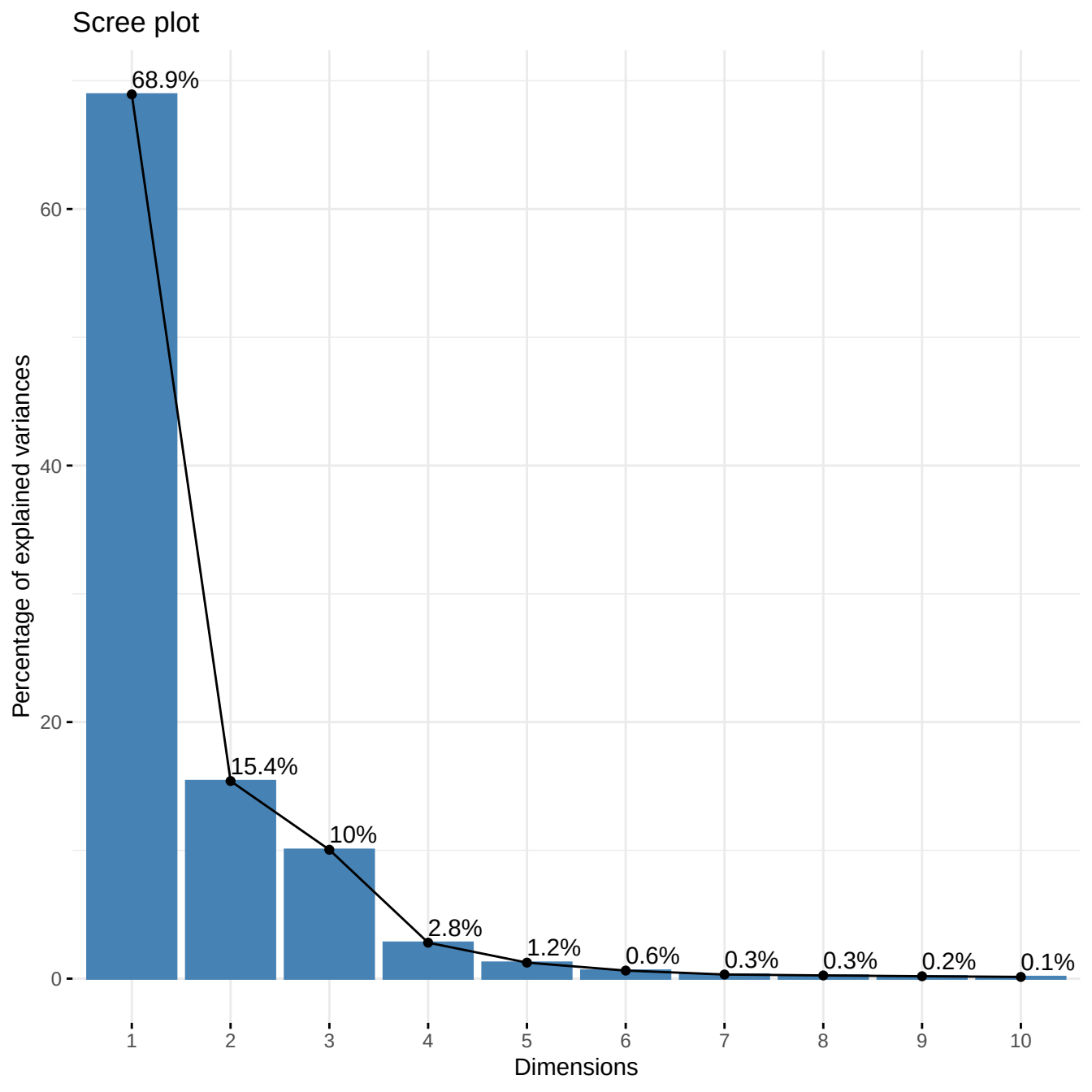

Individuals − PCA
Bayerische Schwaben_ErzBS 1
Bayerische Schwaben_ErzBS 12
Bayerische Schwaben_ErzBS 16
OEG_435_4c
Condroz_SLCON013
OEG_435_2c
OEG_435_2a
Condroz_SLCON014
OEG_435_2b
Condroz_SLCON010
OEG_435_3b
OEG_435_1a
Bayerische Schwaben_SLBS−28−B
Bayerische Schwaben_SLBS−31−A
OEG_435_1b
Schwaebische Alb_Fd 130. Bef 153
OEG_435_4a
OEG_435_3a
Bayerische Schwaben_ErzBS 14 2
OEG_435_4b
Bayerische Schwaben_SLBS−23−A
Bayerische Schwaben_SLBS−9−1
Bayerische Schwaben_SLBS−9−2
0.2
0.0
−0.2
Dim2 (24.6%)
−0.2
0.0
0.2
Dim1 (39.9%)
Groupes
nail
Ore
smelting slag

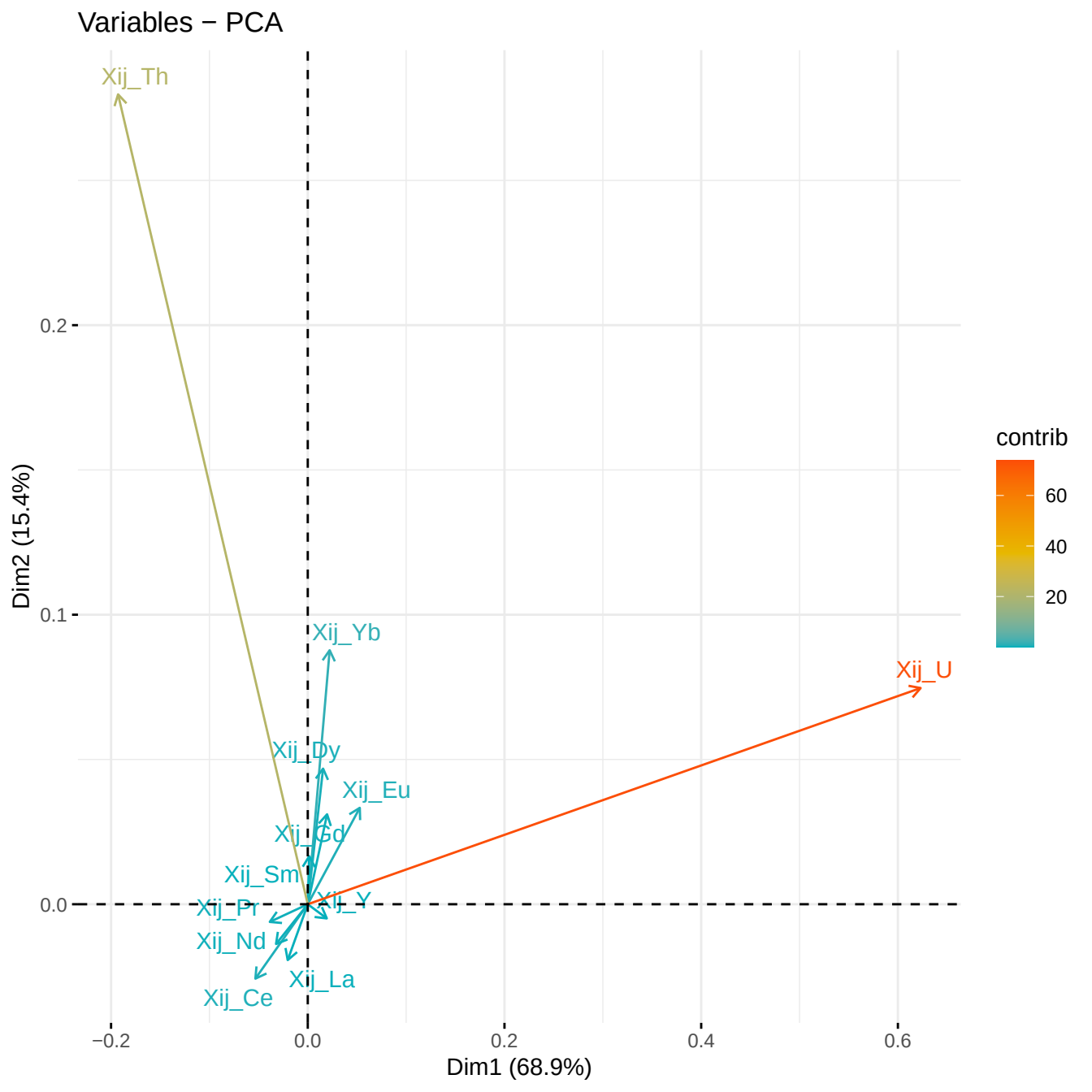

Optimal number of clusters
Gap statistic (k)
0.00
0.25
0.50
0.75
1
2
3
4
5
6
7
8
9
10
Number of clusters k

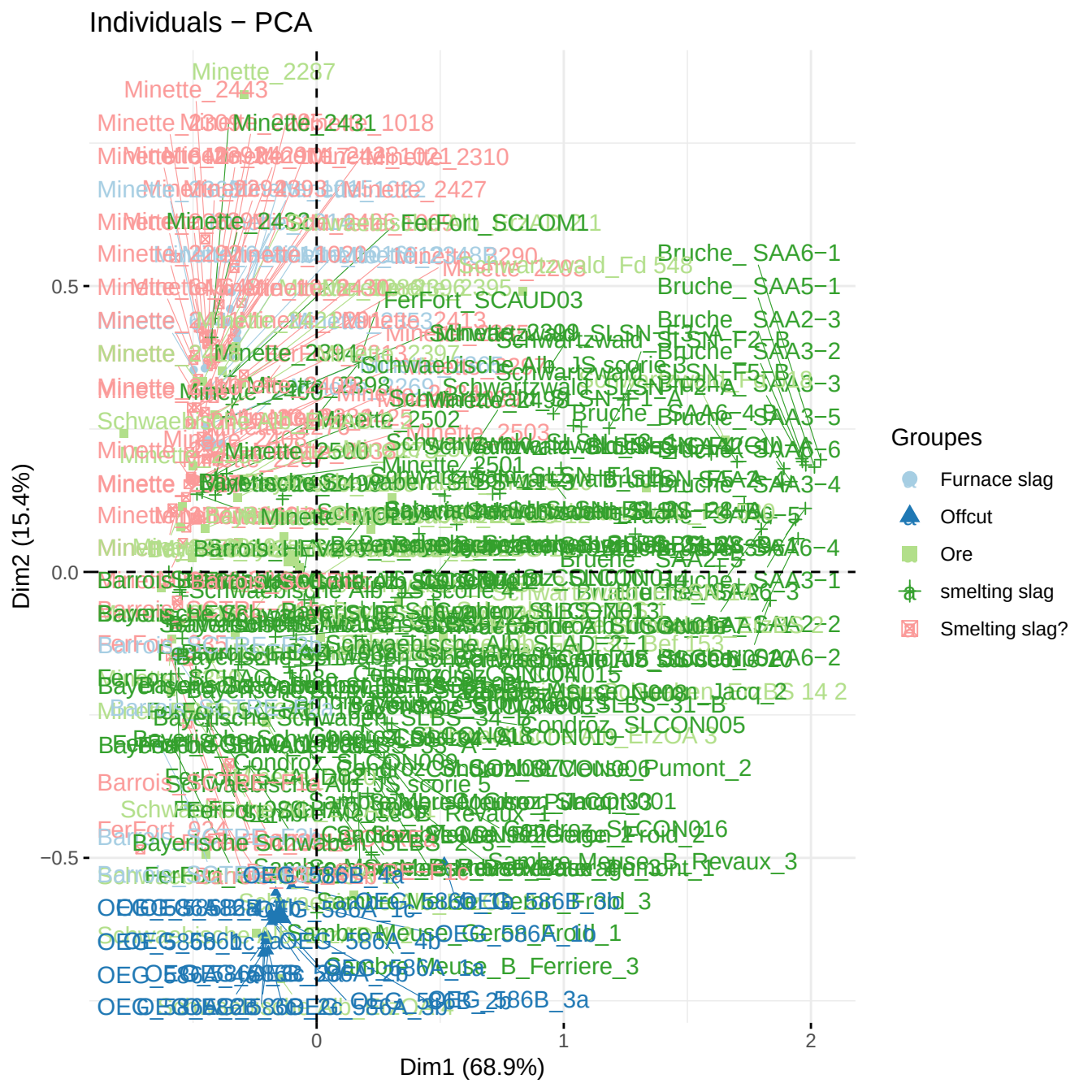

Height
0.00
0.01
0.02
0.03
OEG_435_4b
OEG_435_2c
OEG_435_4c
OEG_435_2a
OEG_435_1a
OEG_435_3b
OEG_435_2b
OEG_435_3a
OEG_435_4a
OEG_435_1b
Bayerische Schwaben_ErzBS 1
Bayerische Schwaben_ErzBS 16
Bayerische Schwaben_ErzBS 12
Bayerische Schwaben_SLBS−28−A
Bayerische Schwaben_SLBS−31−A
Condroz_SLCON013
Condroz_SLCON010
Schwaebische Alb_Fd 130. Bef 153
Condroz_SLCON014
Bayerische Schwaben_SLBS−28−B
Bayerische Schwaben_ErzBS 14 2
Bayerische Schwaben_SLBS−9−2
Bayerische Schwaben_SLBS−9−1

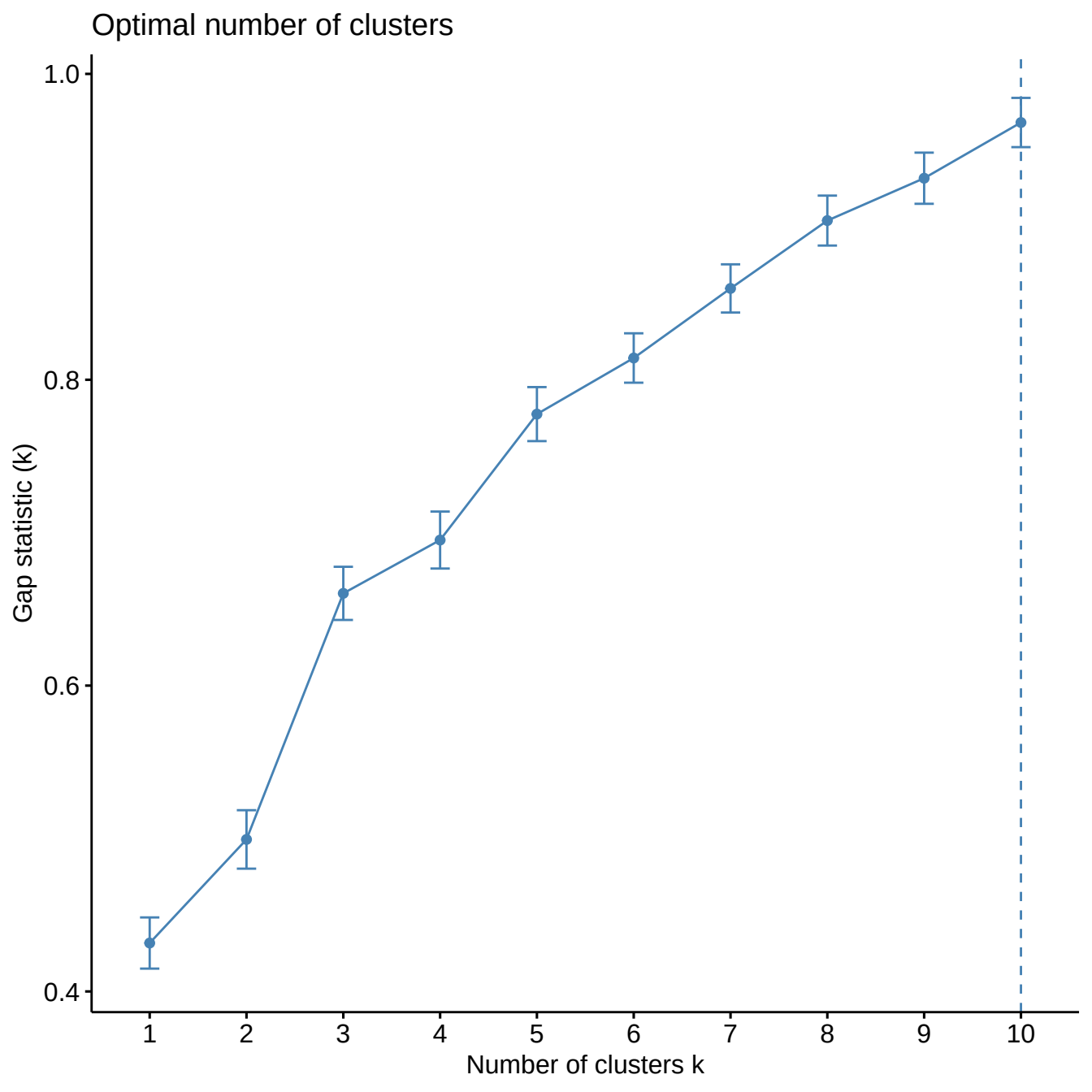

Factor map
Bayerische Schwaben_ErzBS 1
Bayerische Schwaben_ErzBS 12
Bayerische Schwaben_ErzBS 16
OEG_435_4c
OEG_435_2a
OEG_435_2c
OEG_435_1a
OEG_435_2b
OEG_435_3b
OEG_435_1b
OEG_435_4a
OEG_435_3a
Condroz_SLCON013
Condroz_SLCON014
Condroz_SLCON010
Schwaebische Alb_Fd 130_Bef 153
Bayerische Schwaben_SLBS−31−A
Bayerische Schwaben_SLBS−28−B
Bayerische Schwaben_ErzBS 14 2
OEG_435_4b
Bayerische Schwaben_SLBS−28−A
Bayerische Schwaben_SLBS−9−1
Bayerische Schwaben_SLBS−9−2
0.2
0.0
−0.2
Dim2 (24.6%)
−0.2
0.0
0.2
Dim1 (39.9%)
cluster
1
2

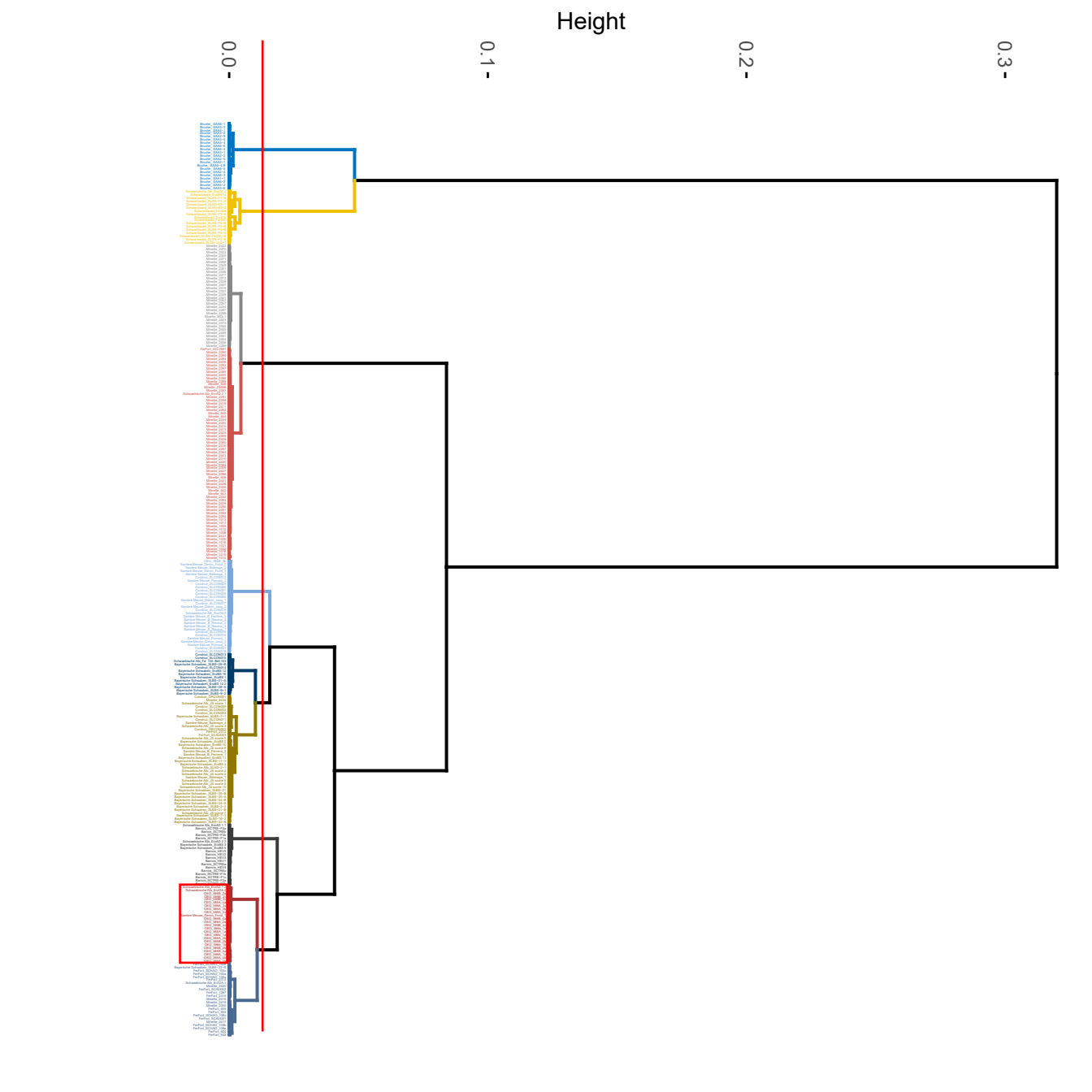
OEG 586

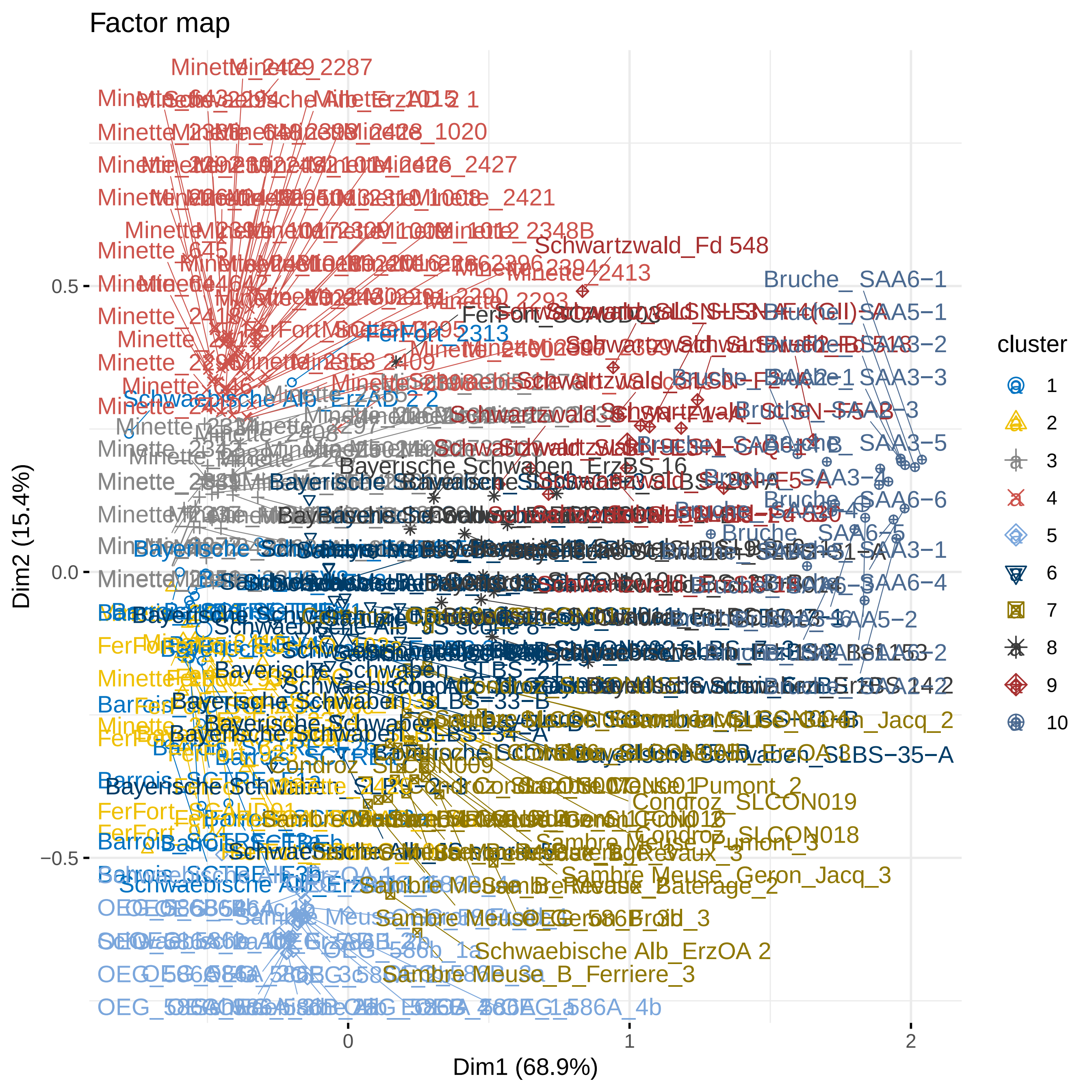

Scree plot
68.9%
15.4%
10%
2.8%
1.2%
0.6%
0.3%
0.3%
0.2%
0.1%
Percentage of explained variances
0
20
40
60
1
2
3
4
5
6
7
8
9
10
Dimensions


Variables − PCA
Xij_Th
Xij_Yb
Xij_U
Xij_Dy
Xij_Eu
Xij_Gd
Xij_Sm
Xij_Y
Xij_Pr
Xij_Nd
Xij_La
Xij_Ce
contrib
60
40
20
0.2
0.1
0.0
−0.2
0.0
0.2
0.4
0.6
Dim2 (15.4%)
Dim1 (68.9%)

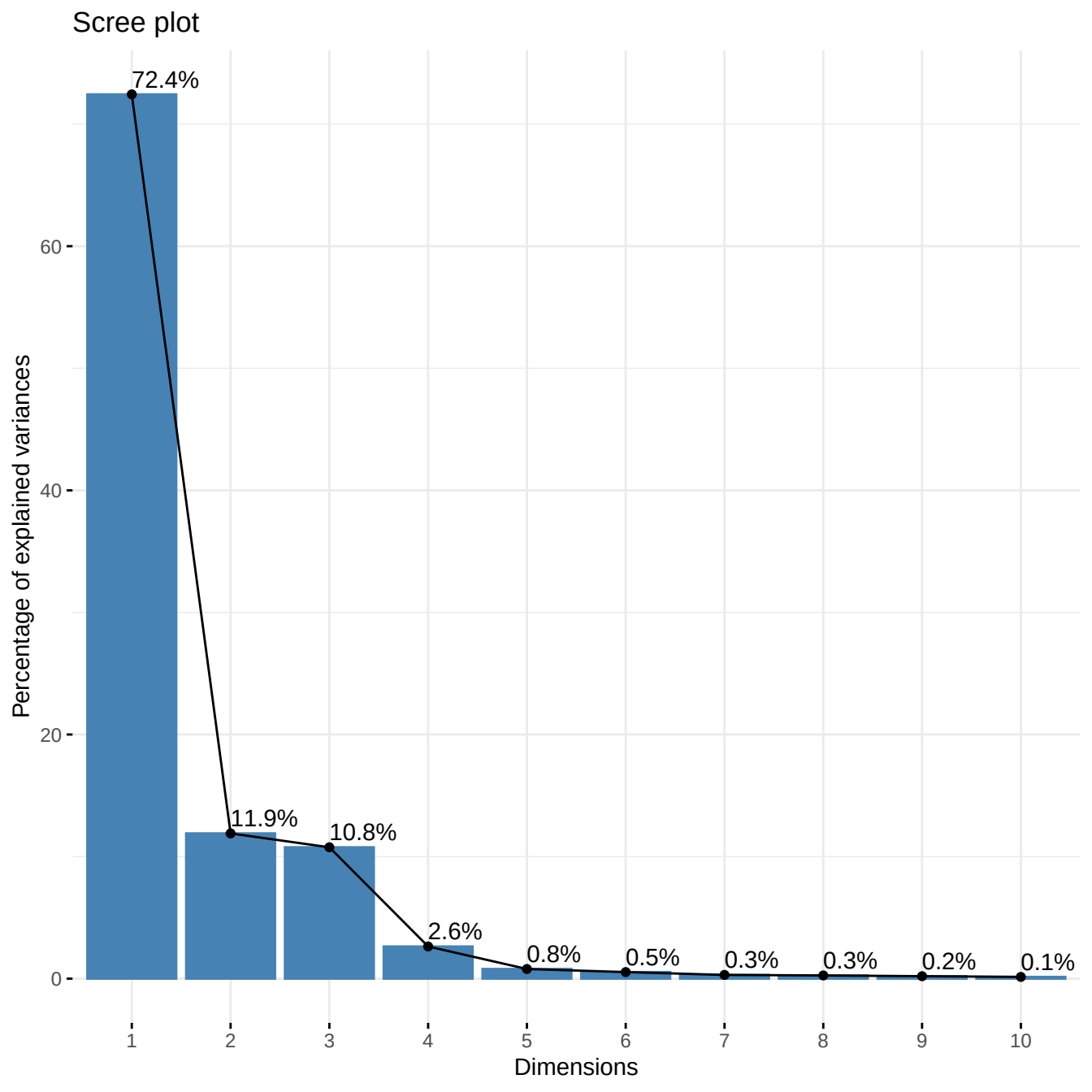

Individuals − PCA
Dim1 (68.9%)
Dim2 (15.4%)
Groupes
Furnace slag
Offcut
Ore
smelting slag
Smelting slag?

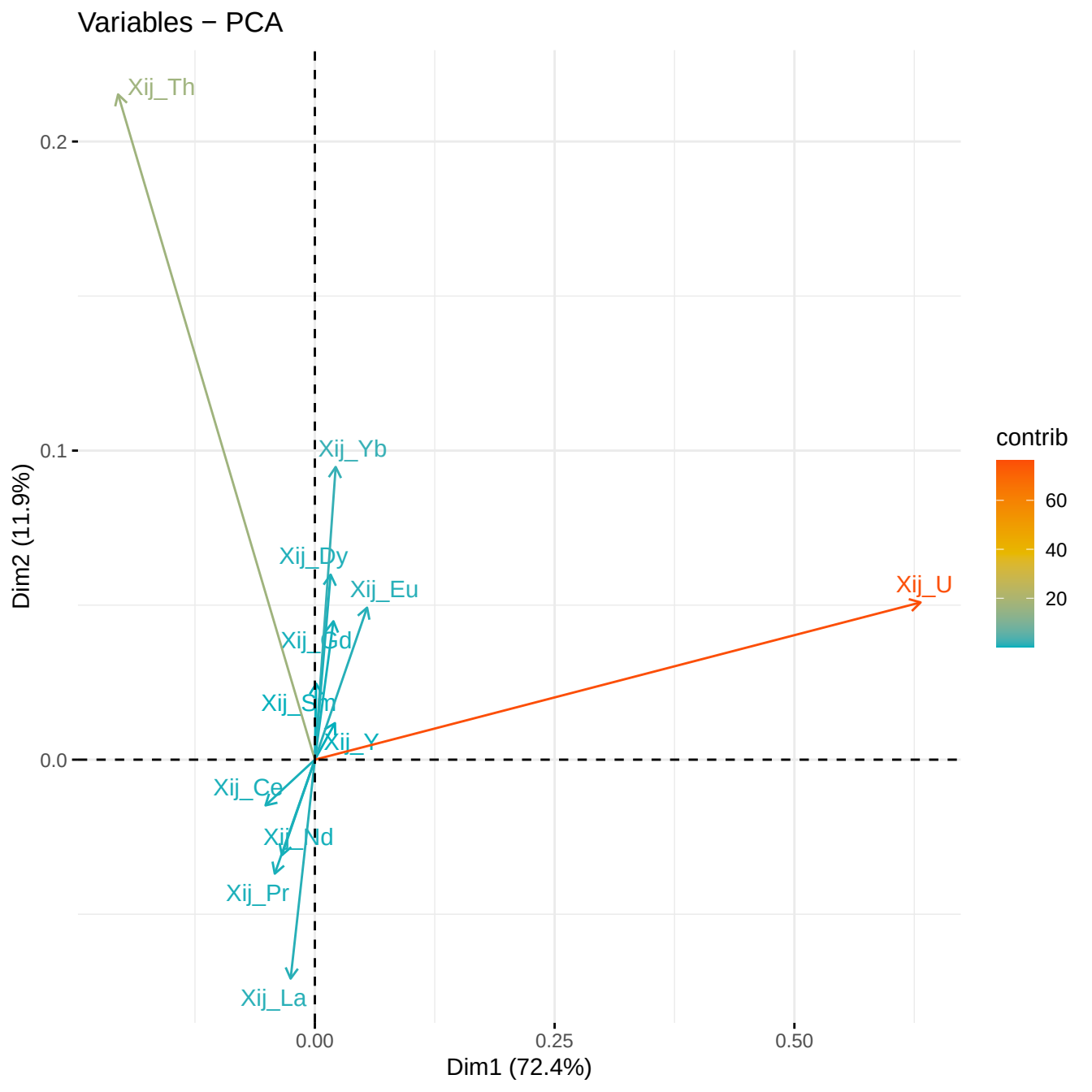

Optimal number of clusters
Gap statistic (k)
1.0
0.8
0.6
0.4
1
2
3
4
5
6
7
8
9
10
Number of clusters k

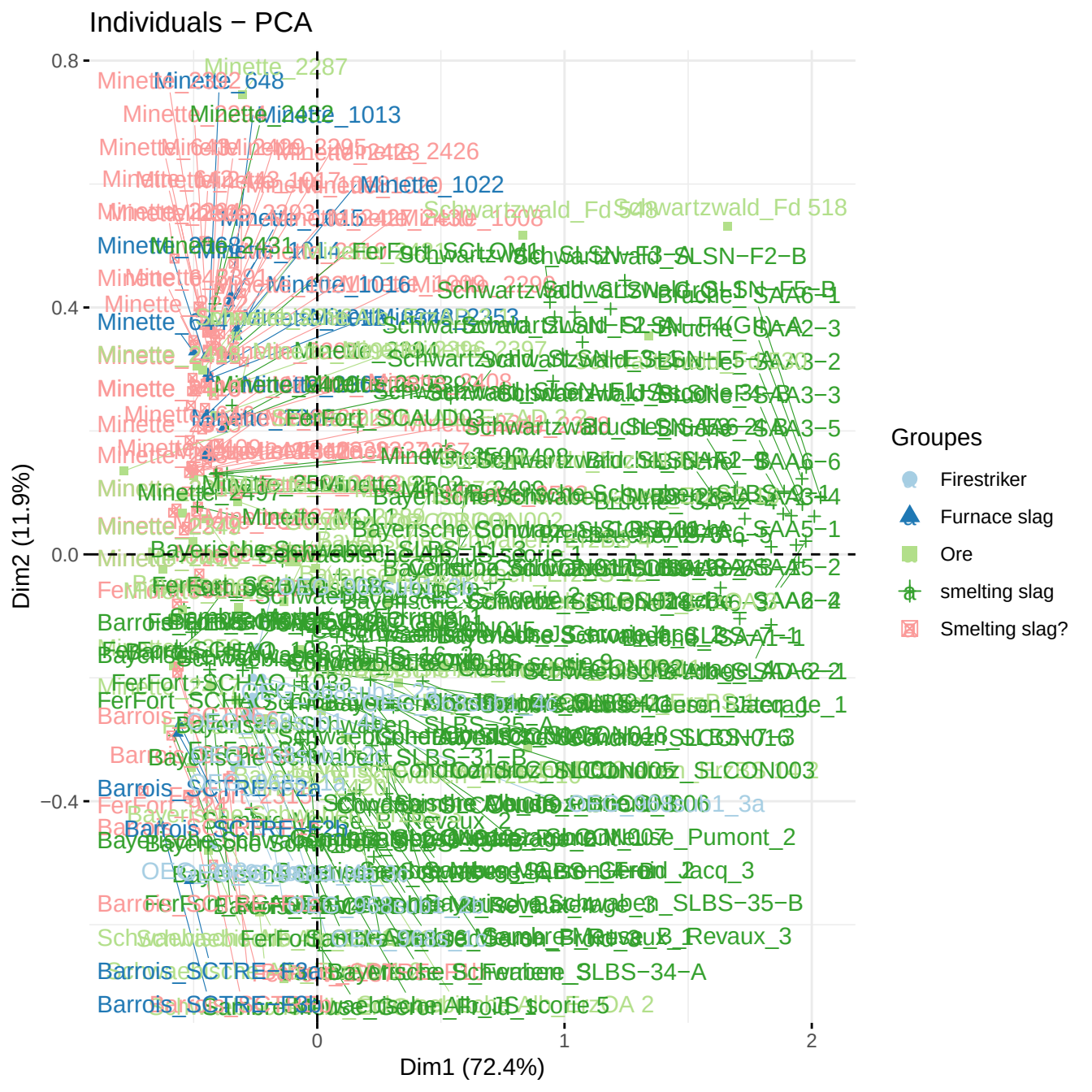

Height
0.0
0.1
0.2
0.3

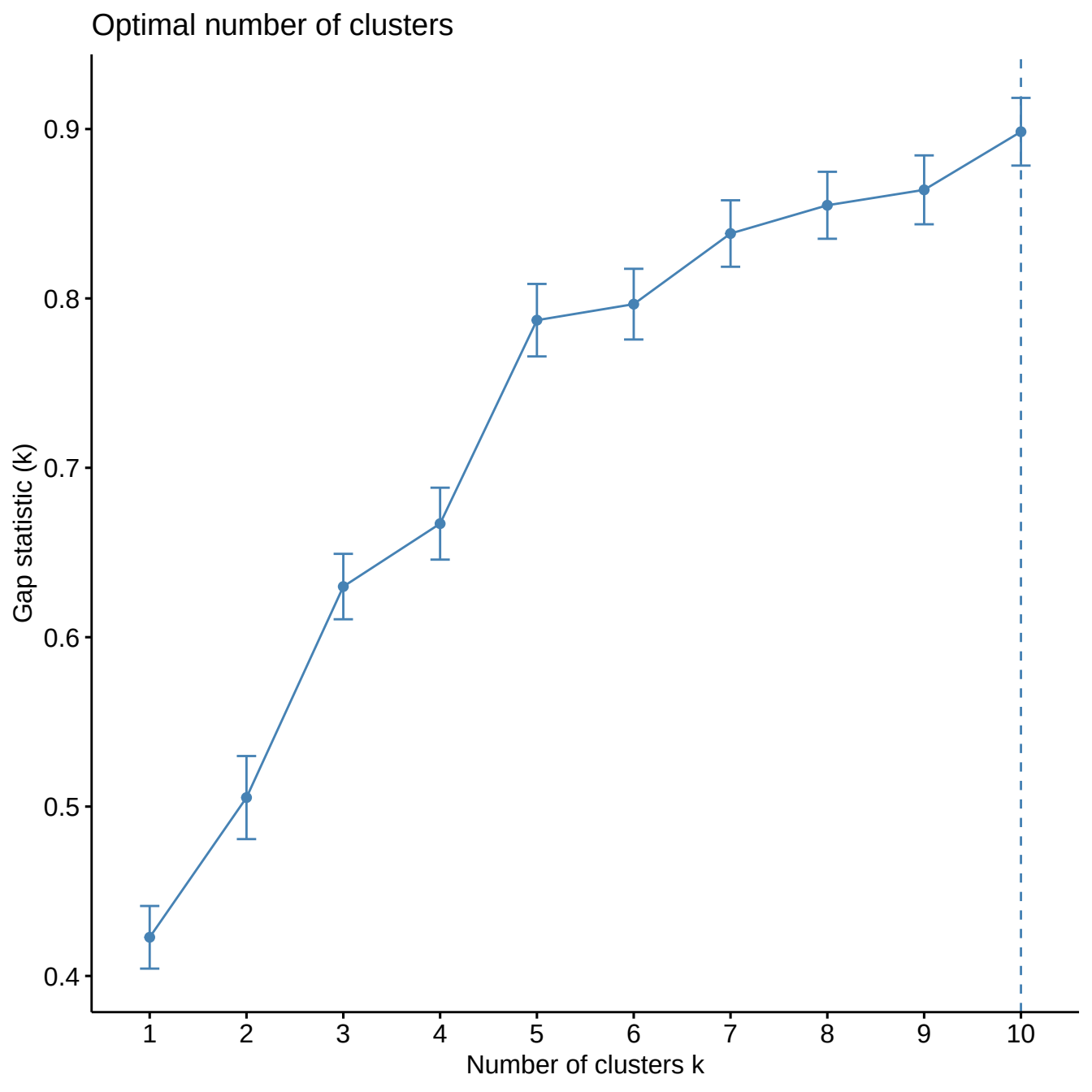

Factor map
Dim1 (68.9%)
Dim2 (15.4%)
0.5
0.0
−0.5
0
1
2
cluster
1
2
3
4
5
6
7
8
9
10
Schwartzwald_Fd 548
Bruche_ SAA6−1
Bruche_ SAA3−5
Bruche_ SAA6−6
Bayerische Schwaben_SLBS−35−A
Condroz_SLCON019
Condroz_SLCON018
Sambre Meuse_Geron_Jacq_3
Schwaebische Alb_ErzOA 2
Sambre Meuse_B_Ferriere_3

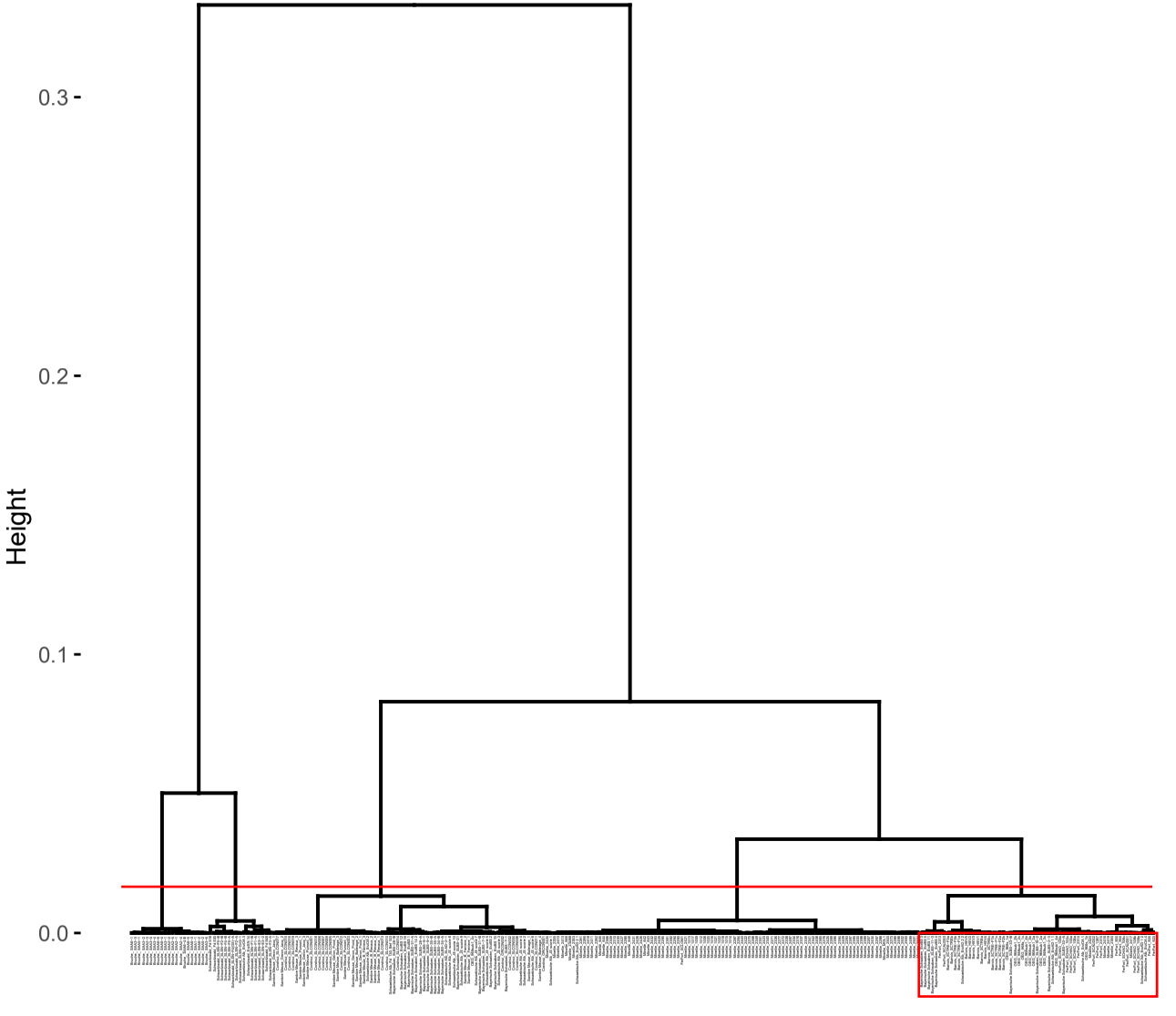
OEG 968 sub 1

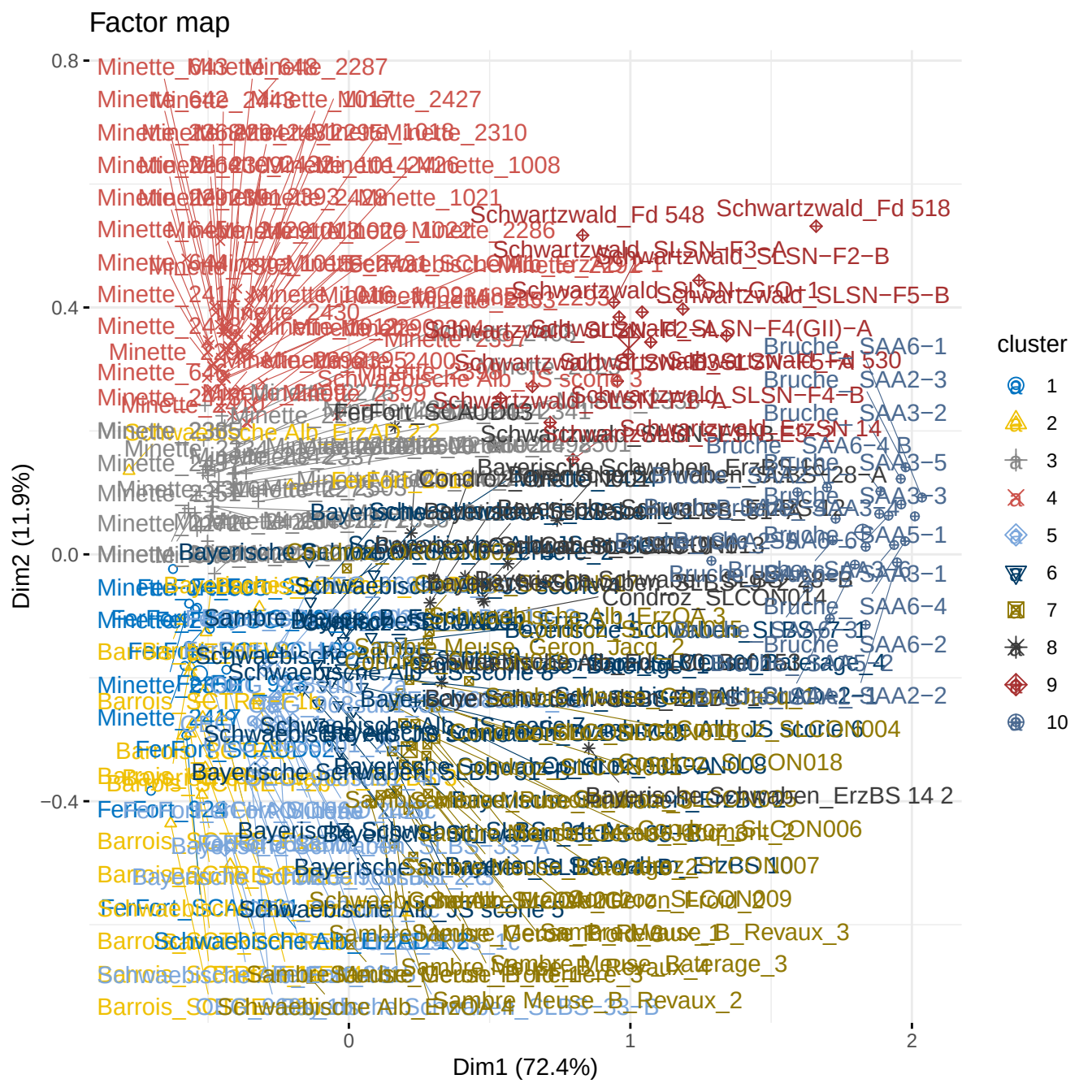

Scree plot
72.4%
11.9%
10.8%
2.6%
0.8%
0.5%
0.3%
0.3%
0.2%
0.1%
Percentage of explained variances
0
20
40
60
1
2
3
4
5
6
7
8
9
10
Dimensions

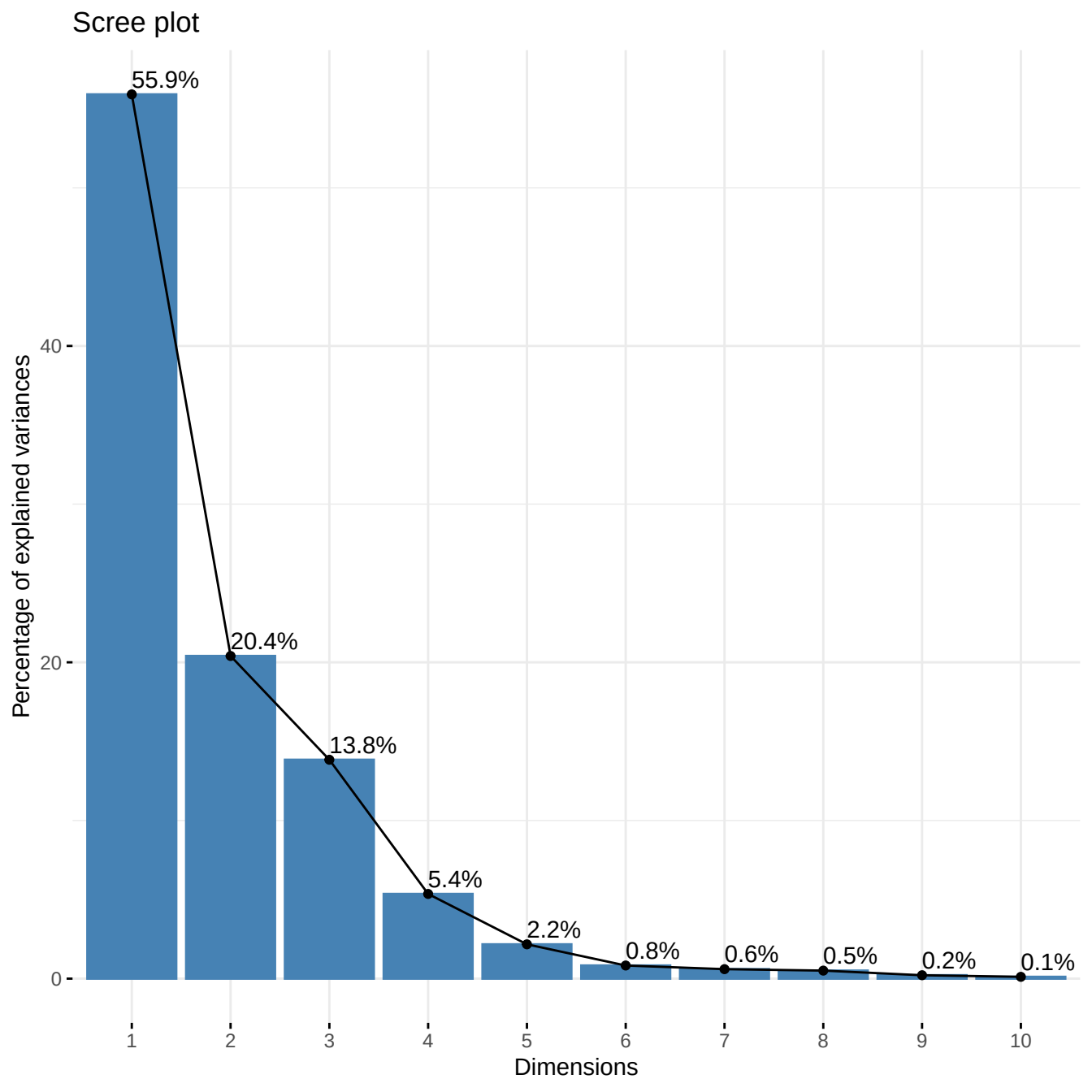

Variables − PCA
Xij_Th
Xij_Yb
Xij_Dy
Xij_Eu
Xij_U
Xij_Gd
Xij_Sm
Xij_Y
Xij_Ce
Xij_Nd
Xij_Pr
Xij_La
contrib
60
40
20
0.2
0.1
0.0
Dim2 (11.9%)
0.00
0.25
0.50
Dim1 (72.4%)

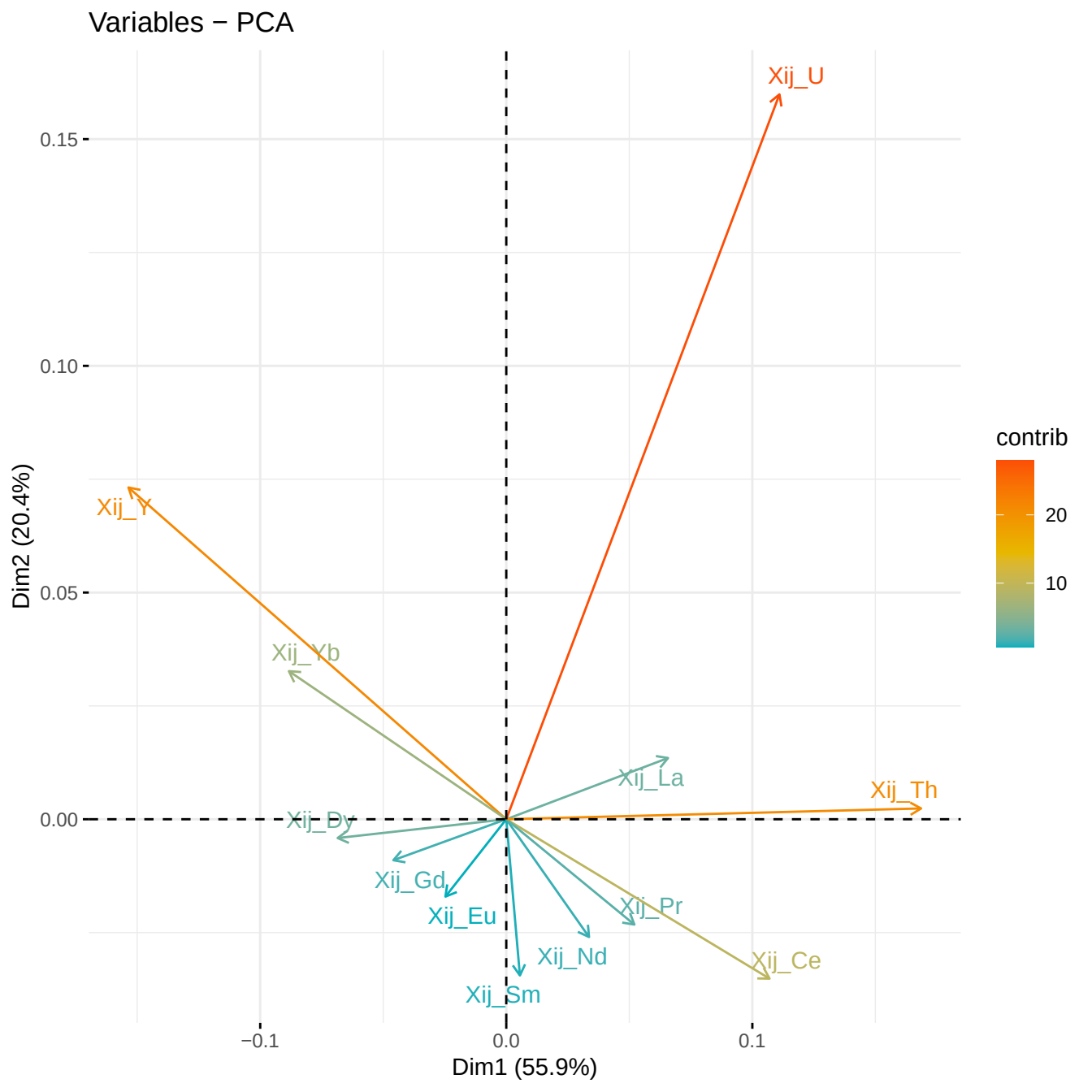

Individuals − PCA
Dim1 (72.4%)
Dim2 (11.9%)
0.8
0.4
0.0
−0.4
0
1
2
Groupes
Firestriker
Furnace slag
Ore
smelting slag
Smelting slag?

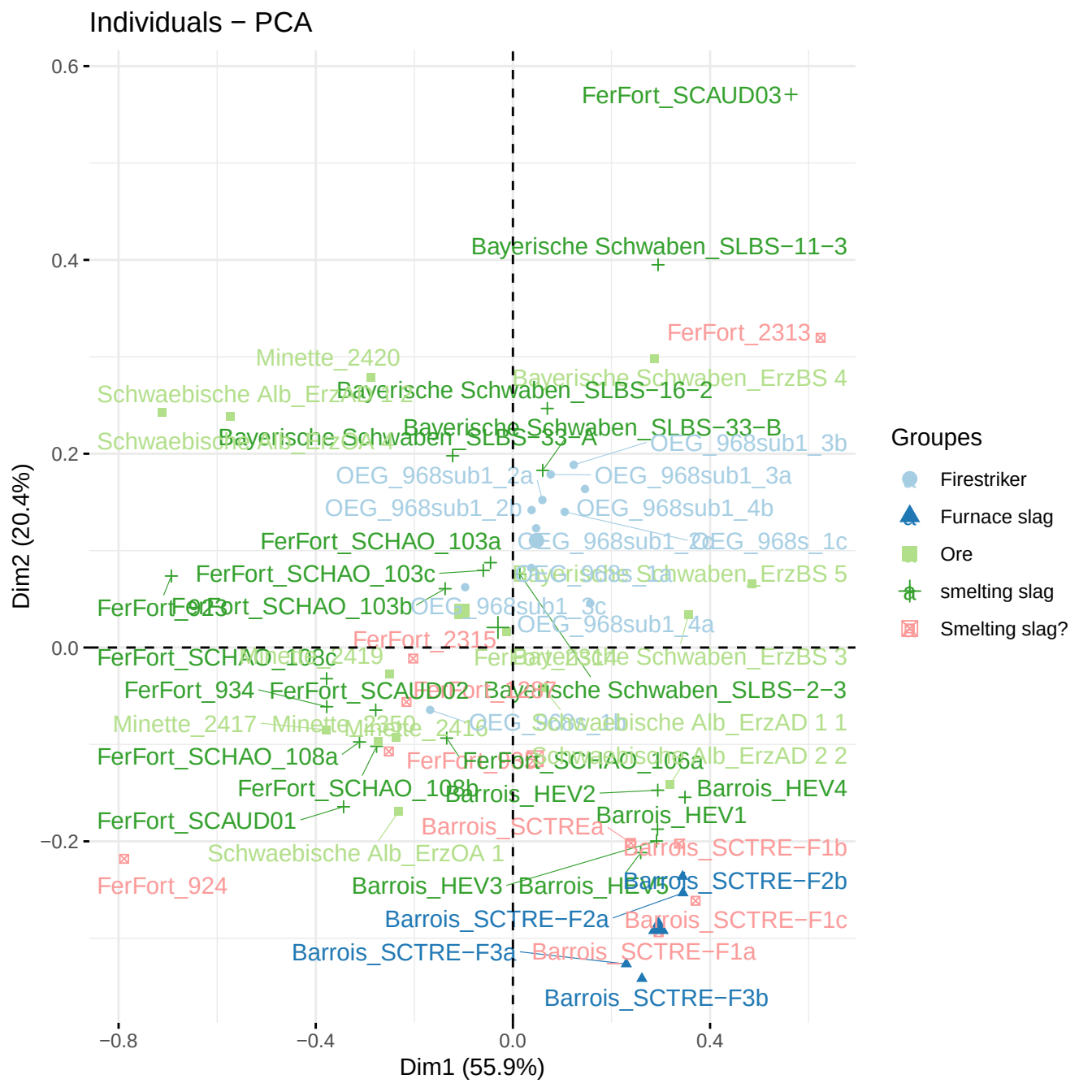

Optimal number of clusters
Gap statistic (k)
0.9
0.8
0.7
0.6
0.5
0.4
1
2
3
4
5
6
7
8
9
10
Number of clusters k

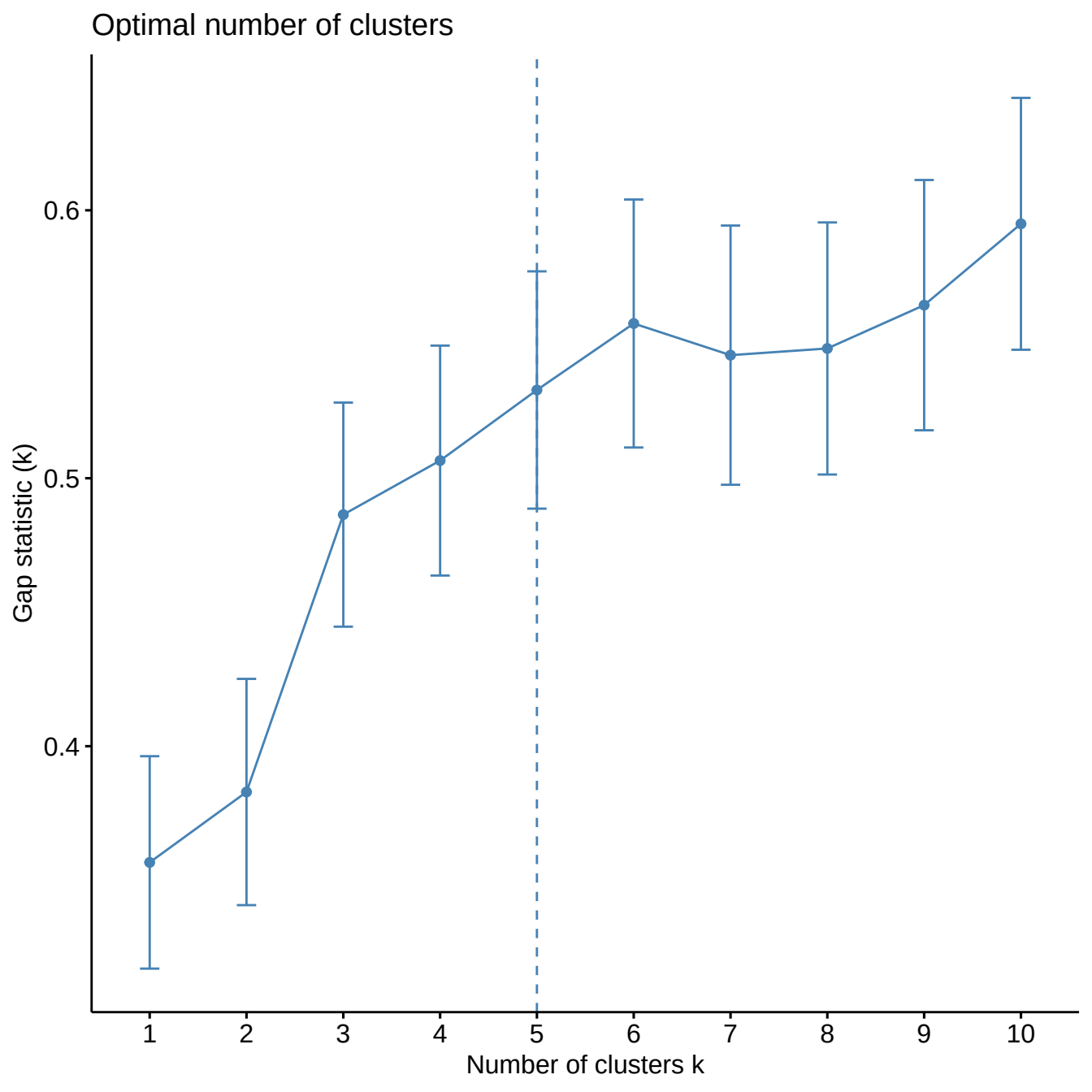

Height
0.3
0.2
0.1
0.0

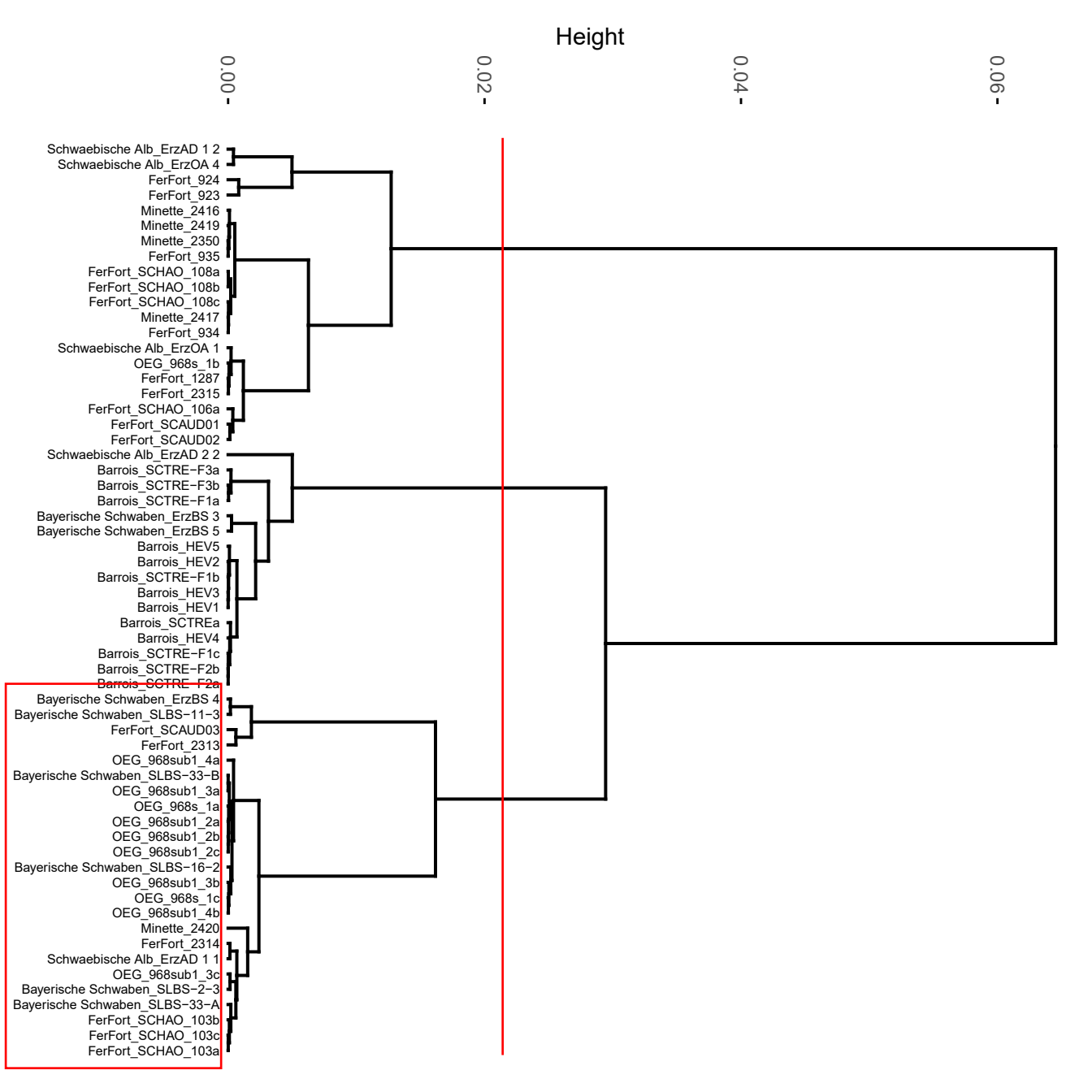

Factor map
Dim2 (11.9%)
Dim1 (72.4%)
0.8
0.4
0.0
−0.4
0
1
2
cluster
1
2
3
4
5
6
7
8
9
10
Schwartzwald_Fd 548
Schwartzwald_Fd 518
Schwartzwald_SLSN−F3−A
Schwartzwald_SLSN−F2−B
Schwartzwald_SLSN−F5−B
Schwartzwald_SLSN−F4(GII)−A
Schwartzwald_SLSN−F4−B
Schwartzwald_Fd 530
Bruche_SAA6−1
Bruche_SAA2−3
Bruche_SAA3−2
Bruche_SAA6−4 B
Bruche_SAA3−5
Bruche_SAA3−3
Bruche_SAA5−1
Bruche_SAA3−1
Bruche_SAA6−4
Bruche_SAA6−2
Bruche_SAA2−2
Schwaebische Alb_JS score 3
Schwaebische Alb_JS score 8
Schwaebische Alb_JS score 7
Schwaebische Alb_JS score 6
Schwaebische Alb_JS score 5
Bayerische Schwaben_ErzBS 14 2
Sambre Meuse_B_Revaux_1
Sambre Meuse_B_Revaux_3
Sambre Meuse_Baterage_3
Sambre Meuse_B_Revaux_2

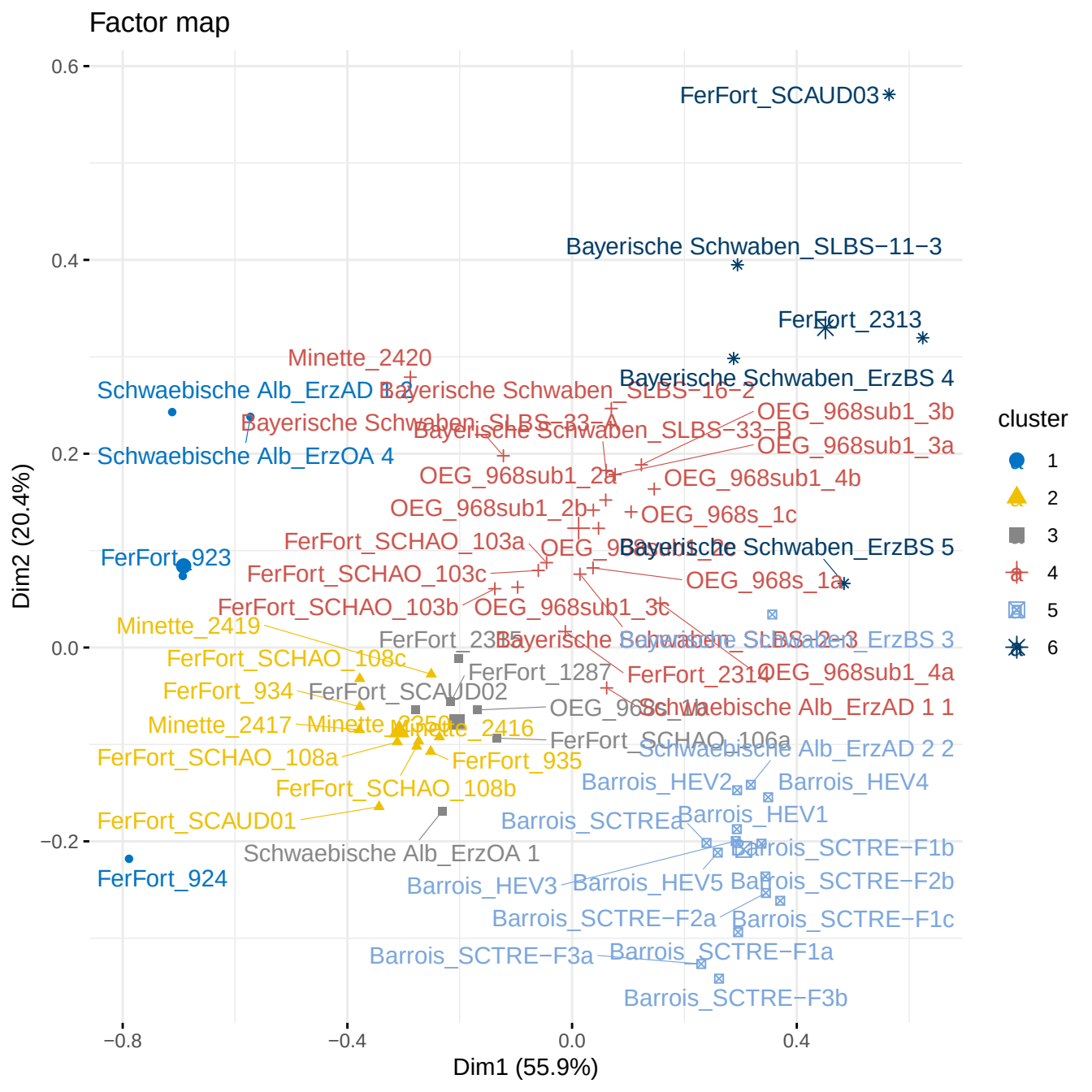

Scree plot
55.9%
20.4%
13.8%
5.4%
2.2%
0.8%
0.6%
0.5%
0.2%
0.1%
Percentage of explained variances
0
20
40
1
2
3
4
5
6
7
8
9
10
Dimensions

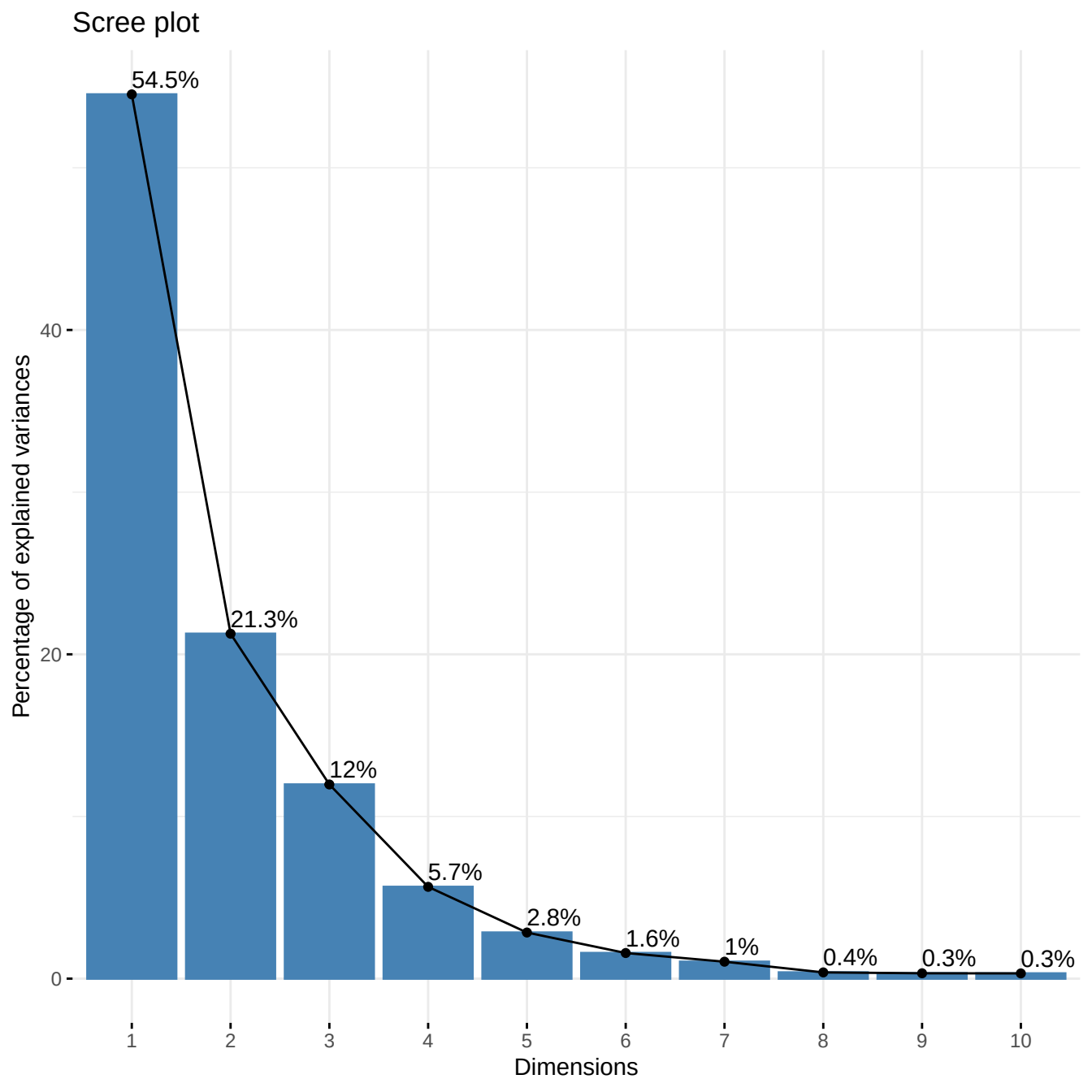

Variables − PCA
Xij_U
Xij_Y
Xij_Yb
Xij_La
Xij_Th
Xij_Dy
Xij_Gd
Xij_Eu
Xij_Pr
Xij_Nd
Xij_Ce
Xij_Sm
0.15
0.10
0.05
0.00
−0.1
0.0
0.1
Dim2 (20.4%)
Dim1 (55.9%)
contrib
20
10

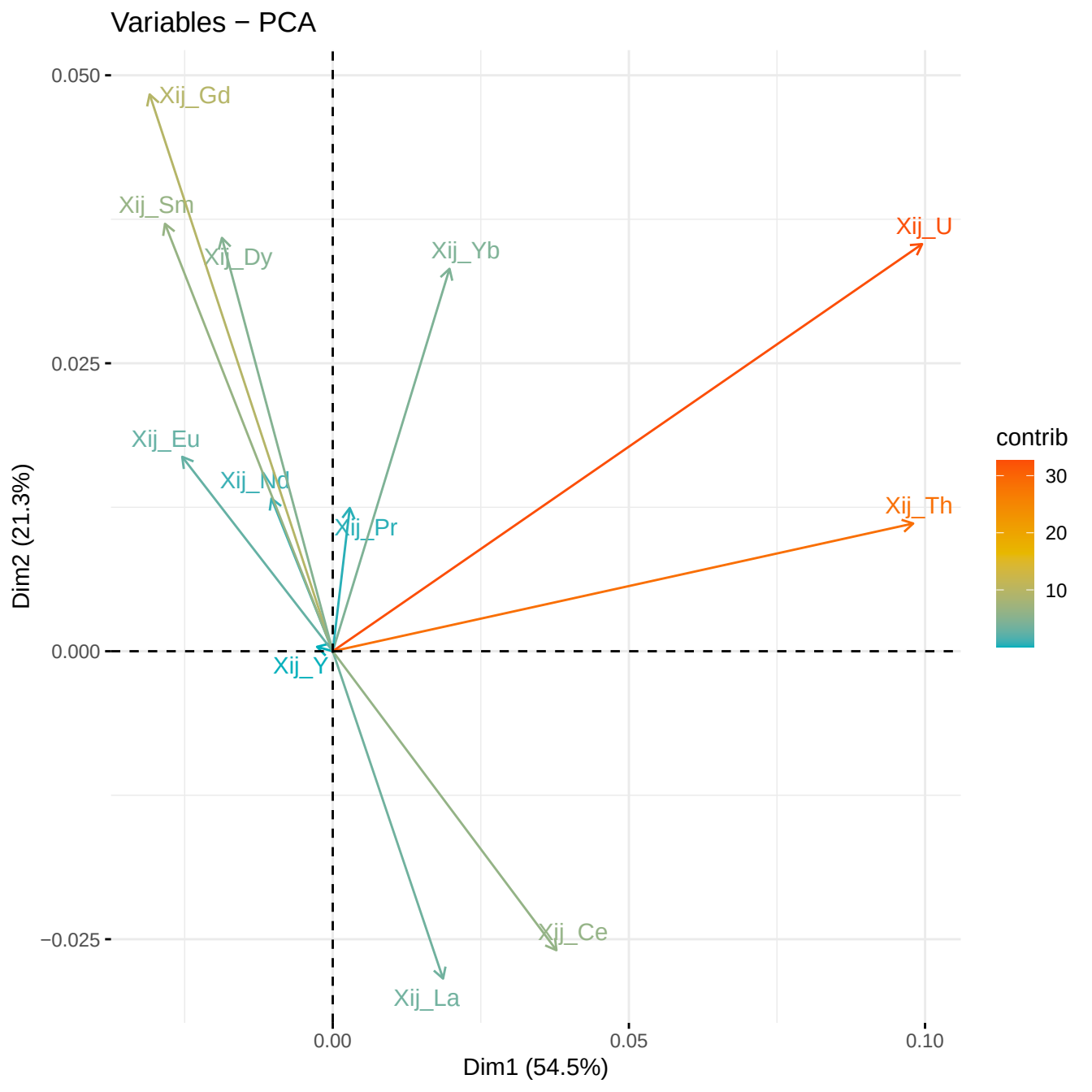

Individuals − PCA
Dim1 (55.9%)
Dim2 (20.4%)
0.6
0.4
0.2
0.0
−0.2
−0.8
−0.4
0.0
0.4
FerFort_SCAUD03+
Bayerische Schwaben_SLBS−11−3
FerFort_2313
Minette_2420
Bayerische Schwaben_ErzBS 4
Schwaebische Alb_ErzAD 1 2
Bayerische Schwaben_SLBS−16−2
Bayerische Schwaben_SLBS−33−B
Schwaebische Alb_ErzOA 4
Bayerische Schwaben_SLBS−33−A
OEG_968sub1_3b
OEG_968sub1_2a
OEG_968sub1_3a
OEG_968sub1_2b
OEG_968sub1_4b
FerFort_SCHAO_103a
OEG_968sub1_2c
OEG_968s_1c
FerFort_SCHAO_103c
Bayerische Schwaben_ErzBS 5
FerFort_923
FerFort_SCHAO_103b
OEG_968sub1_3c
OEG_968sub1_4a
FerFort_2315
FerFort_SCHAO_108c
Minette_2419
Bayerische Schwaben_ErzBS 3
FerFort_934
FerFort_SCAUD02
Bayerische Schwaben_SLBS−2−3
Minette_2417
Minette_2350
Minette_2410
OEG_968sub1_4b
Schwaebische Alb_ErzAD 1 1
FerFort_SCHAO_108a
FerFort_SCHAO_106a
Schwaebische Alb_ErzAD 2 2
FerFort_SCHAO_108b
Barrois_HEV2
Barrois_HEV4
FerFort_SCAUD01
Barrois_HEV1
Barrois_SCTREa
Barrois_SCTRE−F1b
Schwaebische Alb_ErzOA 1
FerFort_924
Barrois_HEV3
Barrois_HEV5
Barrois_SCTRE−F2b
Barrois_SCTRE−F2a
Barrois_SCTRE−F1c
Barrois_SCTRE−F3a
Barrois_SCTRE−F1a
Barrois_SCTRE−F3b
Groupes
Firestriker
Furnace slag
Ore
smelting slag
Smelting slag?

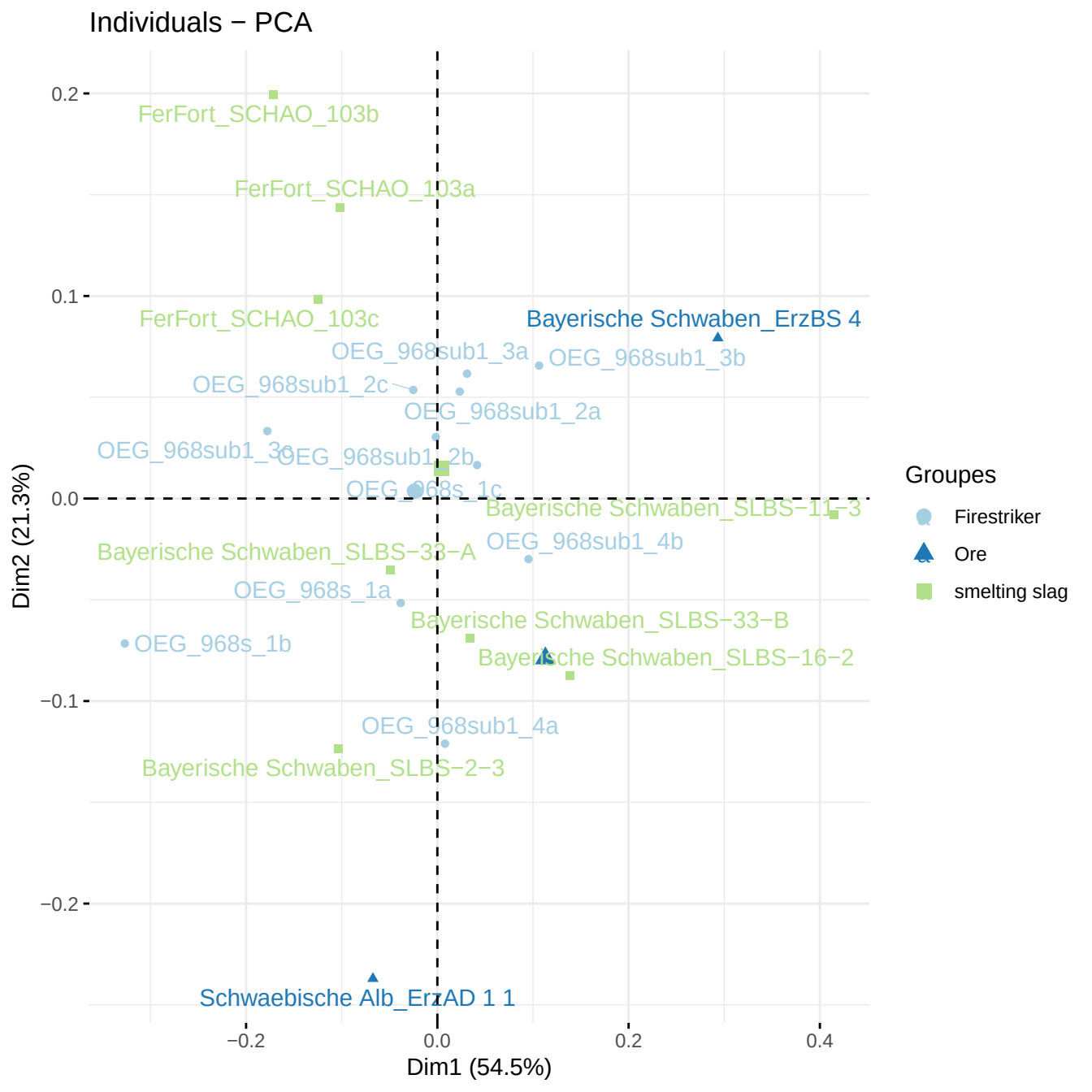

Optimal number of clusters
Gap statistic (k)
0.6
0.5
0.4
1
2
3
4
5
6
7
8
9
10
Number of clusters k

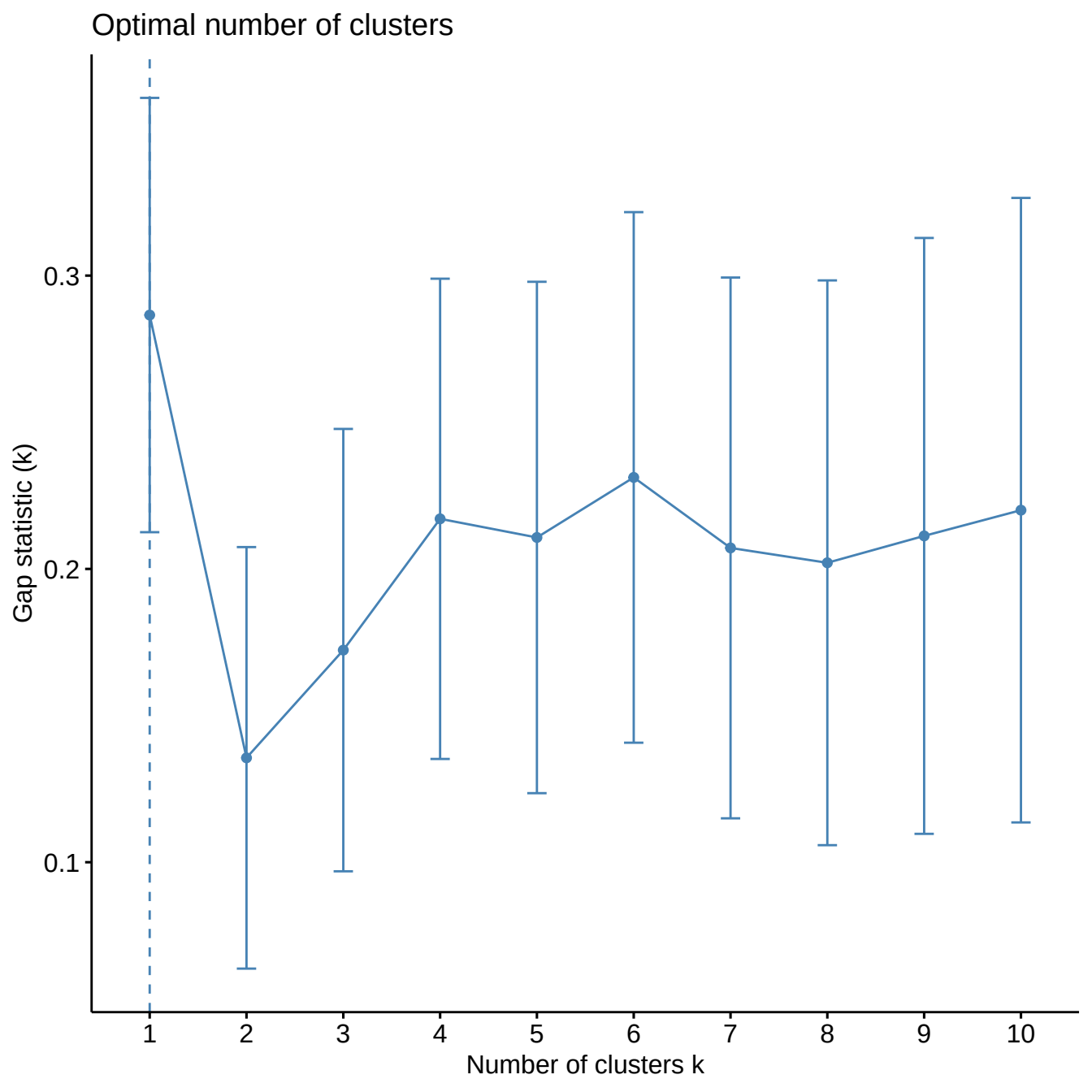

Height
0.00
0.02
0.04
0.06
Schwaebische Alb_ErzAD 1 2
Schwaebische Alb_ErzOA 4
FerFort_924
FerFort_923
Minette_2416
Minette_2419
Minette_2350
FerFort_935
FerFort_SCHAO_108a
FerFort_SCHAO_108b
FerFort_SCHAO_108c
Minette_2417
FerFort_934
Schwaebische Alb_ErzOA 1
OEG_968s_1b
FerFort_1287
FerFort_2315
FerFort_SCHAO_106a
FerFort_SCAUD01
FerFort_SCAUD02
Schwaebische Alb_ErzAD 2 2
Barrois_SCTRE−F3a
Barrois_SCTRE−F3b
Barrois_SCTRE−F1a
Bayerische Schwaben_ErzBS 3
Bayerische Schwaben_ErzBS 5
Barrois_HEV5
Barrois_HEV2
Barrois_SCTRE−F1b
Barrois_HEV3
Barrois_HEV1
Barrois_SCTREa
Barrois_HEV4
Barrois_SCTRE−F1c
Barrois_SCTRE−F2b
Barrois_SCTRE−F2a
Bayerische Schwaben_ErzBS 4
Bayerische Schwaben_SLBS−11−3
FerFort_SCAUD03
FerFort_2313
OEG_968sub1_4a
Bayerische Schwaben_SLBS−33−B
OEG_968sub1_3a
OEG_968s_1a
OEG_968sub1_2a
OEG_968sub1_2b
OEG_968sub1_2c
Bayerische Schwaben_SLBS−16−2
OEG_968sub1_3b
OEG_968s_1c
OEG_968sub1_4b
Minette_2420
FerFort_2314
Schwaebische Alb_ErzAD 1 1
OEG_968sub1_3c
Bayerische Schwaben_SLBS−2−3
Bayerische Schwaben_SLBS−33−A
FerFort_SCHAO_103b
FerFort_SCHAO_103c
FerFort_SCHAO_103a

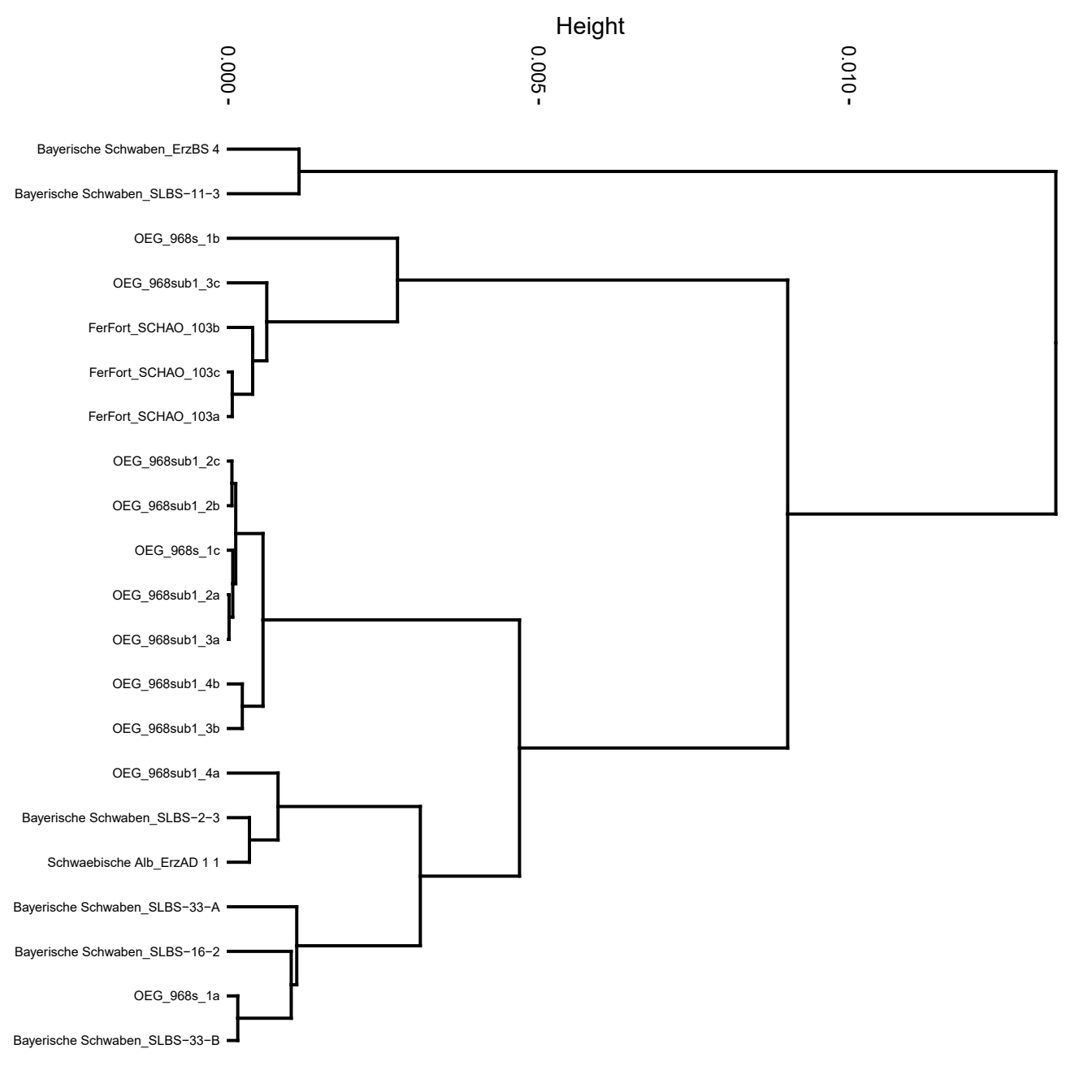

Factor map
FerFort_SCAUD03
Bayerische Schwaben_SLBS−11−3
FerFort_2313
Minette_2420
Bayerische Schwaben_ErzBS 4
Schwaebische Alb_ErzAD 3 3
Bayerische Schwaben_SLBS−16−2
OEG_968sub1_3b
Bayerische Schwaben_SLBS−33−A
Bayerische Schwaben_SLBS−33−B
OEG_968sub1_3a
Schwaebische Alb_ErzOA 4
OEG_968sub1_2a
OEG_968sub1_4b
OEG_968sub1_2b
OEG_968s_1c
FerFort_SCHAO_103a
Bayerische Schwaben_ErzBS 5
FerFort_923
FerFort_SCHAO_103c
OEG_968s_1a
FerFort_SCHAO_103b
OEG_968sub1_3c
Minette_2419
FerFort_2385
Bayerische Schwaben_ErzBS 3
FerFort_SCHAO_108c
FerFort_1287
FerFort_2314
OEG_968sub1_4a
FerFort_934
FerFort_SCAUD02
OEG_968s_1b
Schwaebische Alb_ErzAD 1 1
Minette_2417
Minette_2416
FerFort_SCHAO_106a
Schwaebische Alb_ErzAD 2 2
FerFort_SCHAO_108a
FerFort_935
Barrois_HEV2
Barrois_HEV4
FerFort_SCHAO_108b
Barrois_HEV1
FerFort_SCAUD01
Barrois_SCTREa
Barrois_SCTRE−F1b
Schwaebische Alb_ErzOA 1
FerFort_924
Barrois_HEV3
Barrois_HEV5
Barrois_SCTRE−F2b
Barrois_SCTRE−F2a
Barrois_SCTRE−F1c
Barrois_SCTRE−F3a
Barrois_SCTRE−F1a
Barrois_SCTRE−F3b
cluster
1
2
3
4
5
6
0.6
0.4
0.2
0.0
−0.2
Dim2 (20.4%)
−0.8
−0.4
0.0
0.4
Dim1 (55.9%)

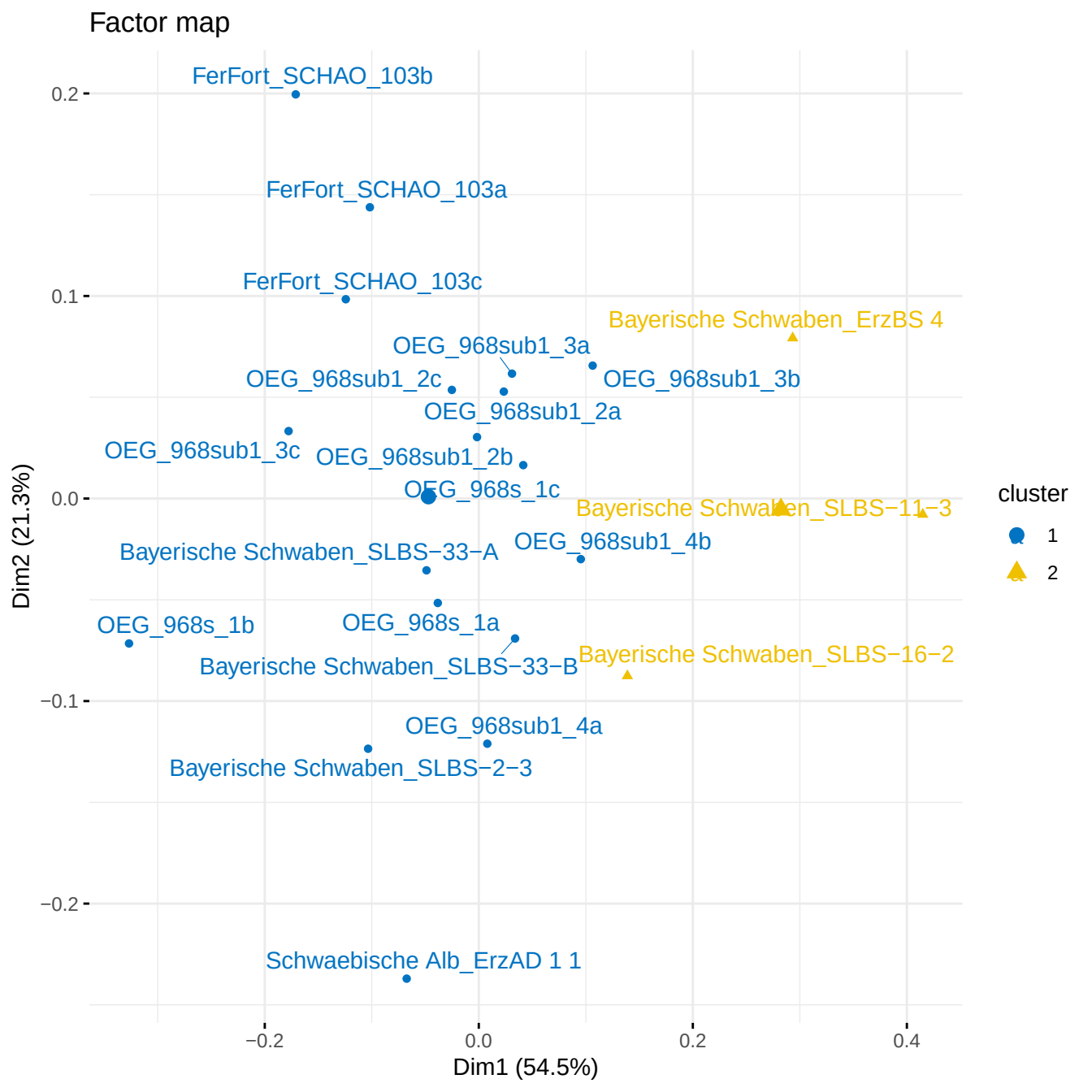

Scree plot
54.5%
21.3%
12%
5.7%
2.8%
1.6%
1%
0.4%
0.3%
0.3%
Percentage of explained variances
0
20
40
1
2
3
4
5
6
7
8
9
10
Dimensions


Variables − PCA
0.050
0.025
0.000
−0.025
Dim2 (21.3%)
0.00
0.05
0.10
Dim1 (54.5%)
Xij_Gd
Xij_Sm
Xij_Dy
Xij_Yb
Xij_U
Xij_Eu
Xij_Nd
Xij_Pr
Xij_Th
Xij_Y
Xij_Ce
Xij_La
contrib
30
20
10

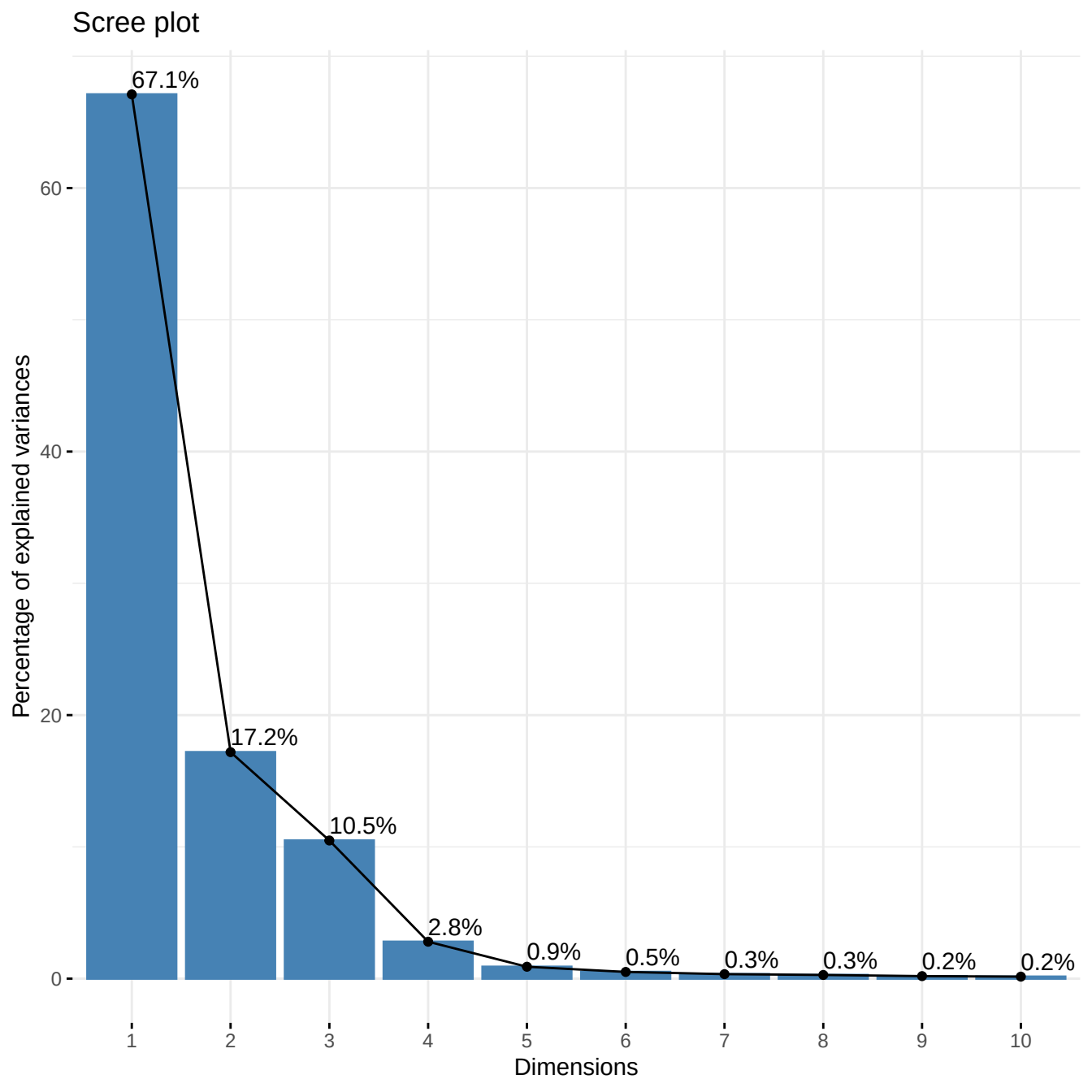

Individuals − PCA
FerFort_SCHAO_103b
FerFort_SCHAO_103a
FerFort_SCHAO_103c
Bayerische Schwaben_ErzBS 4
OEG_968sub1_3a
OEG_968sub1_3b
OEG_968sub1_2c
OEG_968sub1_2a
OEG_968sub1_3c
OEG_968sub1_2b
OEG_968s_1c
Bayerische Schwaben_SLBS−11−3
OEG_968sub1_4b
Bayerische Schwaben_SLBS−33−A
OEG_968s_1a
Bayerische Schwaben_SLBS−33−B
OEG_968s_1b
Bayerische Schwaben_SLBS−16−2
OEG_968sub1_4a
Bayerische Schwaben_SLBS−2−3
Schwaebische Alb_ErzAD 1 1
0.2
0.1
0.0
−0.1
−0.2
−0.2
0.0
0.2
0.4
Dim2 (21.3%)
Dim1 (54.5%)
Groupes
Firestriker
Ore
smelting slag

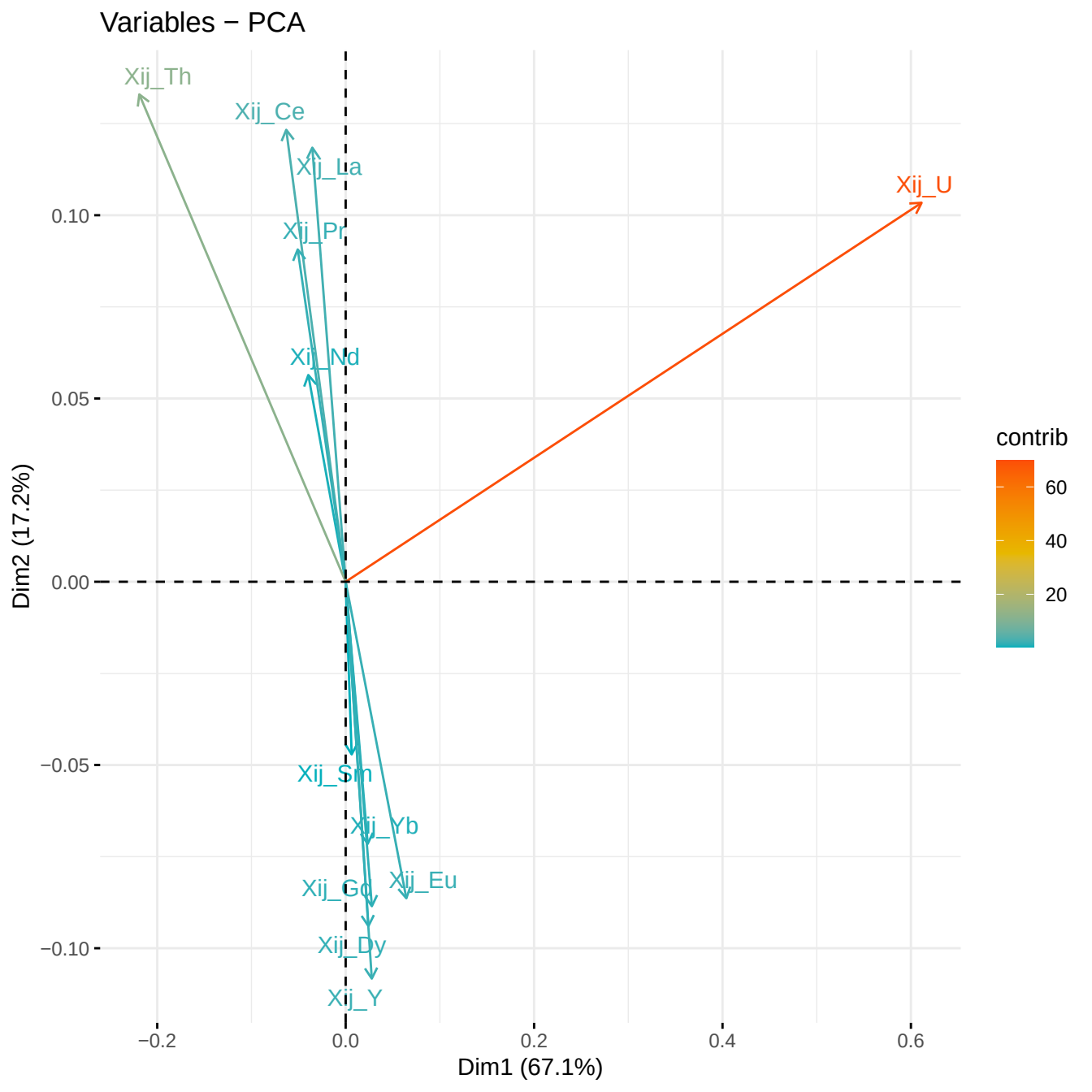

Optimal number of clusters
Gap statistic (k)
0.3
0.2
0.1
1
2
3
4
5
6
7
8
9
10
Number of clusters k

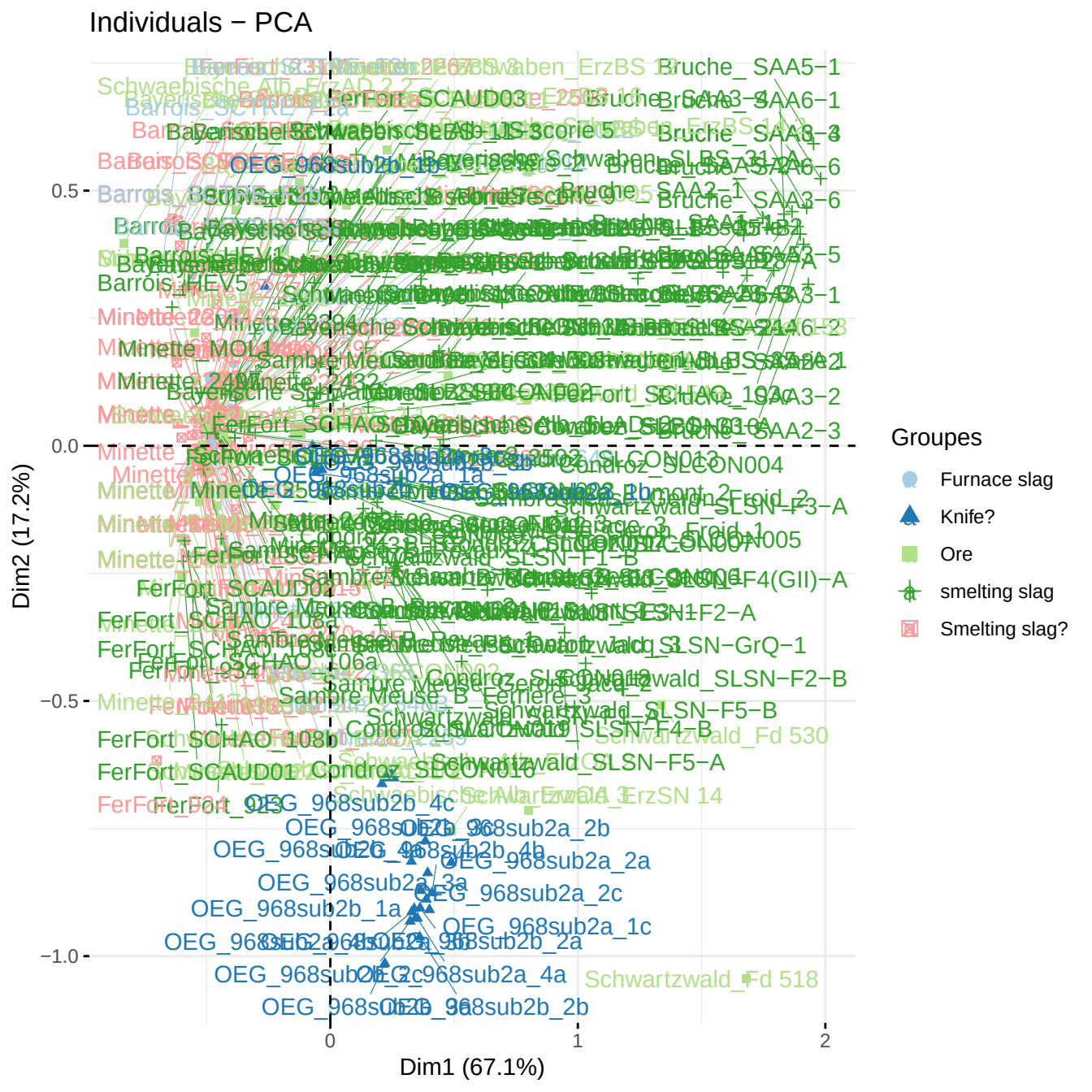

Height
0.000
0.005
0.010
Bayerische Schwaben_ErzBS 4
Bayerische Schwaben_SLBS−11−3
OEG_968s_1b
OEG_968sub1_3c
FerFort_SCHAO_103b
FerFort_SCHAO_103c
FerFort_SCHAO_103a
OEG_968sub1_2c
OEG_968sub1_2b
OEG_968s_1c
OEG_968sub1_2a
OEG_968sub1_3a
OEG_968sub1_4b
OEG_968sub1_3b
OEG_968sub1_4a
Bayerische Schwaben_SLBS−2−3
Schwaebische Alb_ErzAD 1 1
Bayerische Schwaben_SLBS−33−A
Bayerische Schwaben_SLBS−16−2
OEG_968s_1a
Bayerische Schwaben_SLBS−33−B

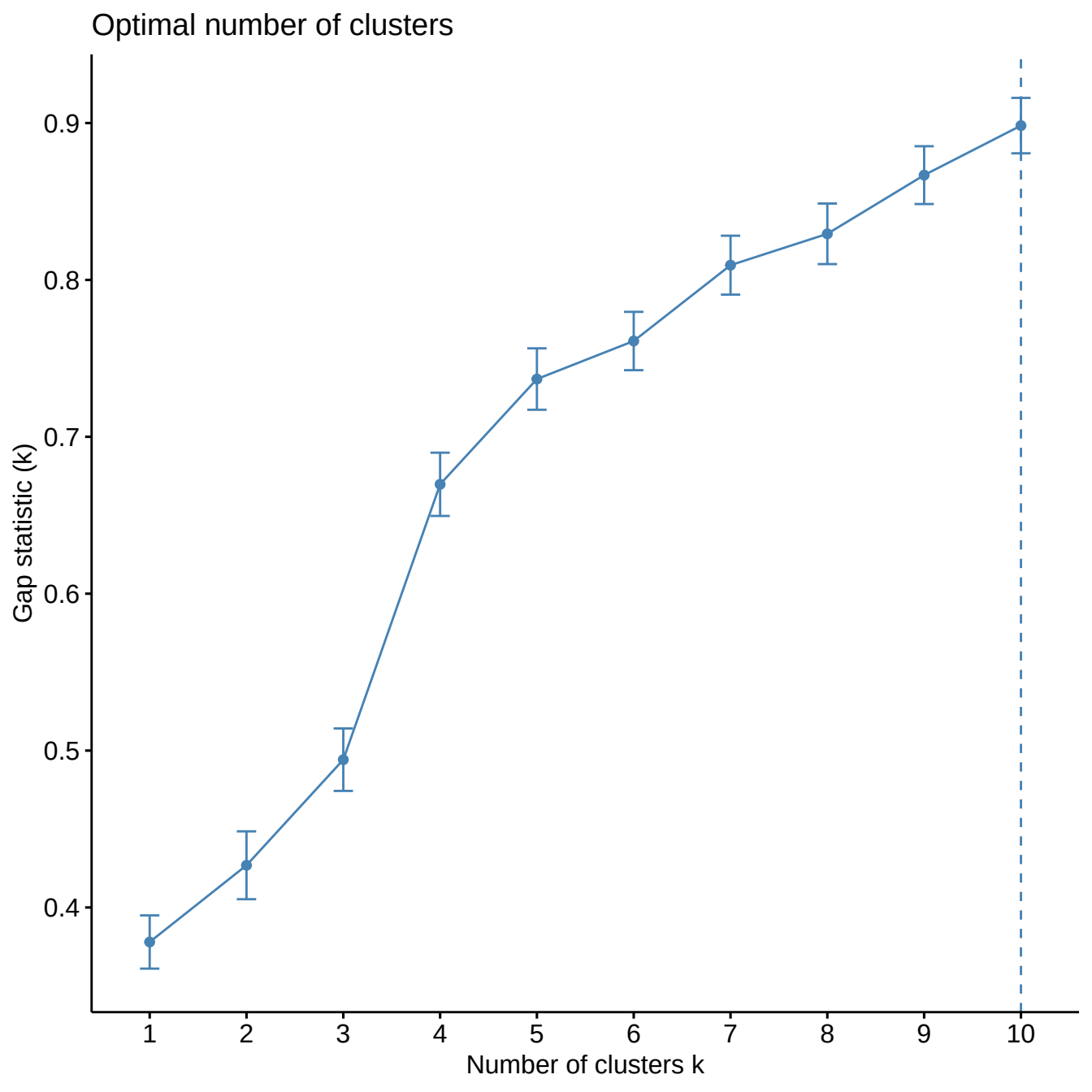

Factor map
FerFort_SCHAO_103b
FerFort_SCHAO_103a
FerFort_SCHAO_103c
Bayerische Schwaben_ErzBS 4
OEG_968sub1_3a
OEG_968sub1_2c
OEG_968sub1_3b
OEG_968sub1_2a
OEG_968sub1_3c
OEG_968sub1_2b
OEG_968s_1c
Bayerische Schwaben_SLBS−11−3
OEG_968sub1_4b
Bayerische Schwaben_SLBS−33−A
OEG_968s_1b
OEG_968s_1a
Bayerische Schwaben_SLBS−33−B
Bayerische Schwaben_SLBS−16−2
OEG_968sub1_4a
Bayerische Schwaben_SLBS−2−3
Schwaebische Alb_ErzAD 1 1
0.2
0.1
0.0
−0.1
−0.2
Dim2 (21.3%)
−0.2
0.0
0.2
0.4
Dim1 (54.5%)
cluster
1
2

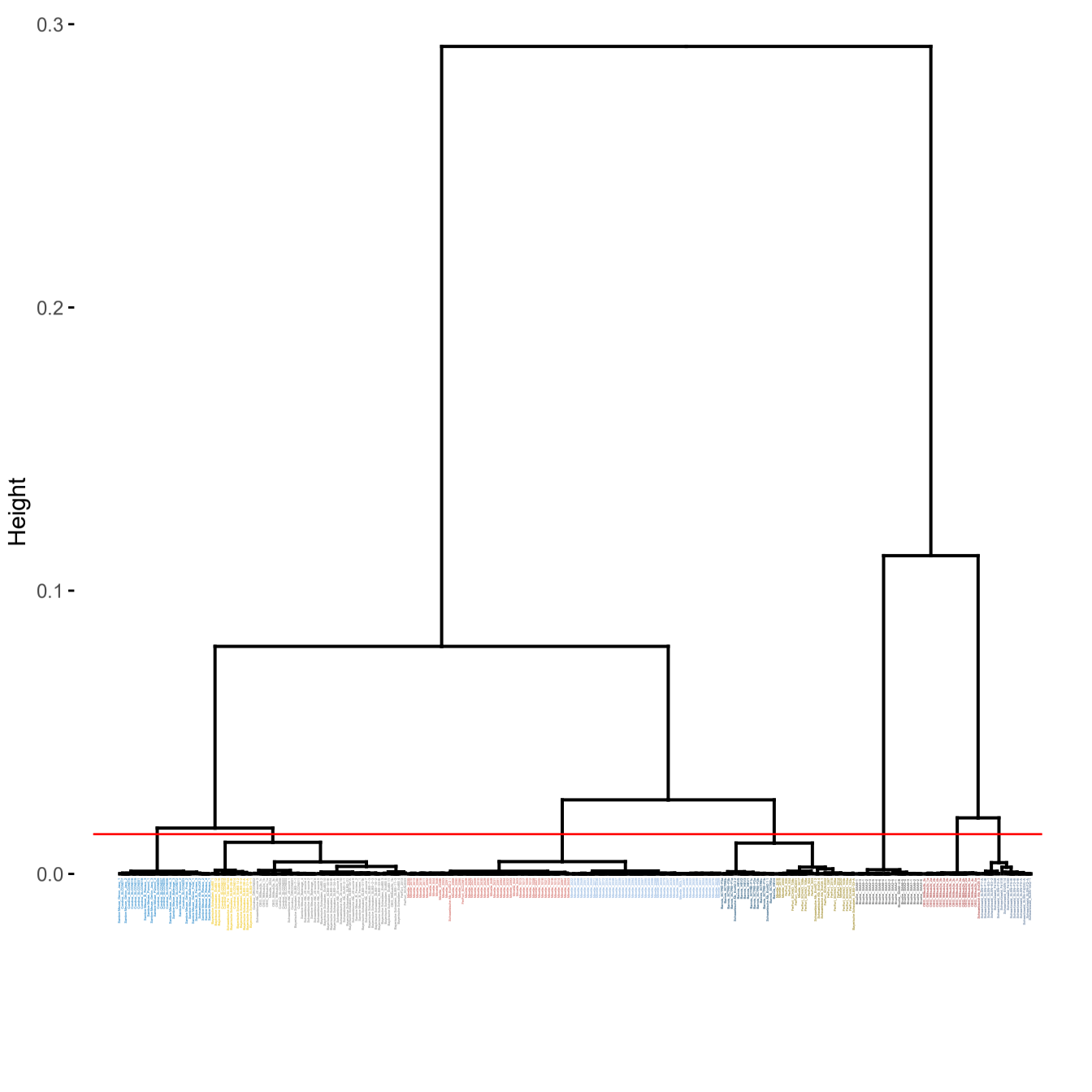
OEG 968 sub 2

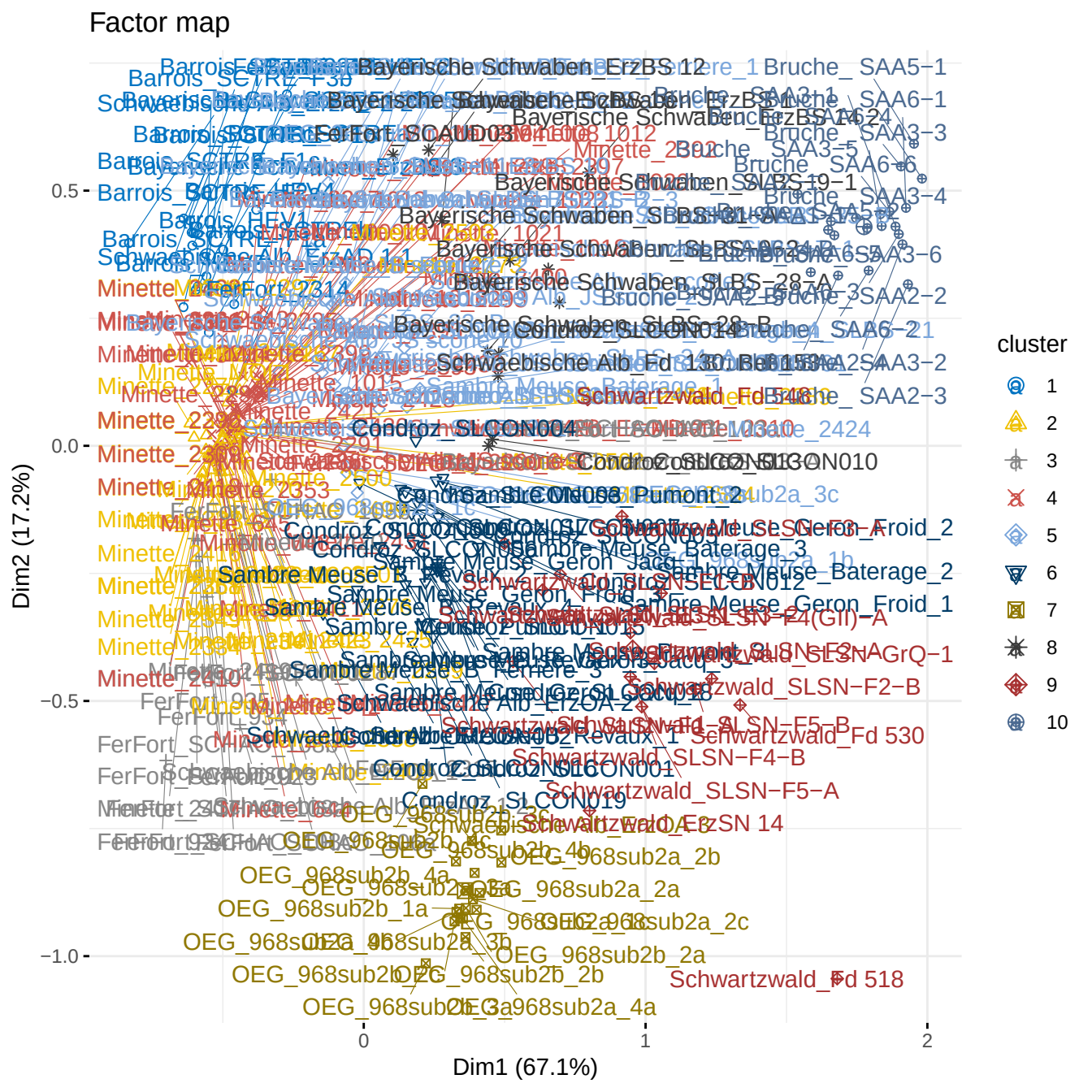

Scree plot
67.1%
17.2%
10.5%
2.8%
0.9%
0.5%
0.3%
0.3%
0.2%
0.2%
Percentage of explained variances
0
20
40
60
1
2
3
4
5
6
7
8
9
10
Dimensions


Variables − PCA
Xij_Th
Xij_Ce
Xij_La
Xij_U
Xij_Pr
Xij_Nd
Xij_Sm
Xij_Yb
Xij_Eu
Xij_Gd
Xij_Dy
Xij_Y
0.10
0.05
0.00
−0.05
−0.10
−0.2
0.0
0.2
0.4
0.6
Dim2 (17.2%)
Dim1 (67.1%)
contrib
60
40
20

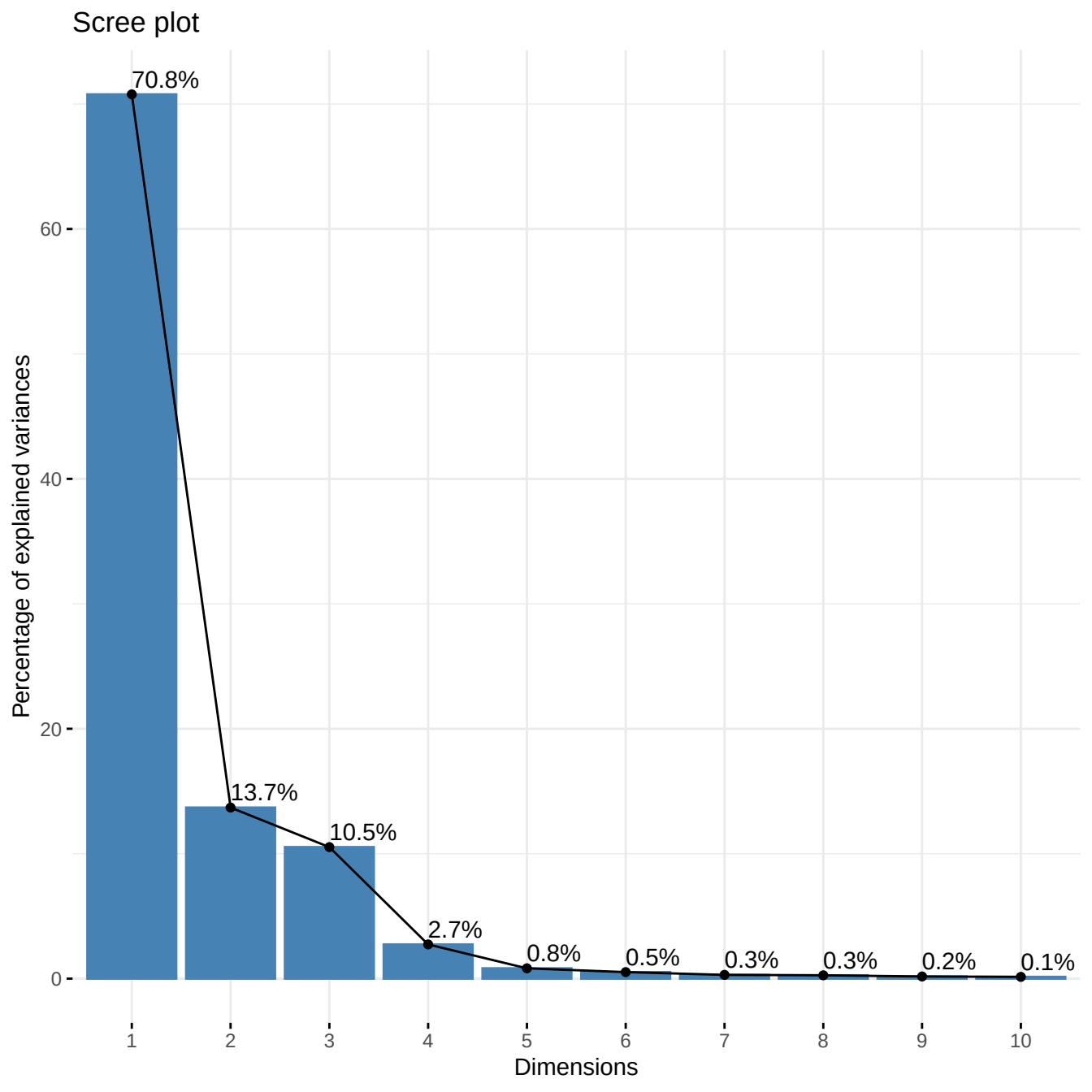

Individuals − PCA
Dim1 (67.1%)
Dim2 (17.2%)
Groupes
Furnace slag
Knife?
Ore
smelting slag
Smelting slag?

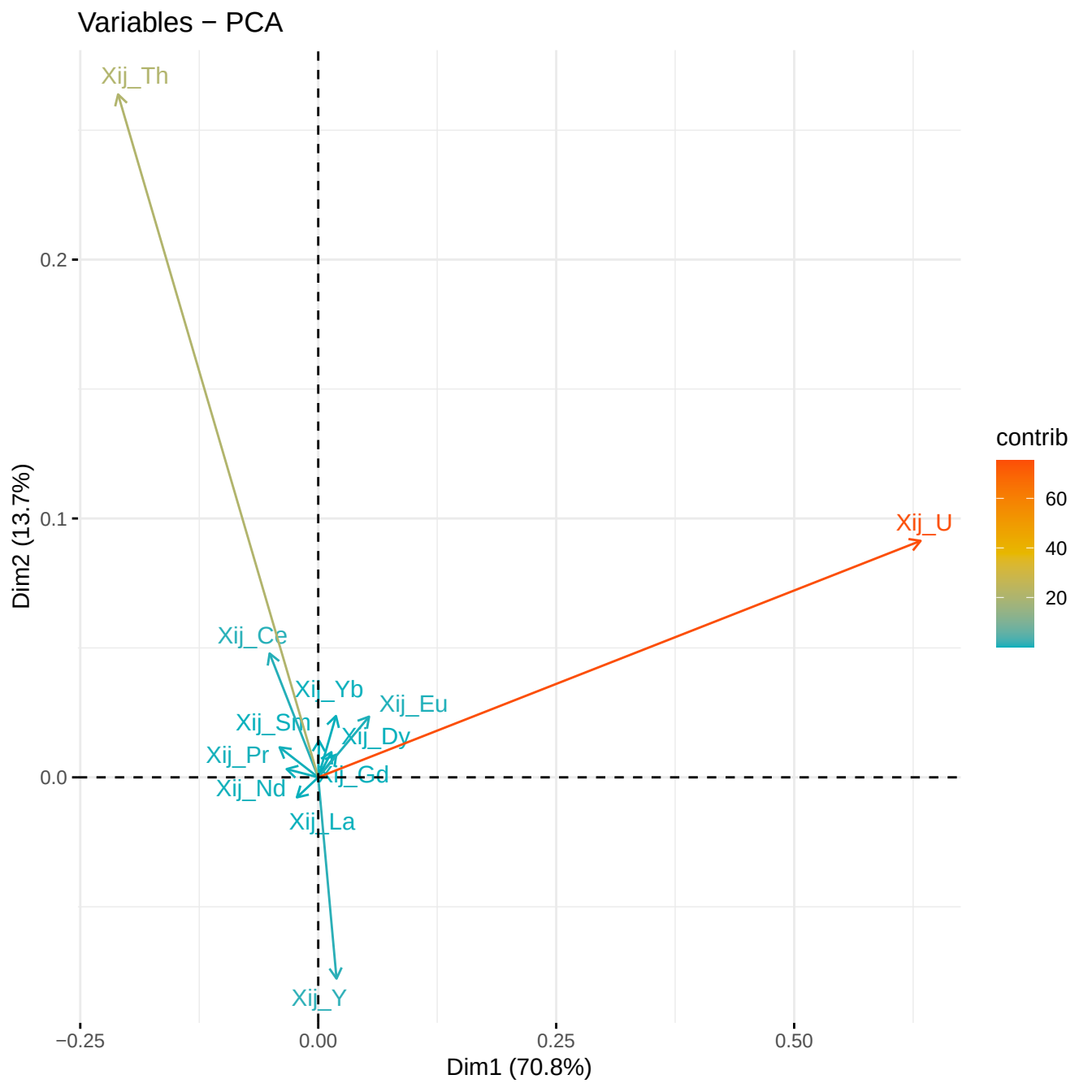

Optimal number of clusters
Gap statistic (k)
0.9
0.8
0.7
0.6
0.5
0.4
1
2
3
4
5
6
7
8
9
10
Number of clusters k

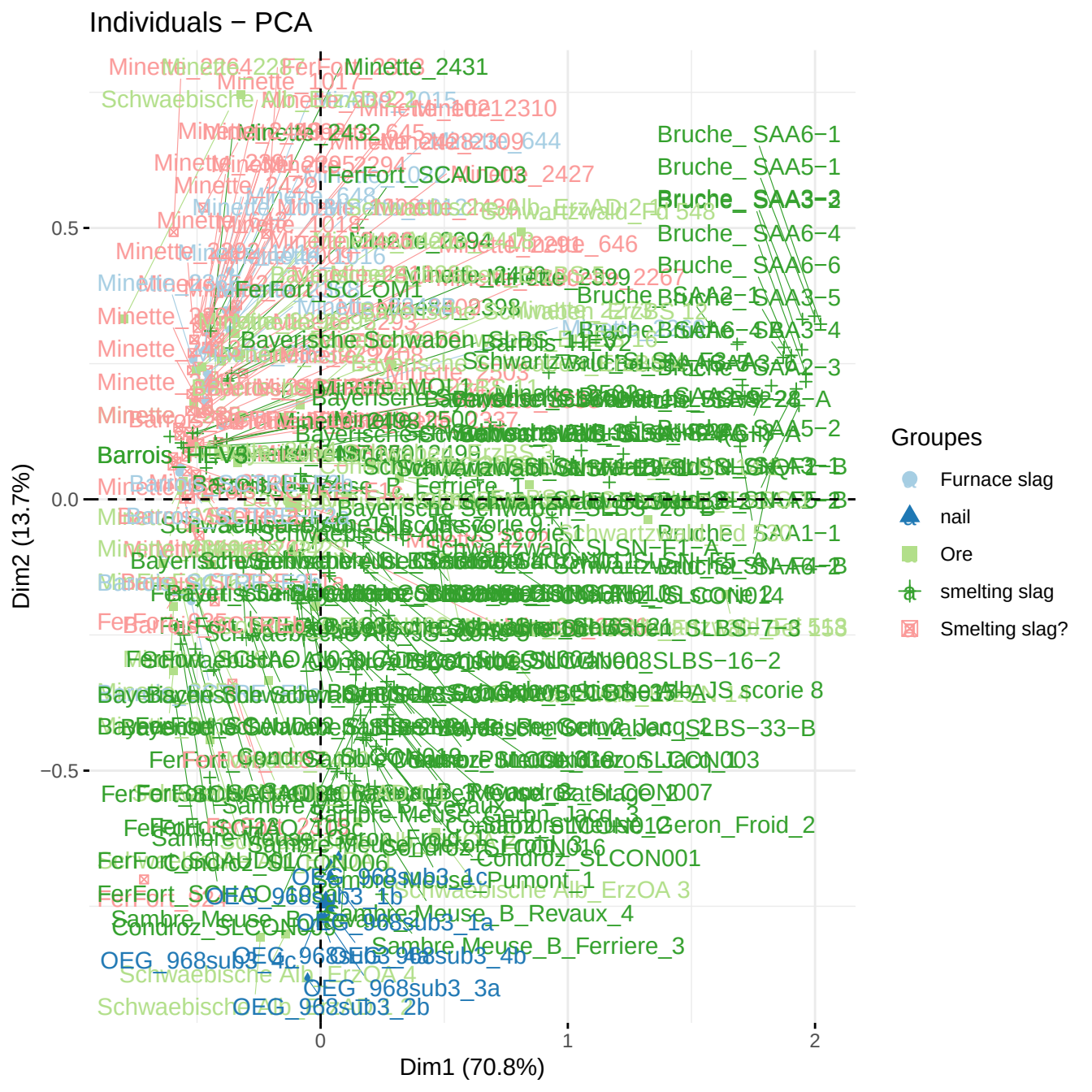

0.3
0.2
0.1
0.0
Height

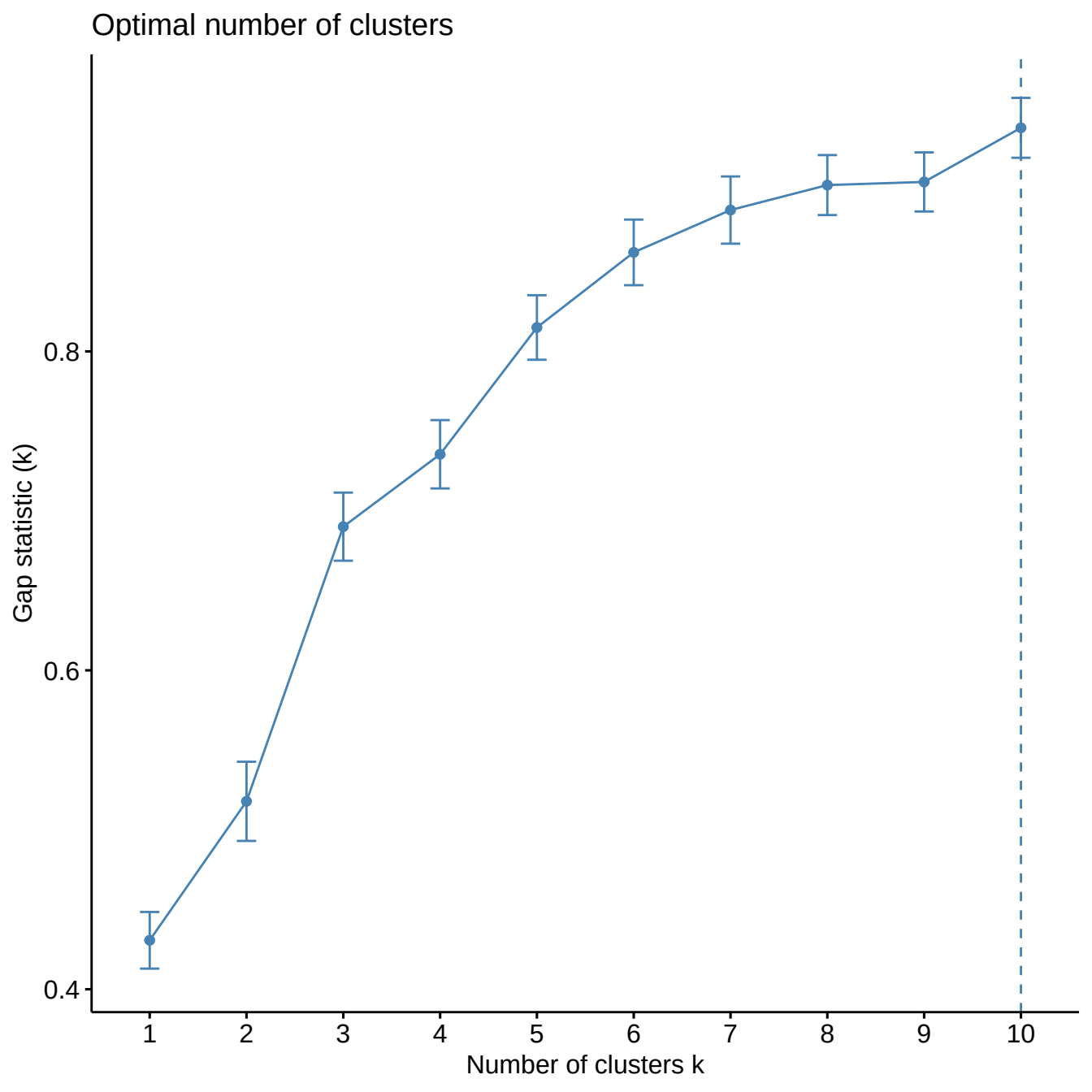

Factor map
Dim2 (17.2%)
Dim1 (67.1%)
cluster
1
2
3
4
5
6
7
8
9
10

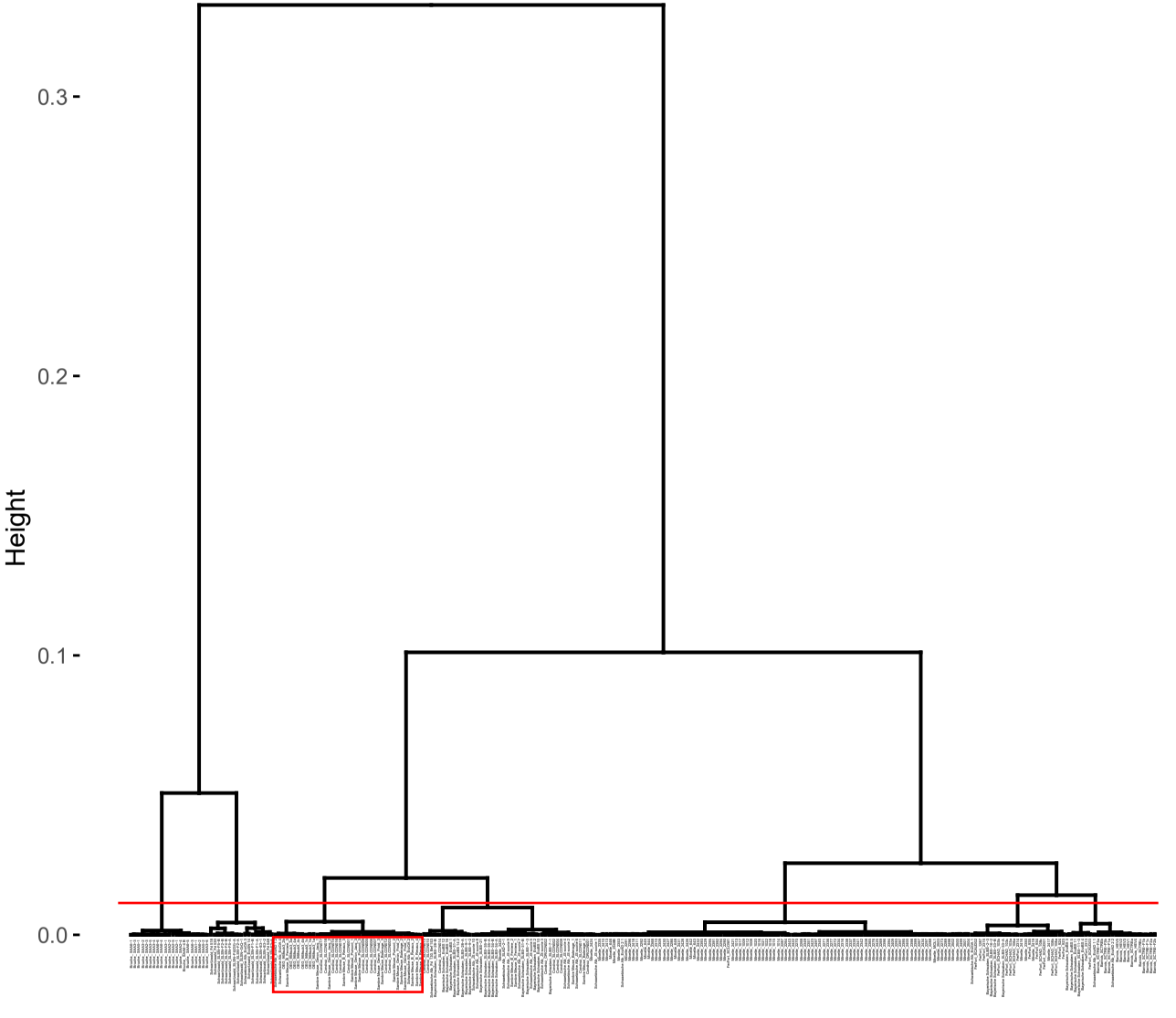
OEG 968 sub 3

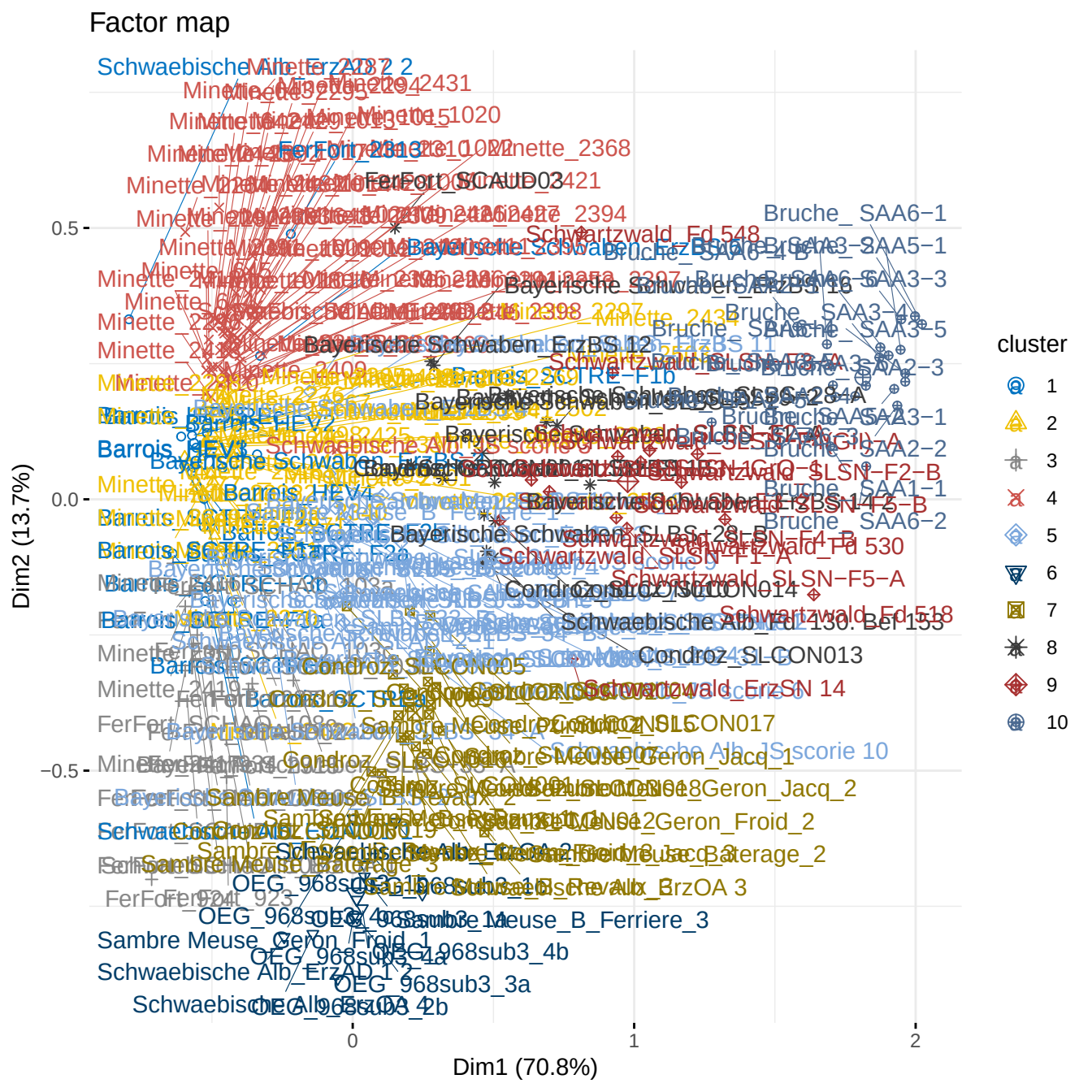

Scree plot
70.8%
13.7%
10.5%
2.7%
0.8%
0.5%
0.3%
0.3%
0.2%
0.1%
Percentage of explained variances
0
20
40
60
1
2
3
4
5
6
7
8
9
10
Dimensions

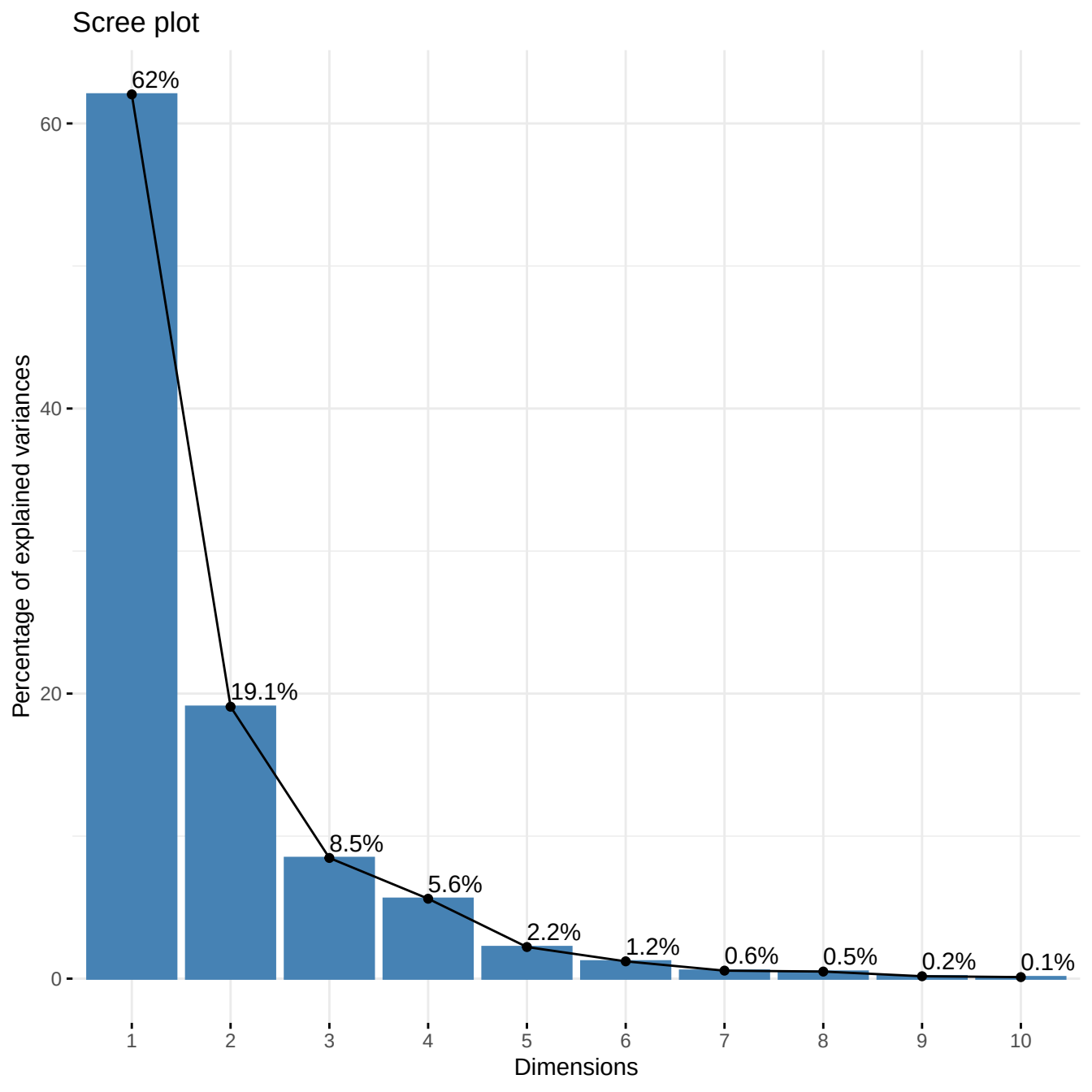

Variables − PCA
Xij_Th
Xij_U
Xij_Ce
Xij_Yb
Xij_Eu
Xij_Sm
Xij_Dy
Xij_Pr
Xij_Gd
Xij_Nd
Xij_La
Xij_Y
contrib
60
40
20
0.2
0.1
0.0
−0.25
0.00
0.25
0.50
Dim2 (13.7%)
Dim1 (70.8%)

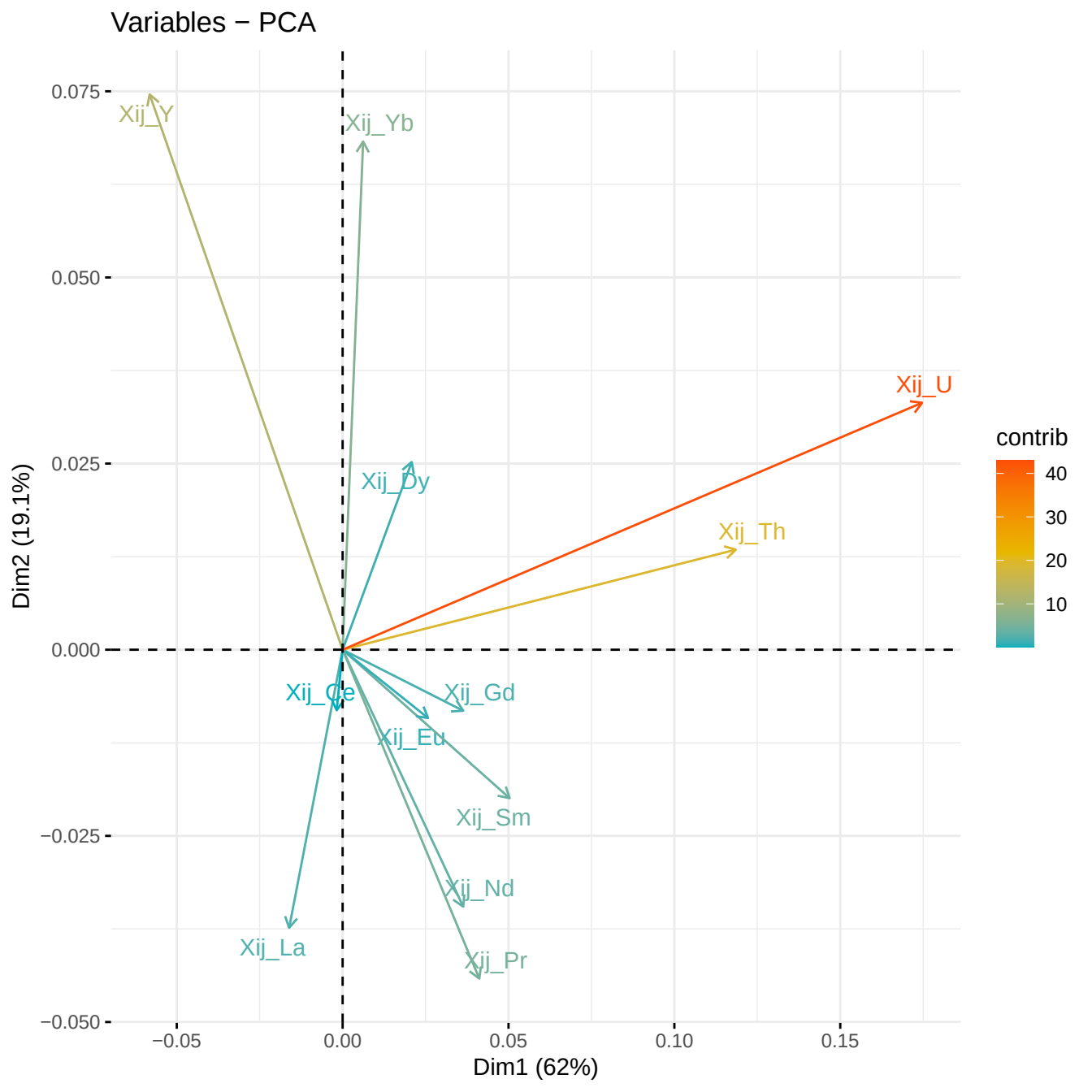

Individuals − PCA
Dim1 (70.8%)
Dim2 (13.7%)
Groupes
Furnace slag
nail
Ore
smelting slag
Smelting slag?

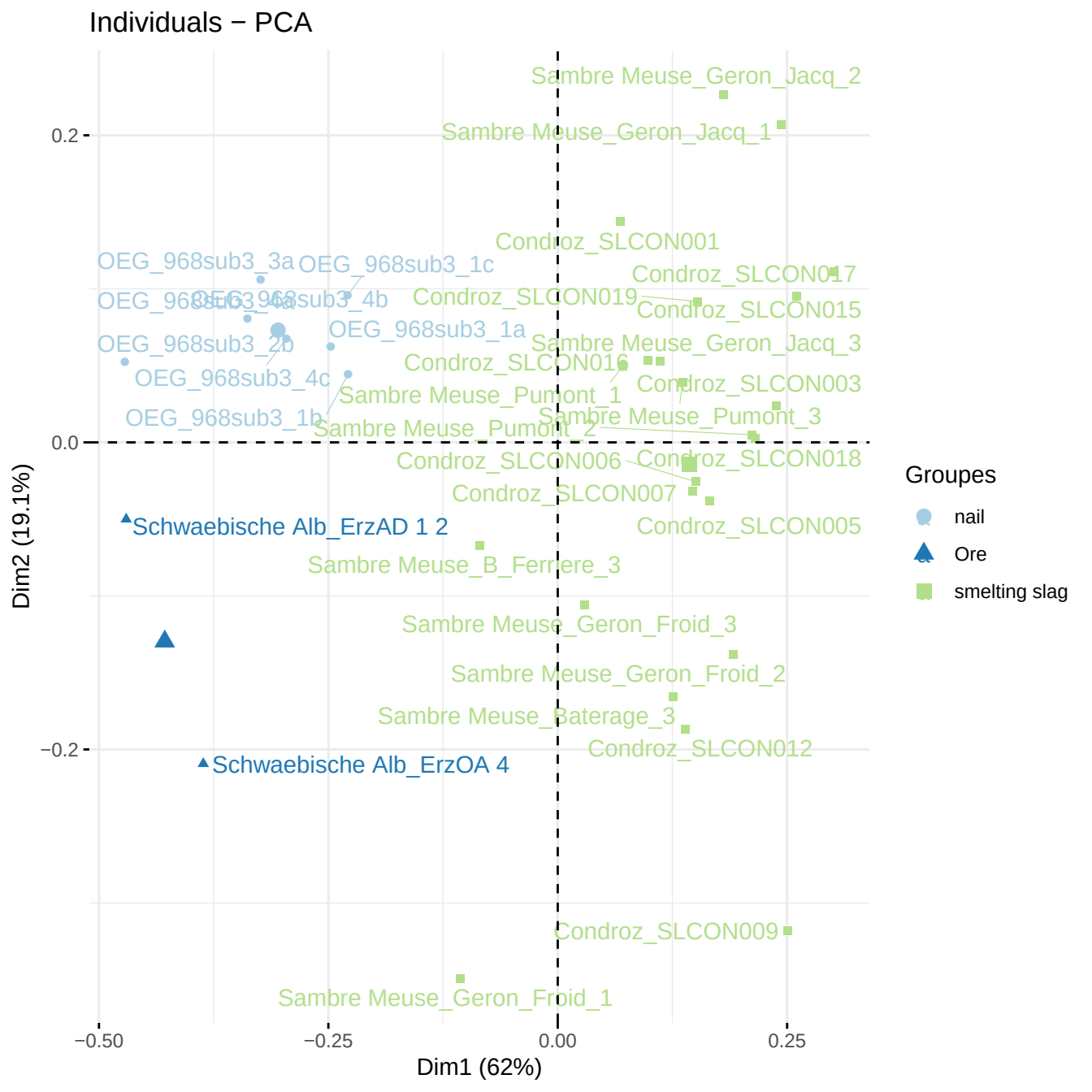

Optimal number of clusters
Gap statistic (k)
0.8
0.6
0.4
1
2
3
4
5
6
7
8
9
10
Number of clusters k

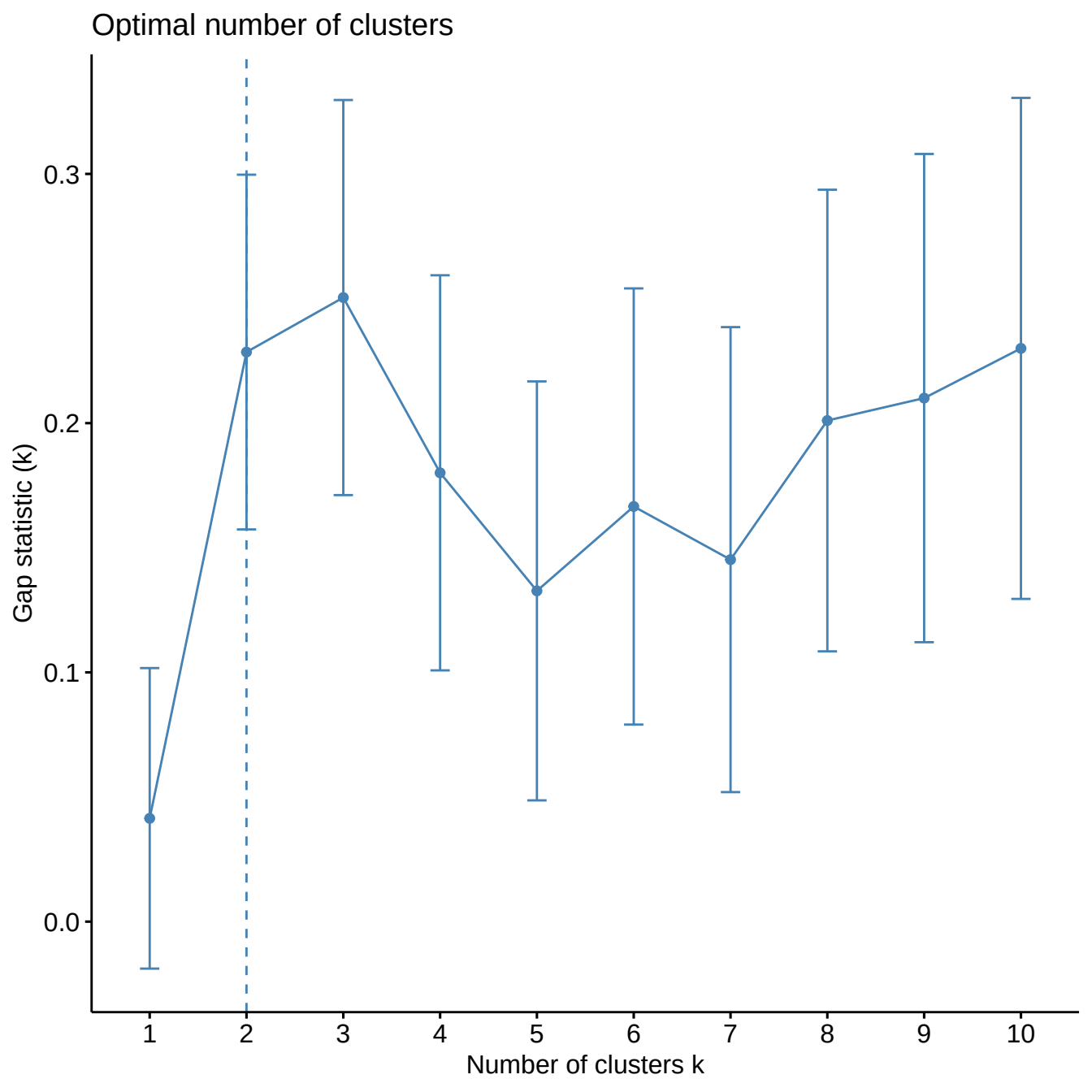

Height
0.3
0.2
0.1
0.0

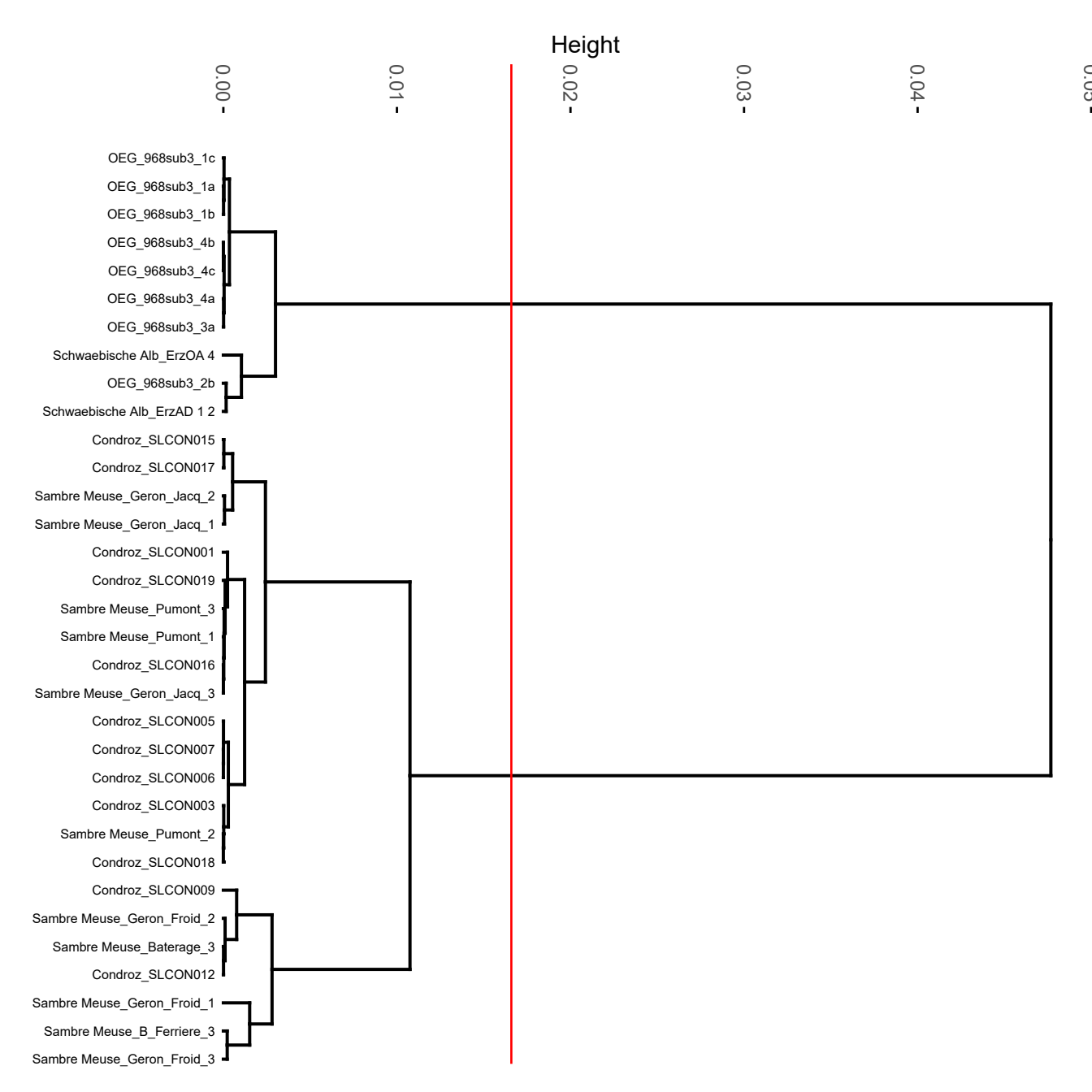

Factor map
Dim2 (13.7%)
Dim1 (70.8%)
0.5
0.0
−0.5
0
1
2
cluster
1
2
3
4
5
6
7
8
9
10

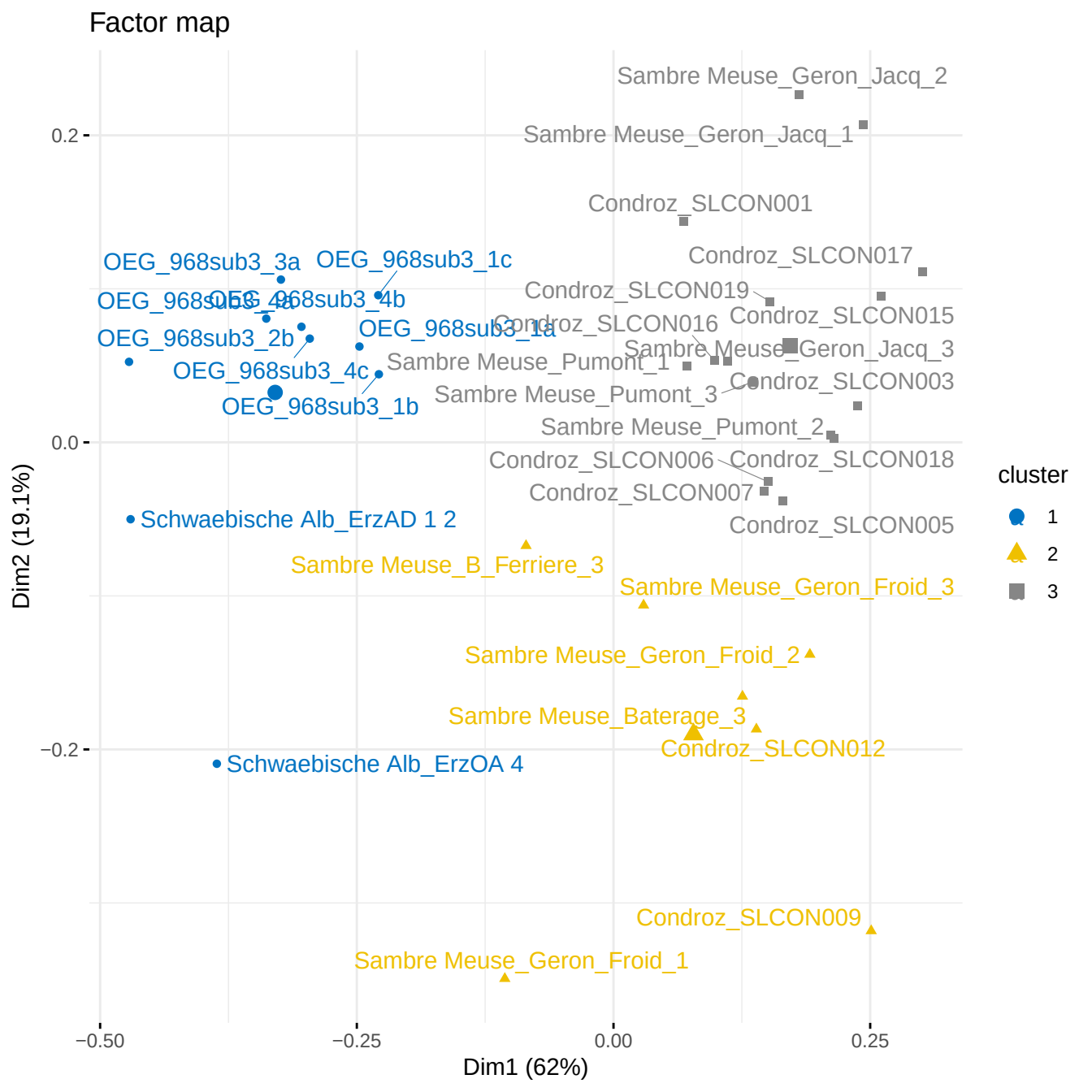

Scree plot
62%
19.1%
8.5%
5.6%
2.2%
1.2%
0.6%
0.5%
0.2%
0.1%
60
40
20
0
Percentage of explained variances
1
2
3
4
5
6
7
8
9
10
Dimensions


Variables − PCA
Xij_Y
Xij_Yb
Xij_U
Xij_Dy
Xij_Th
Xij_Ce
Xij_Gd
Xij_Eu
Xij_Sm
Xij_Nd
Xij_La
Xij_Pr
contrib
40
30
20
10
0.075
0.050
0.025
0.000
−0.025
−0.050
Dim2 (19.1%)
−0.05
0.00
0.05
0.10
0.15
Dim1 (62%)

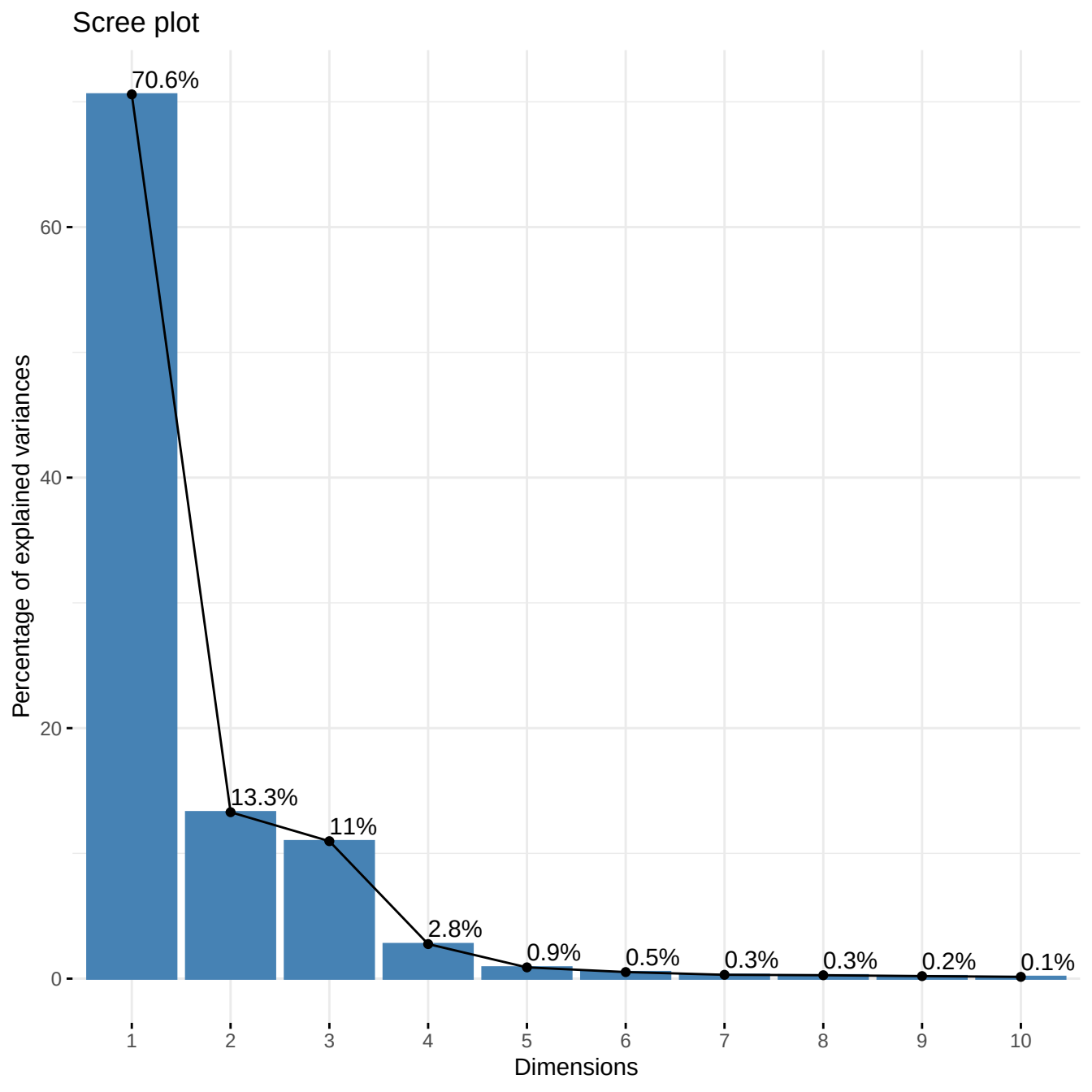

Individuals − PCA
Sambre Meuse_Geron_Jacq_2
Sambre Meuse_Geron_Jacq_1
Condroz_SLCON001
OEG_968sub3_3a
OEG_968sub3_1c
Condroz_SLCON017
OEG_968sub3_4a
OEG_968sub3_4b
Condroz_SLCON019
Condroz_SLCON015
OEG_968sub3_2b
OEG_968sub3_1a
Sambre Meuse_Geron_Jacq_3
Condroz_SLCON016
OEG_968sub3_4c
Condroz_SLCON003
Sambre Meuse_Pumont_1
OEG_968sub3_1b
Sambre Meuse_Pumont_3
Sambre Meuse_Pumont_2
Condroz_SLCON006
Condroz_SLCON018
Condroz_SLCON007
Schwaebische Alb_ErzAD 1 2
Condroz_SLCON005
Sambre Meuse_B_Ferriere_3
Sambre Meuse_Geron_Froid_3
Sambre Meuse_Geron_Froid_2
Sambre Meuse_Baterage_3
Condroz_SLCON012
Schwaebische Alb_ErzOA 4
Condroz_SLCON009
Sambre Meuse_Geron_Froid_1
0.2
0.0
−0.2
−0.50
−0.25
0.00
0.25
Dim2 (19.1%)
Dim1 (62%)
Groupes
nail
Ore
smelting slag

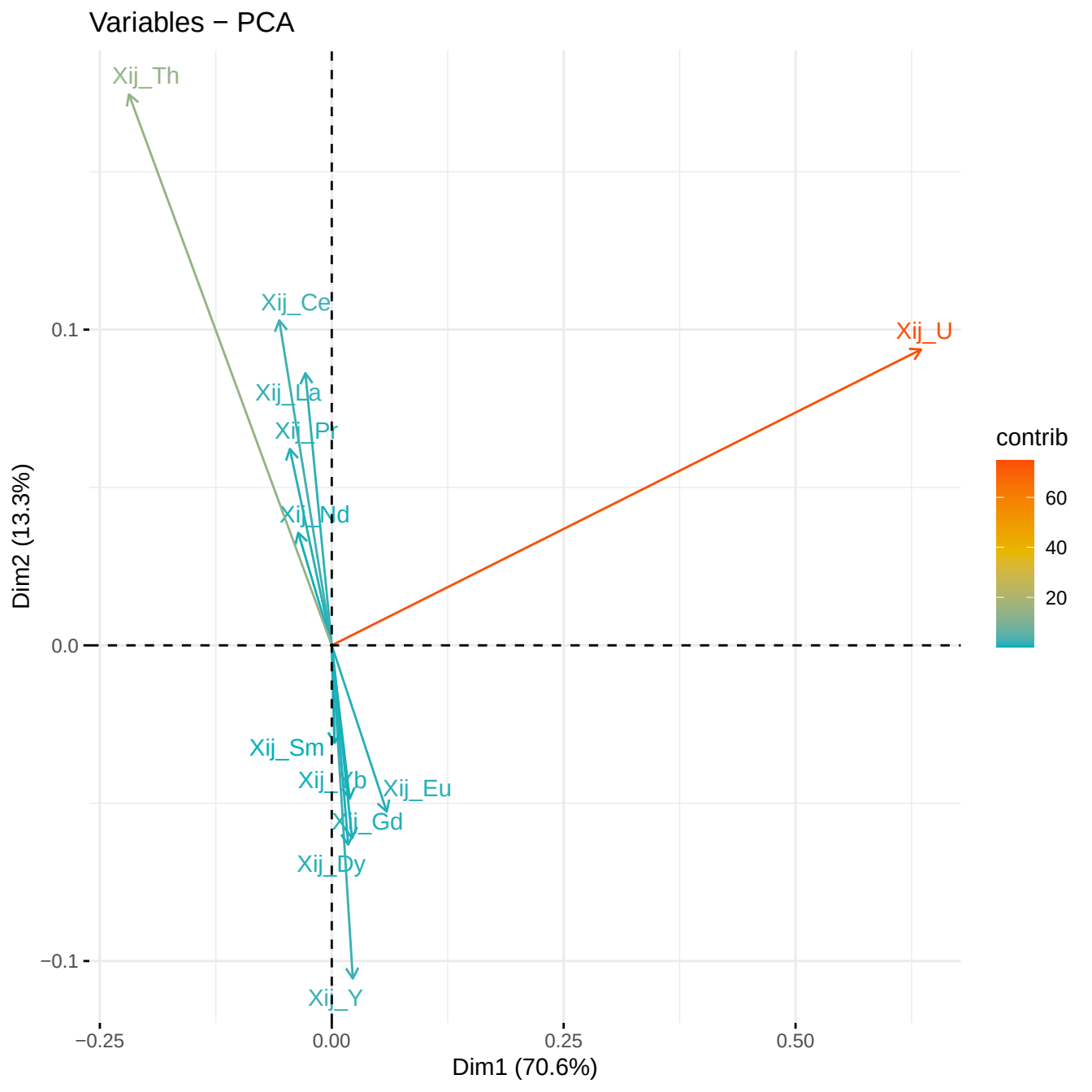

Optimal number of clusters
Gap statistic (k)
0.0
0.1
0.2
0.3
1
2
3
4
5
6
7
8
9
10
Number of clusters k

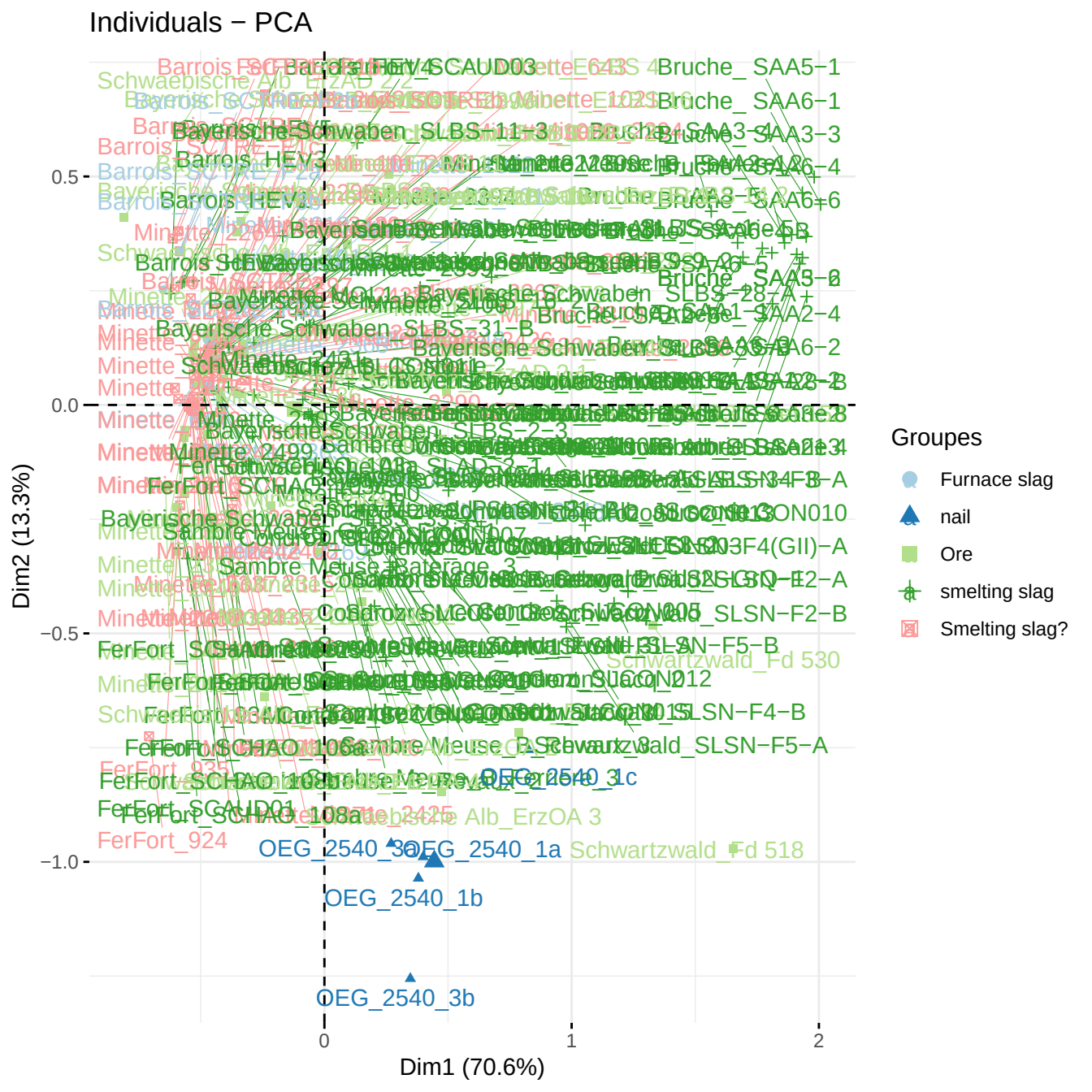

Height
0.00
0.01
0.02
0.03
0.04
0.05
OEG_968sub3_1c
OEG_968sub3_1a
OEG_968sub3_1b
OEG_968sub3_4b
OEG_968sub3_4c
OEG_968sub3_4a
OEG_968sub3_3a
Schwaebische Alb_ErzOA 4
OEG_968sub3_2b
Schwaebische Alb_ErzAD 1 2
Condroz_SLCON015
Condroz_SLCON017
Sambre Meuse_Geron_Jacq_2
Sambre Meuse_Geron_Jacq_1
Condroz_SLCON001
Condroz_SLCON019
Sambre Meuse_Pumont_3
Sambre Meuse_Pumont_1
Condroz_SLCON016
Sambre Meuse_Geron_Jacq_3
Condroz_SLCON005
Condroz_SLCON007
Condroz_SLCON006
Condroz_SLCON003
Sambre Meuse_Pumont_2
Condroz_SLCON018
Condroz_SLCON009
Sambre Meuse_Geron_Froid_2
Sambre Meuse_Baterage_3
Condroz_SLCON012
Sambre Meuse_Geron_Froid_1
Sambre Meuse_B_Ferriere_3
Sambre Meuse_Geron_Froid_3

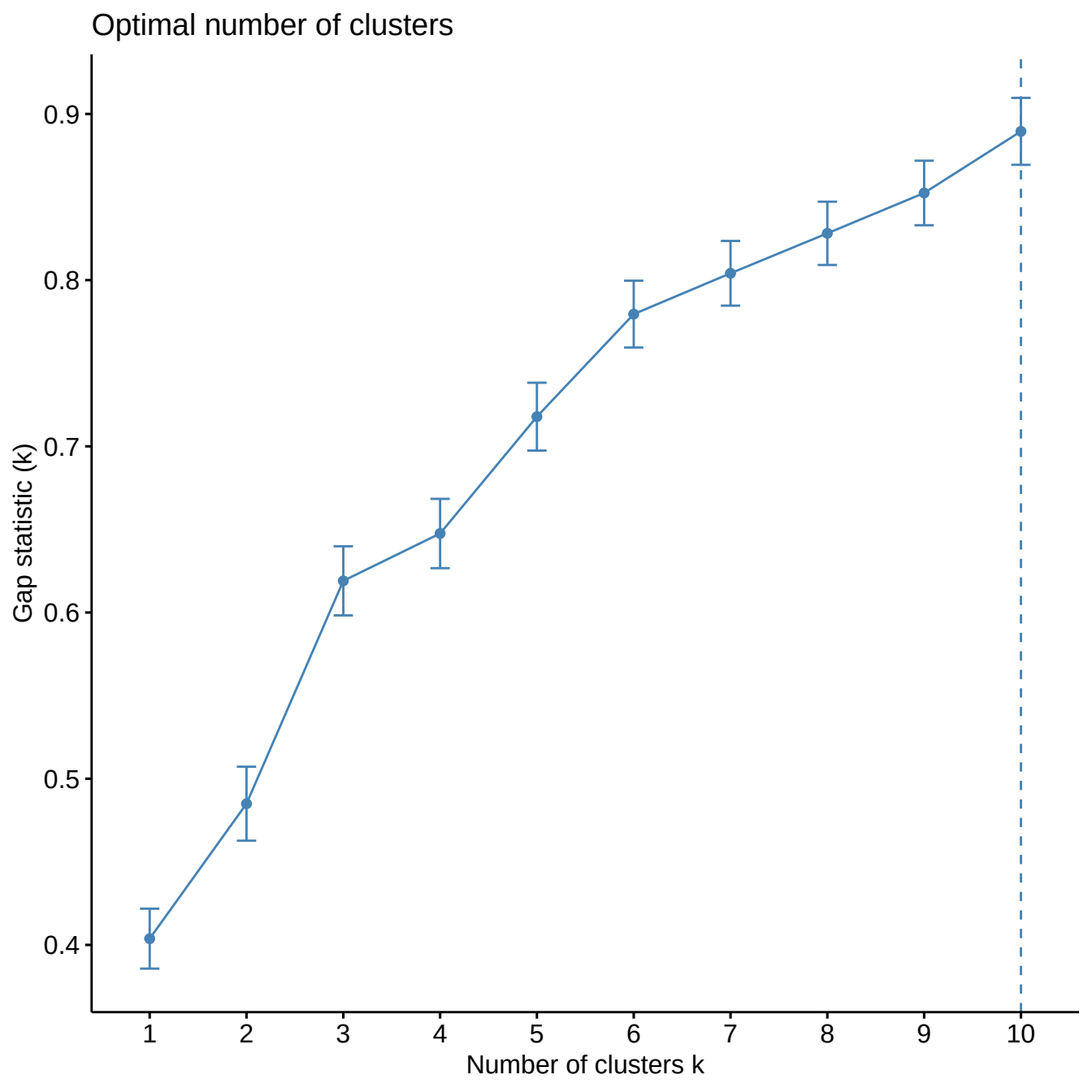

Factor map
Sambre Meuse_Geron_Jacq_2
Sambre Meuse_Geron_Jacq_1
Condroz_SLCON001
Condroz_SLCON017
OEG_968sub3_3a
OEG_968sub3_1c
OEG_968sub3_4a
OEG_968sub3_4b
Condroz_SLCON019
Condroz_SLCON015
Condroz_SLCON016
OEG_968sub3_2b
OEG_968sub3_1a
Sambre Meuse_Geron_Jacq_3
Sambre Meuse_Pumont_1
OEG_968sub3_4c
Condroz_SLCON003
Sambre Meuse_Pumont_3
OEG_968sub3_1b
Sambre Meuse_Pumont_2
Condroz_SLCON006
Condroz_SLCON018
Condroz_SLCON007
Schwaebische Alb_ErzAD 1 2
Condroz_SLCON005
Sambre Meuse_B_Ferriere_3
Sambre Meuse_Geron_Froid_3
Sambre Meuse_Geron_Froid_2
Sambre Meuse_Baterage_3
Condroz_SLCON012
Schwaebische Alb_ErzOA 4
Condroz_SLCON009
Sambre Meuse_Geron_Froid_1
0.2
0.0
−0.2
−0.50
−0.25
0.00
0.25
Dim2 (19.1%)
Dim1 (62%)
cluster
1
2
3

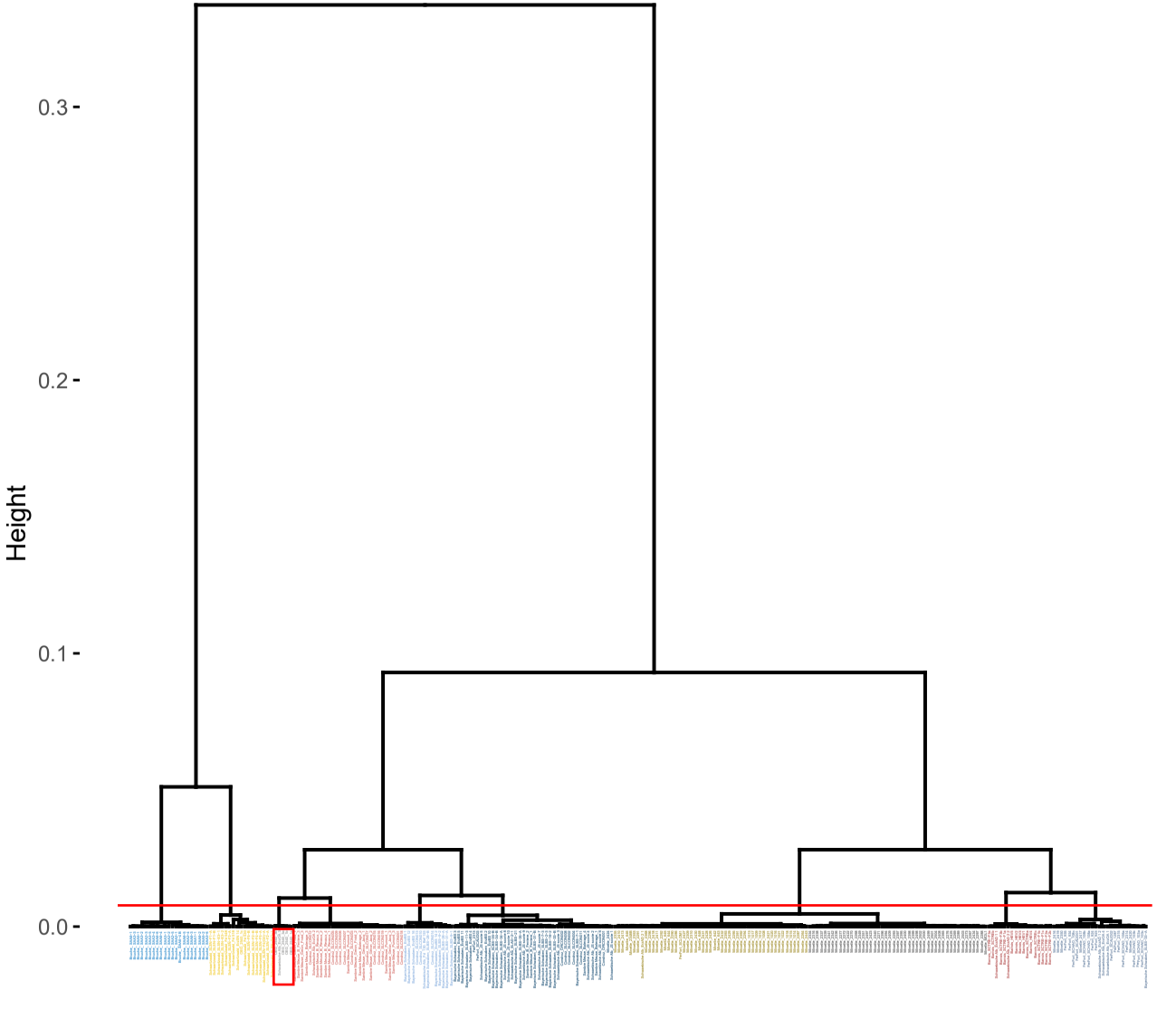
OEG 2540

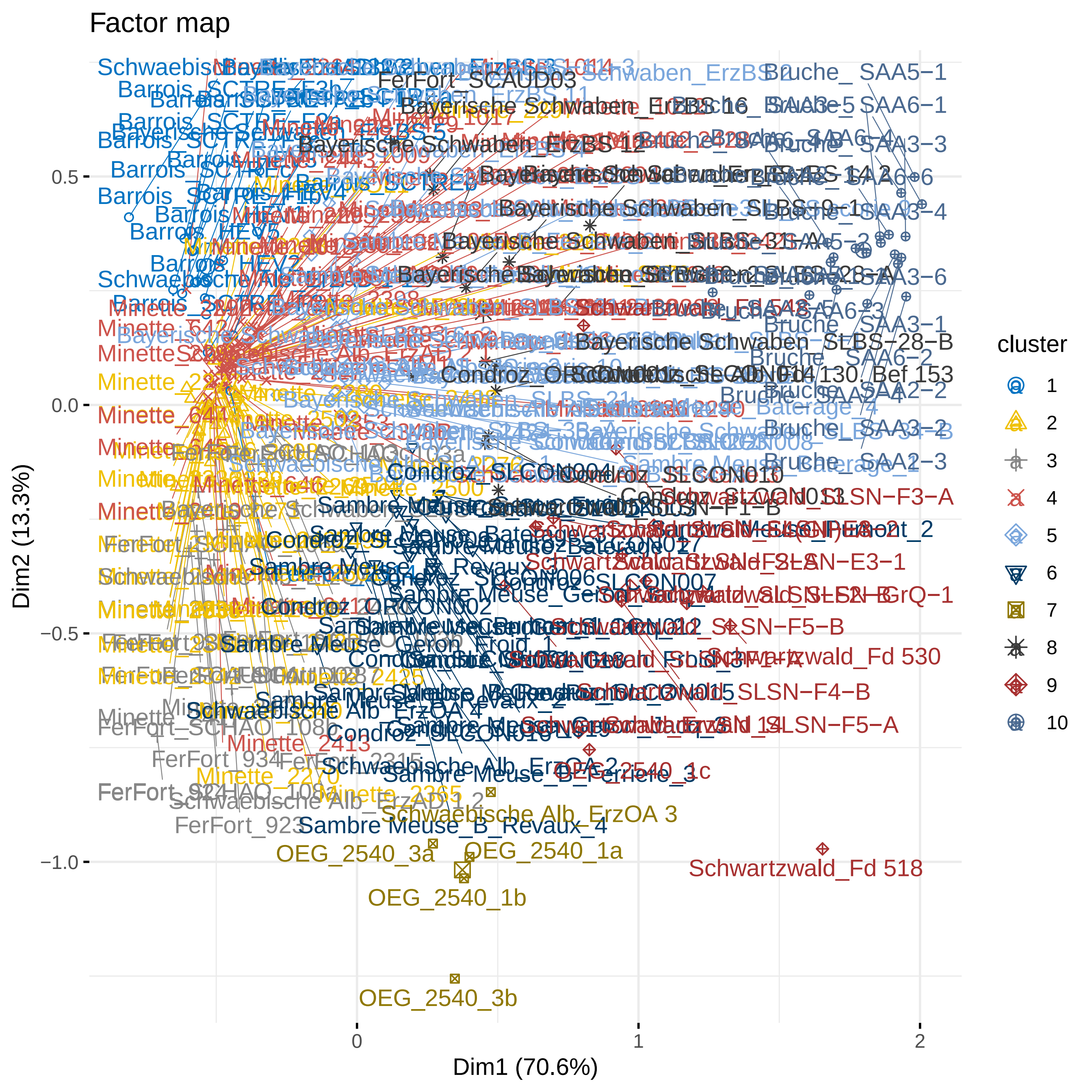

Scree plot
70.6%
13.3%
11%
2.8%
0.9%
0.5%
0.3%
0.3%
0.2%
0.1%
Percentage of explained variances
0
20
40
60
1
2
3
4
5
6
7
8
9
10
Dimensions


Variables − PCA
Xij_Th
Xij_Ce
Xij_U
Xij_La
Xij_Pr
Xij_Nd
Xij_Sm
Xij_Tb
Xij_Eu
Xij_Gd
Xij_Dy
Xij_Y
contrib
60
40
20
0.1
0.0
−0.1
−0.25
0.00
0.25
0.50
Dim2 (13.3%)
Dim1 (70.6%)


Individuals − PCA
Dim2 (13.3%)
Dim1 (70.6%)
0.5
0.0
−0.5
−1.0
0
1
2
Groupes
Furnace slag
nail
Ore
smelting slag
Smelting slag?
OEG_2540_3a
OEG_2540_1a
OEG_2540_1b
OEG_2540_3b
Schwartzwald_Fd 518
Schwartzwald_Fd 530

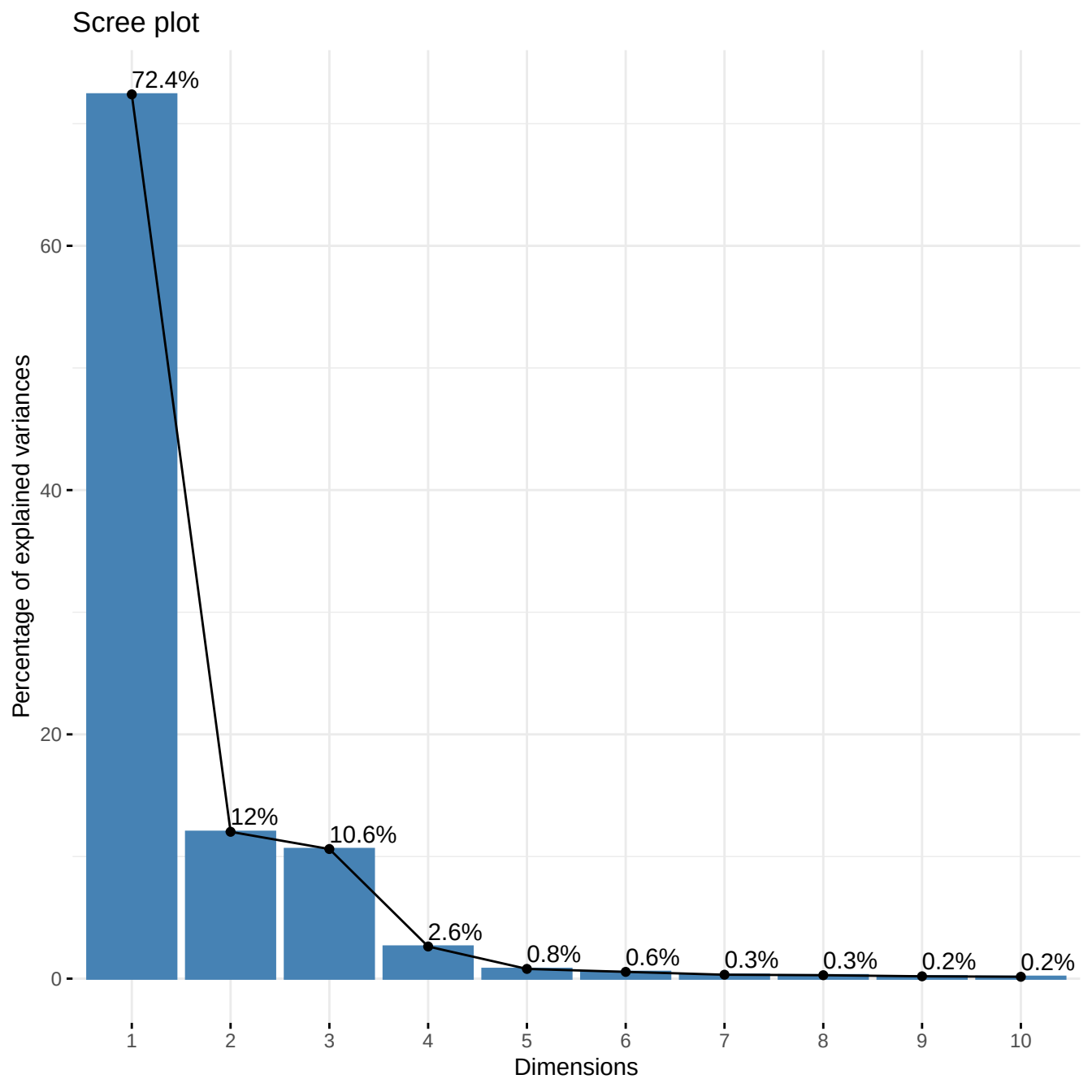

Optimal number of clusters
Gap statistic (k)
0.9
0.8
0.7
0.6
0.5
0.4
1
2
3
4
5
6
7
8
9
10
Number of clusters k

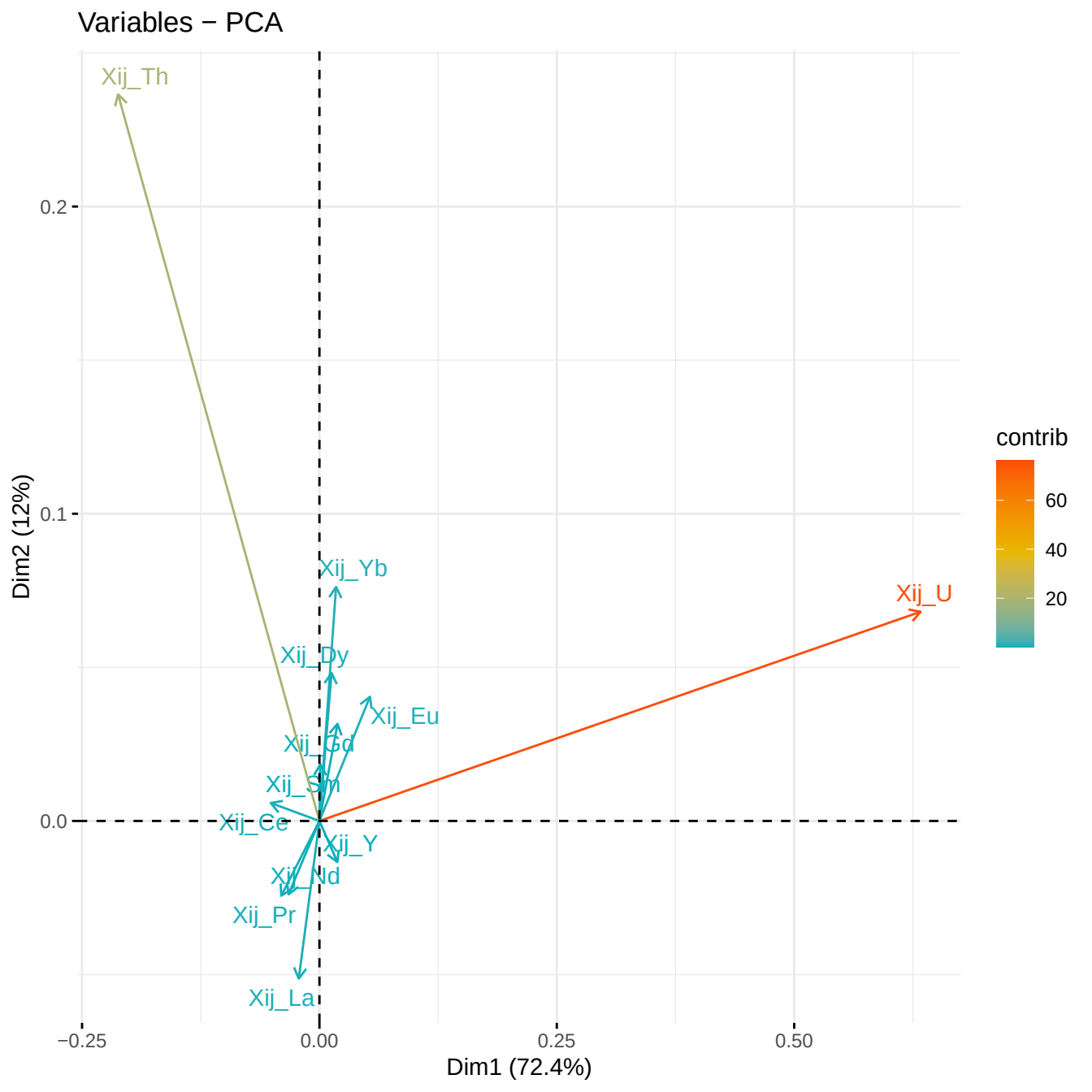

Height
0.3
0.2
0.1
0.0

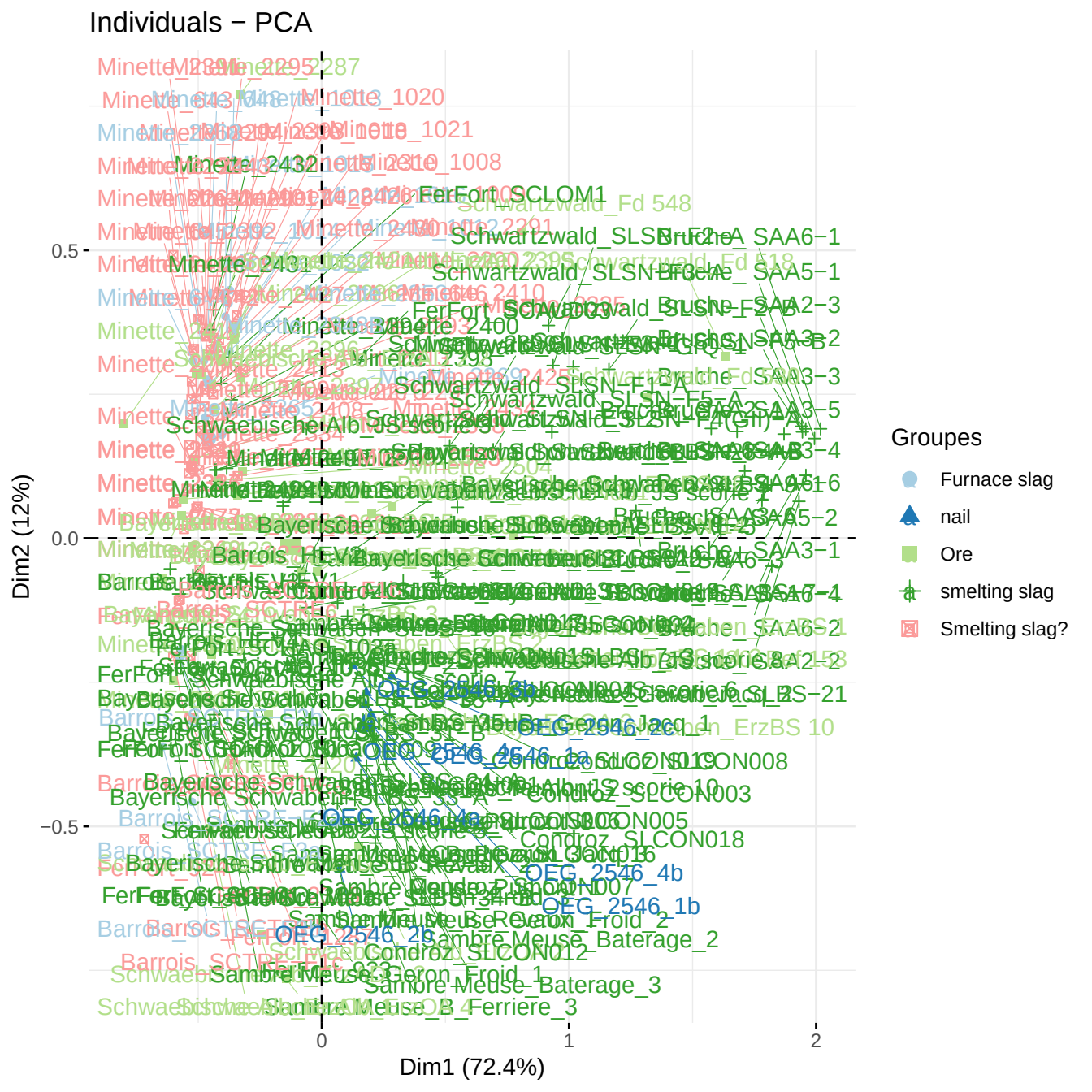


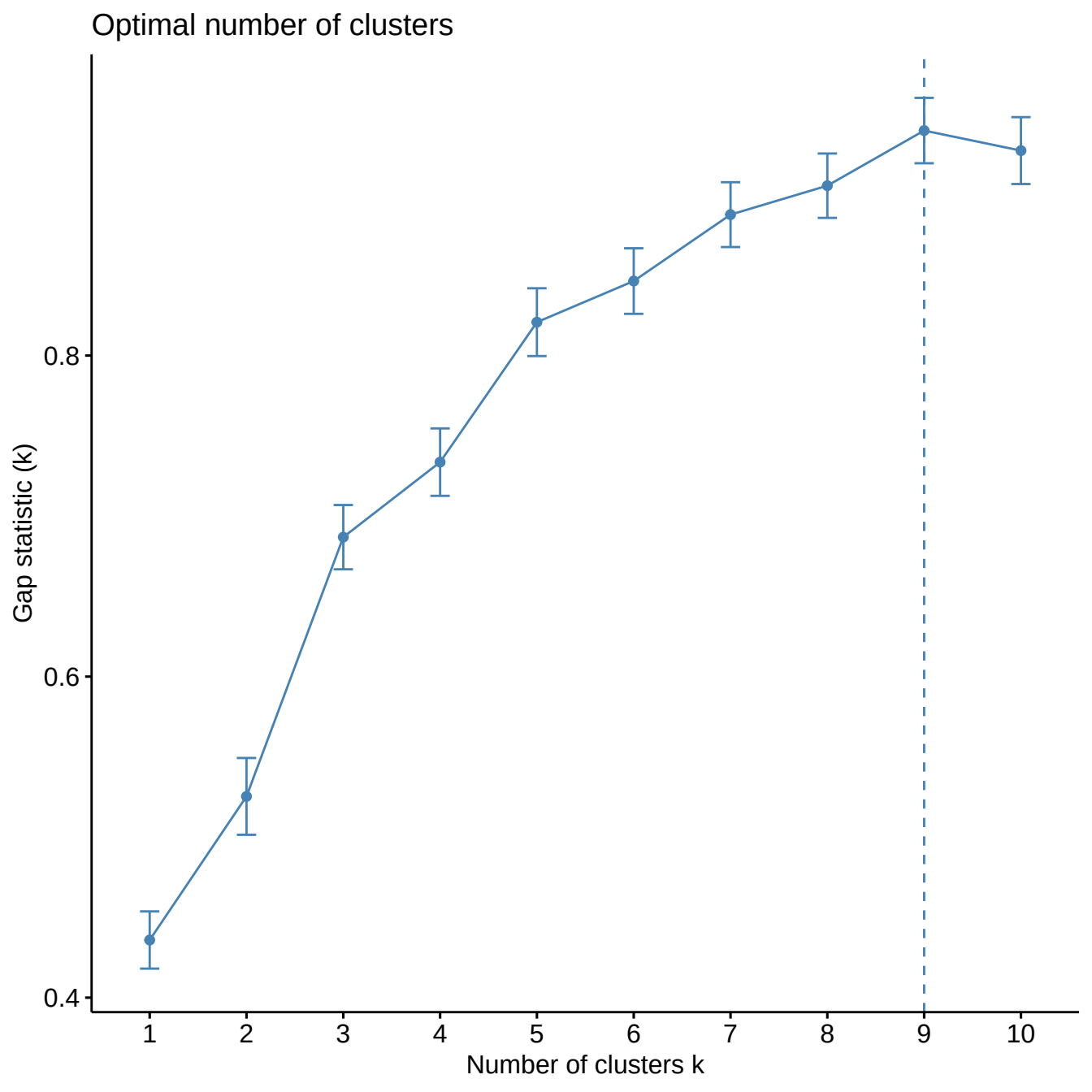
Factor map
Dim1 (70.6%)
Dim2 (13.3%)
0.5
0.0
−0.5
−1.0
0
1
2
cluster
1
2
3
4
5
6
7
8
9
10
Bruche_ SAA5−1
Bruche_ SAA6−1
Bruche_ SAA3−3
Bruche_ SAA3−4
Bruche_ SAA3−6
Bruche_ SAA3−1
Bruche_ SAA6−2
Bruche_ SAA2−2
Bruche_ SAA2−3
FerFort_SCAUD03
Bayerische Schwaben_SLBS−28−B
Schwartzwald_SLSN−F3−A
Schwartzwald_SLSN−F5−B
Schwartzwald_Fd 530
Schwartzwald_SLSN−F4−B
Schwartzwald_SLSN−F5−A
Schwartzwald_Fd 518
Schwaebische Alb_ErzOA 3
Sambre Meuse_B_Revaux_4
OEG_2540_3a
OEG_2540_1a
OEG_2540_1b
OEG_2540_3b
FerFort_SCHAO_108b
Minette_2413
FerFort_923
Barrois_HEV5
Barrois_HEV2
Minette_642
Minette_641
Minette_645

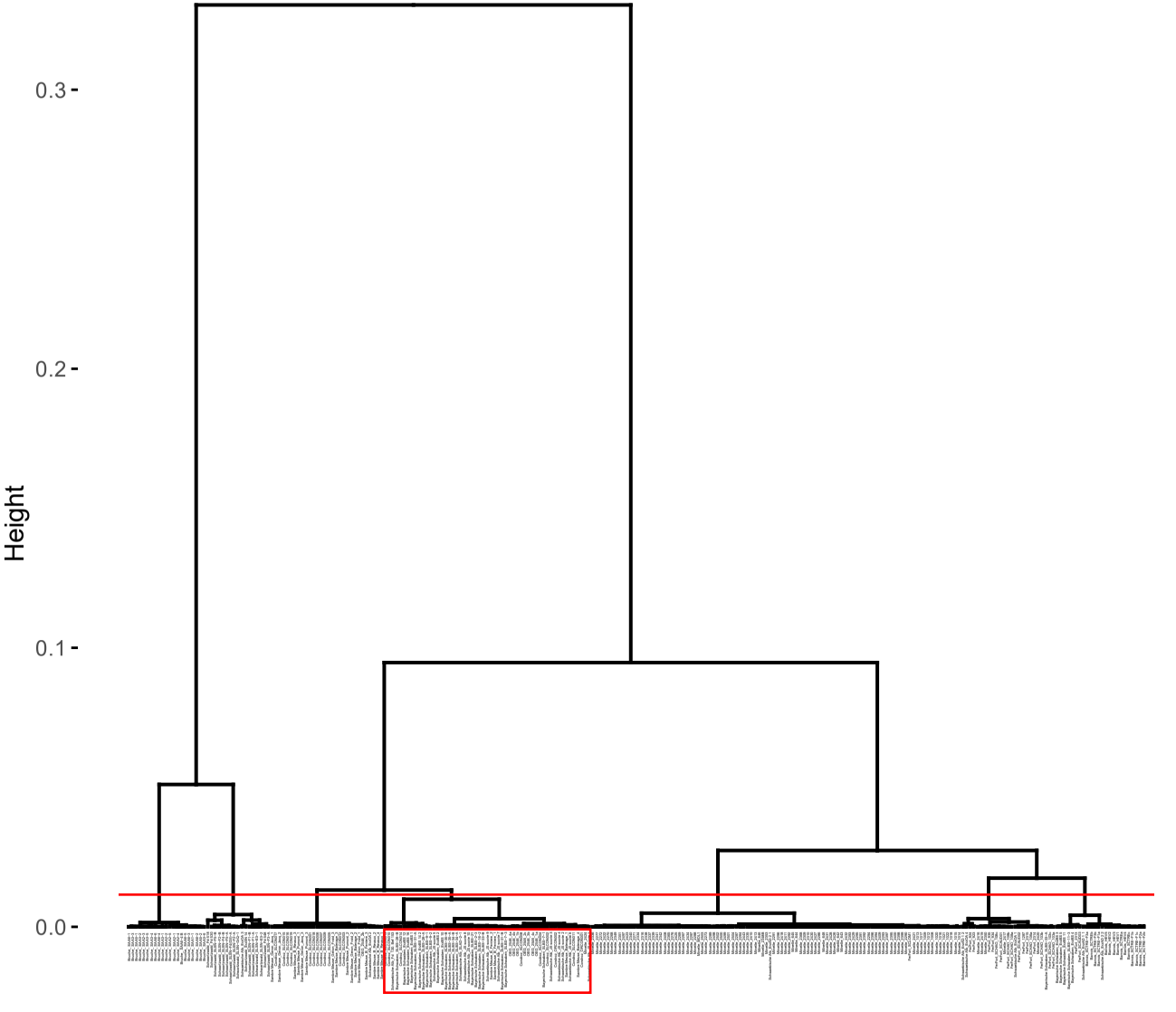
OEG 2546

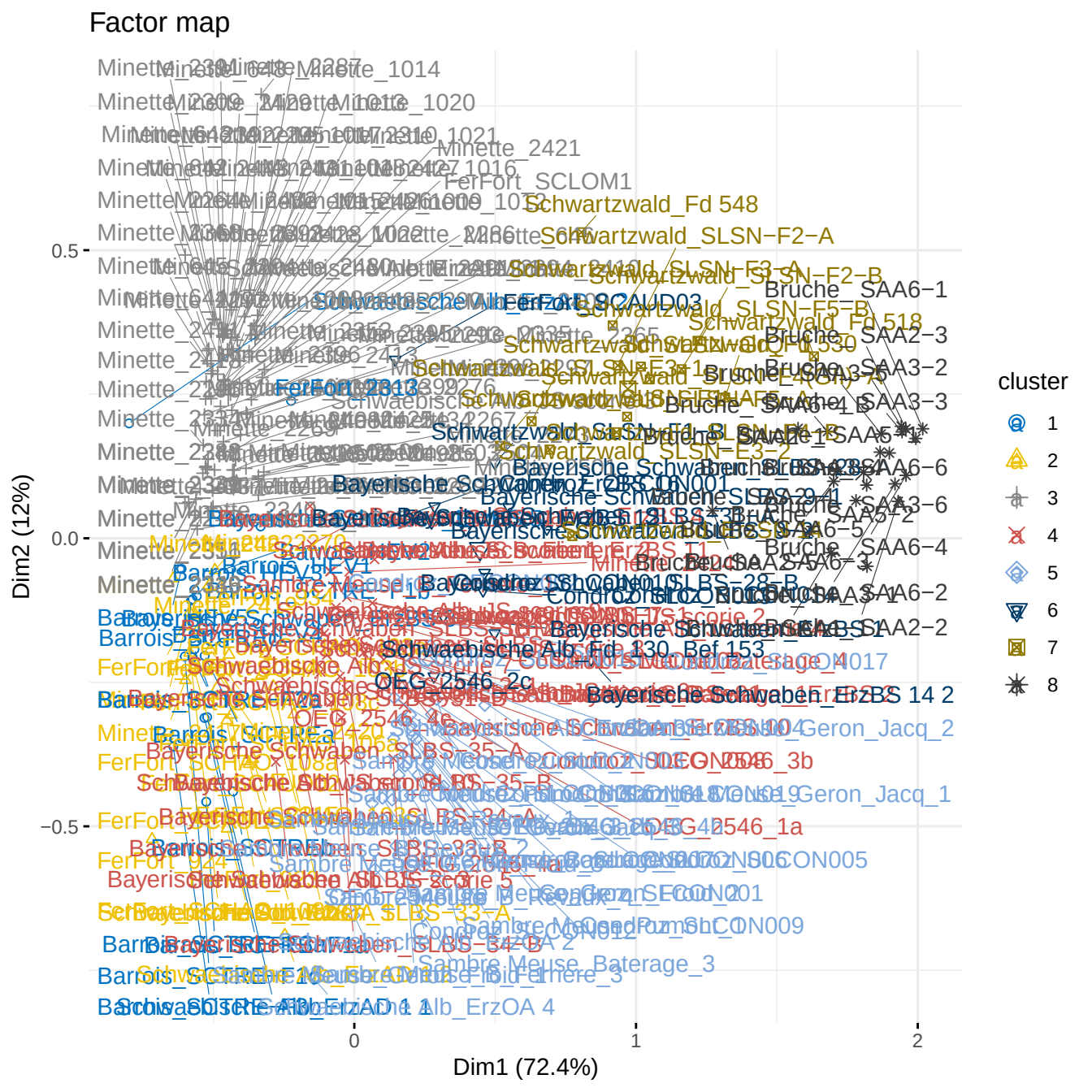

Scree plot
72.4%
12%
10.6%
2.6%
0.8%
0.6%
0.3%
0.3%
0.2%
0.2%
Percentage of explained variances
0
20
40
60
1
2
3
4
5
6
7
8
9
10
Dimensions

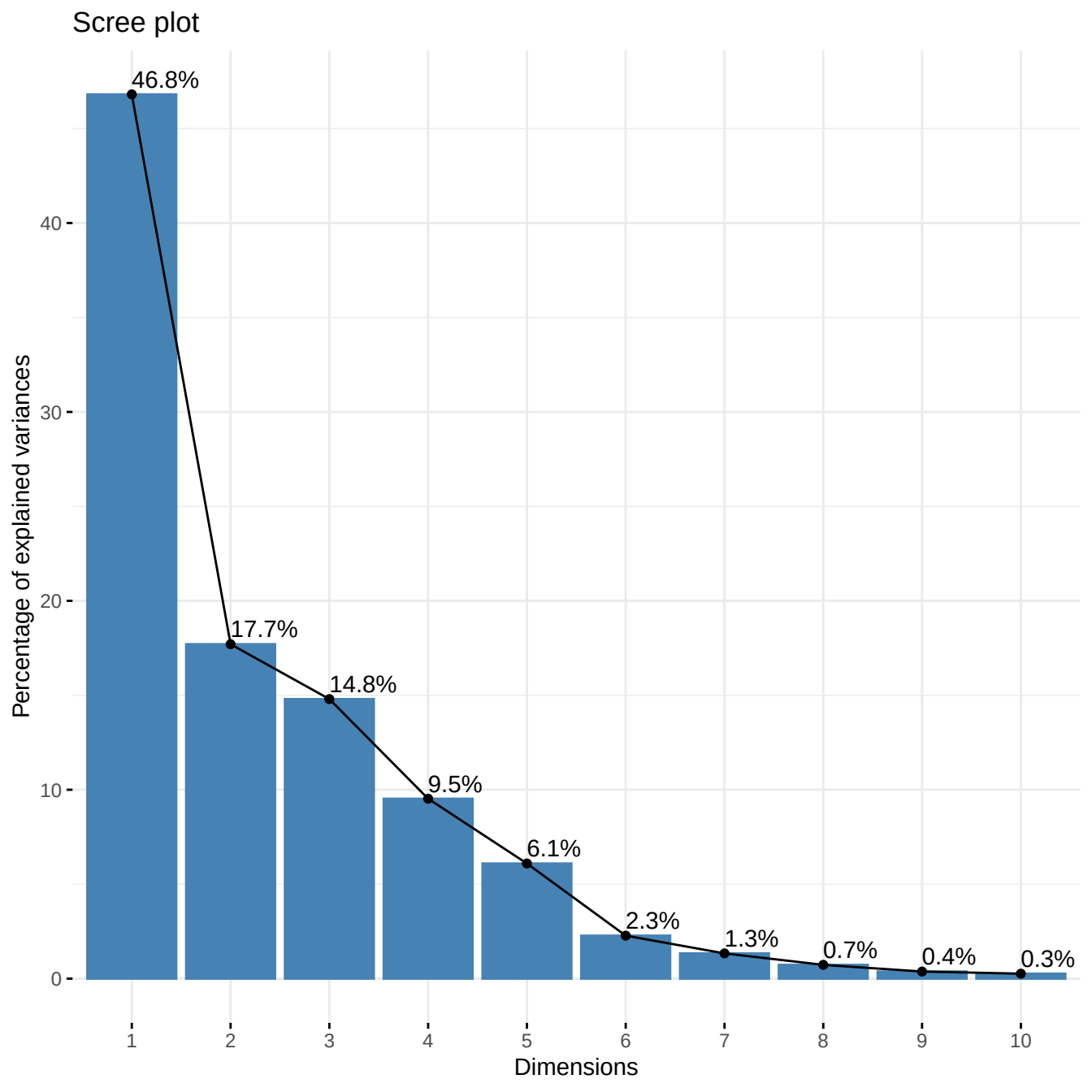

Variables − PCA
Xij_Th
Xij_Yb
Xij_U
Xij_Dy
Xij_Eu
Xij_Gd
Xij_Sm
Xij_Ce
Xij_Y
Xij_Nd
Xij_Pr
Xij_La
contrib
60
40
20
0.2
0.1
0.0
−0.25
0.00
0.25
0.50
Dim2 (12%)
Dim1 (72.4%)

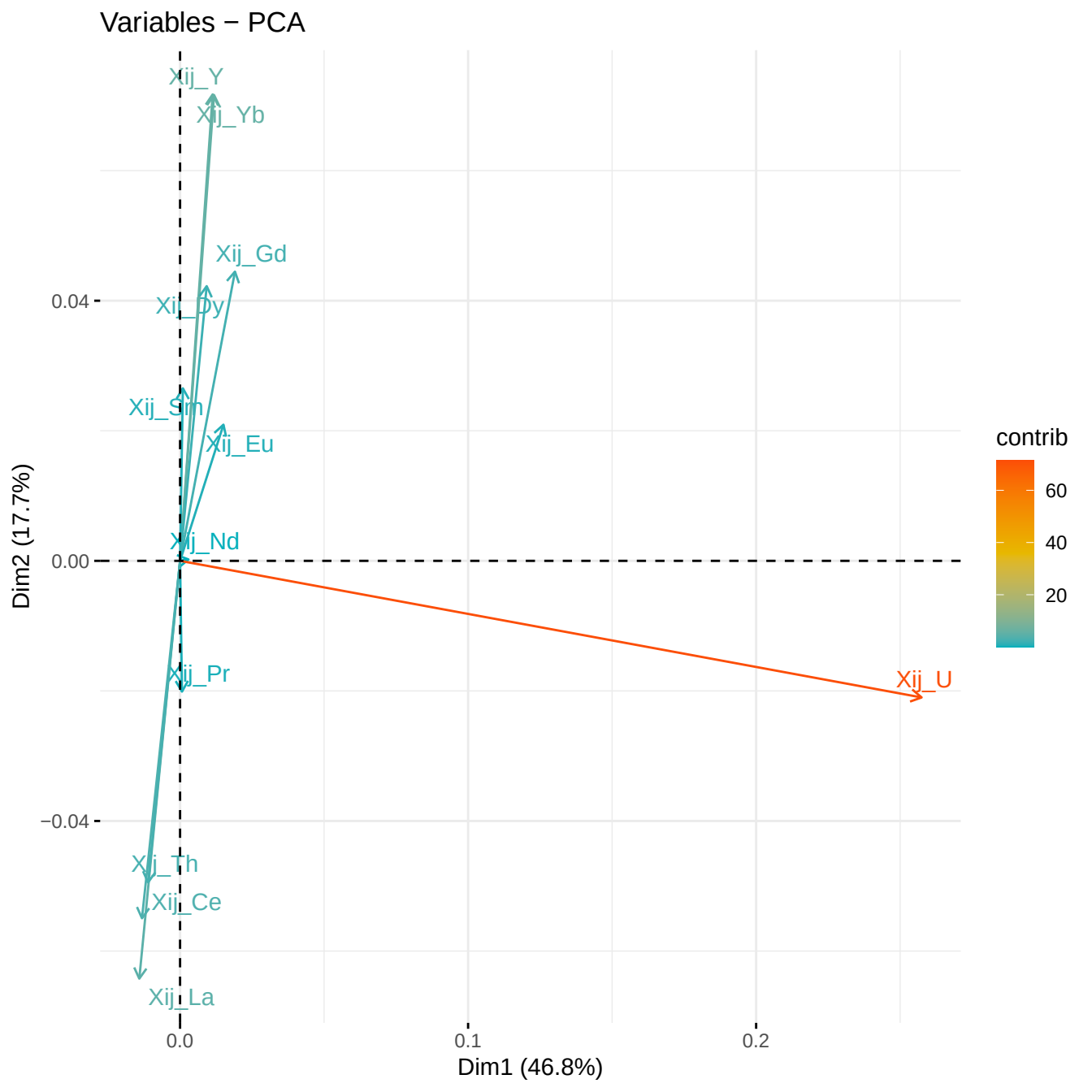

Individuals − PCA
Dim2 (12%)
Dim1 (72.4%)
0.5
0.0
−0.5
0
1
2
Groupes
Furnace slag
nail
Ore
smelting slag
Smelting slag?

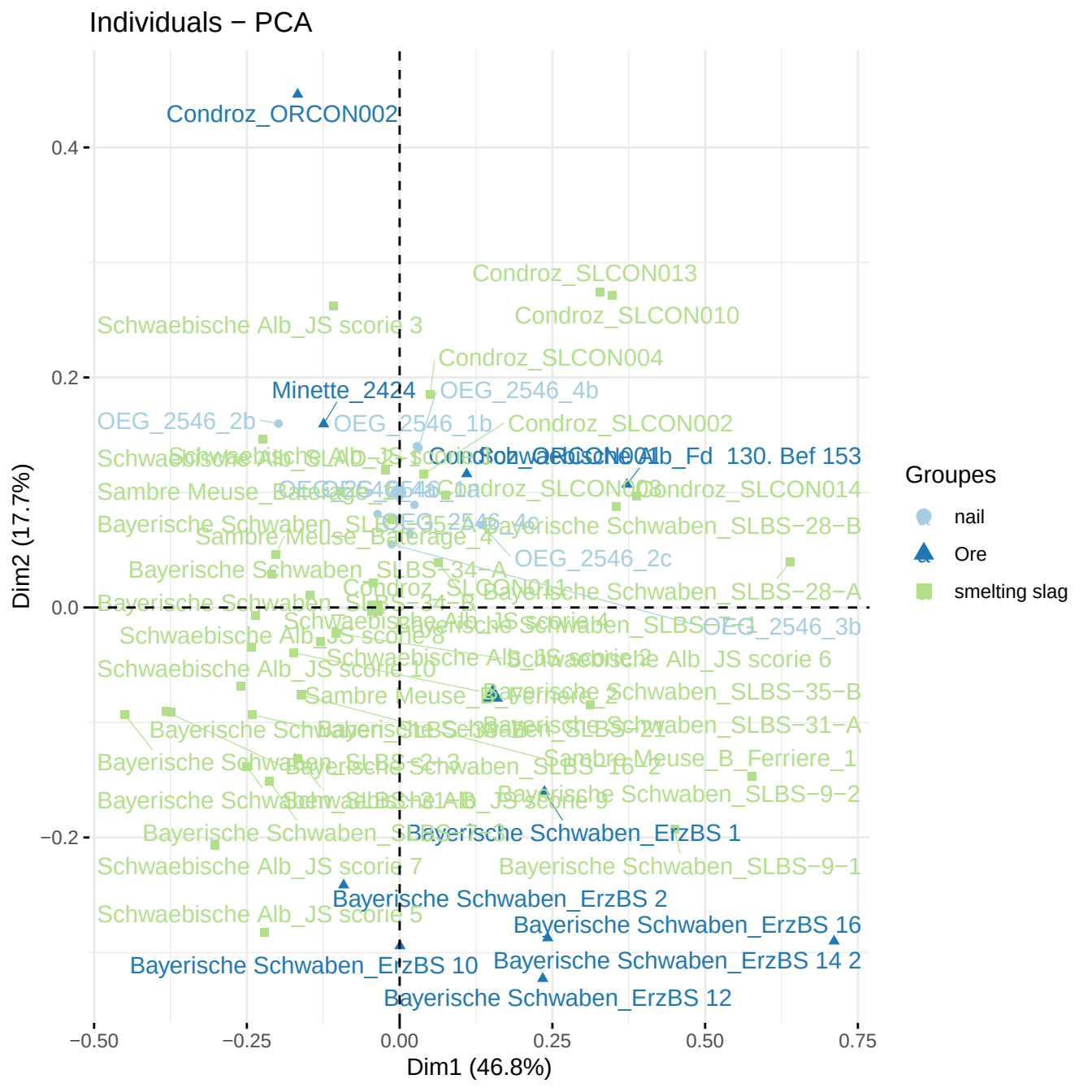

Optimal number of clusters
Gap statistic (k)
0.4
0.6
0.8
1
2
3
4
5
6
7
8
9
10
Number of clusters k

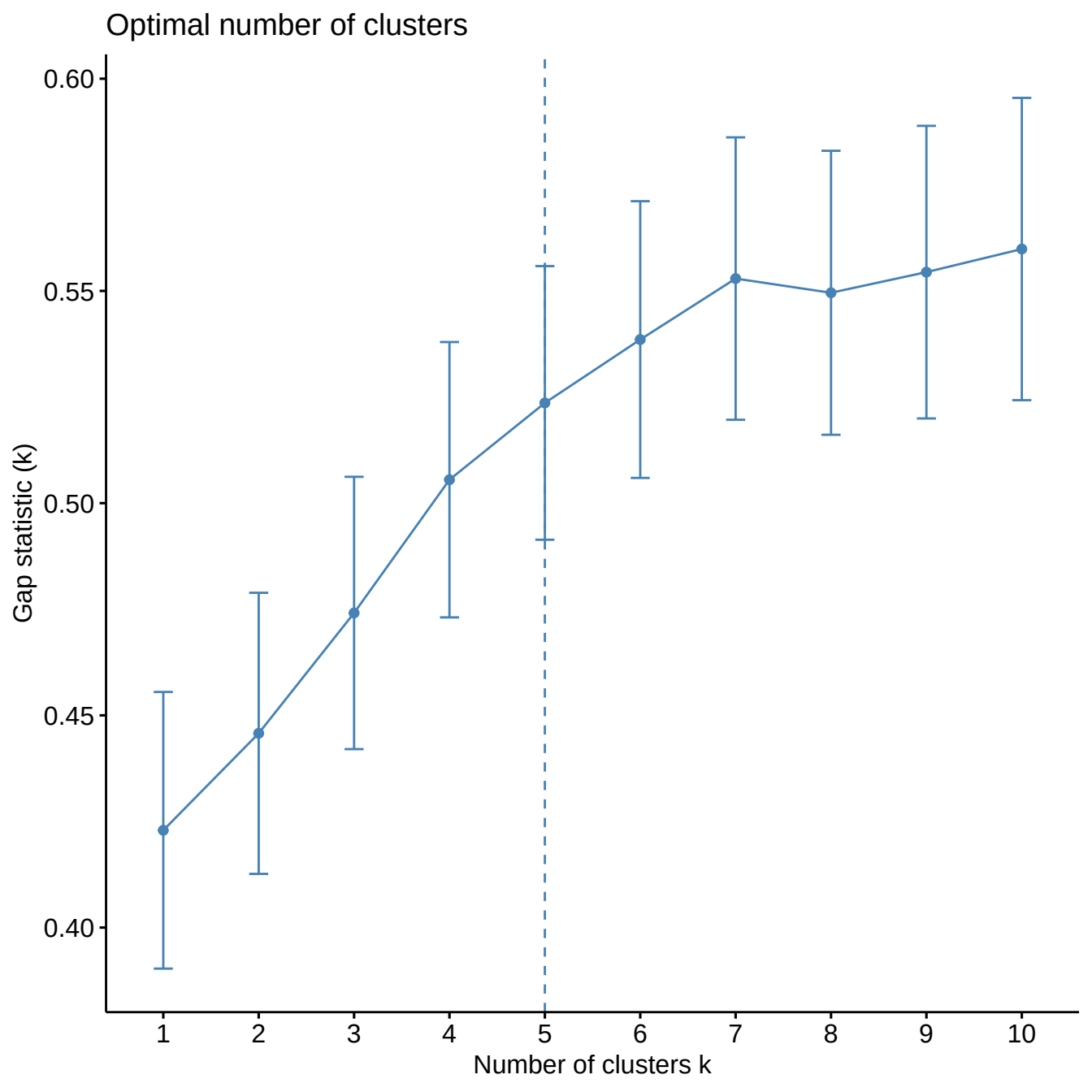

Height
0.3
0.2
0.1
0.0

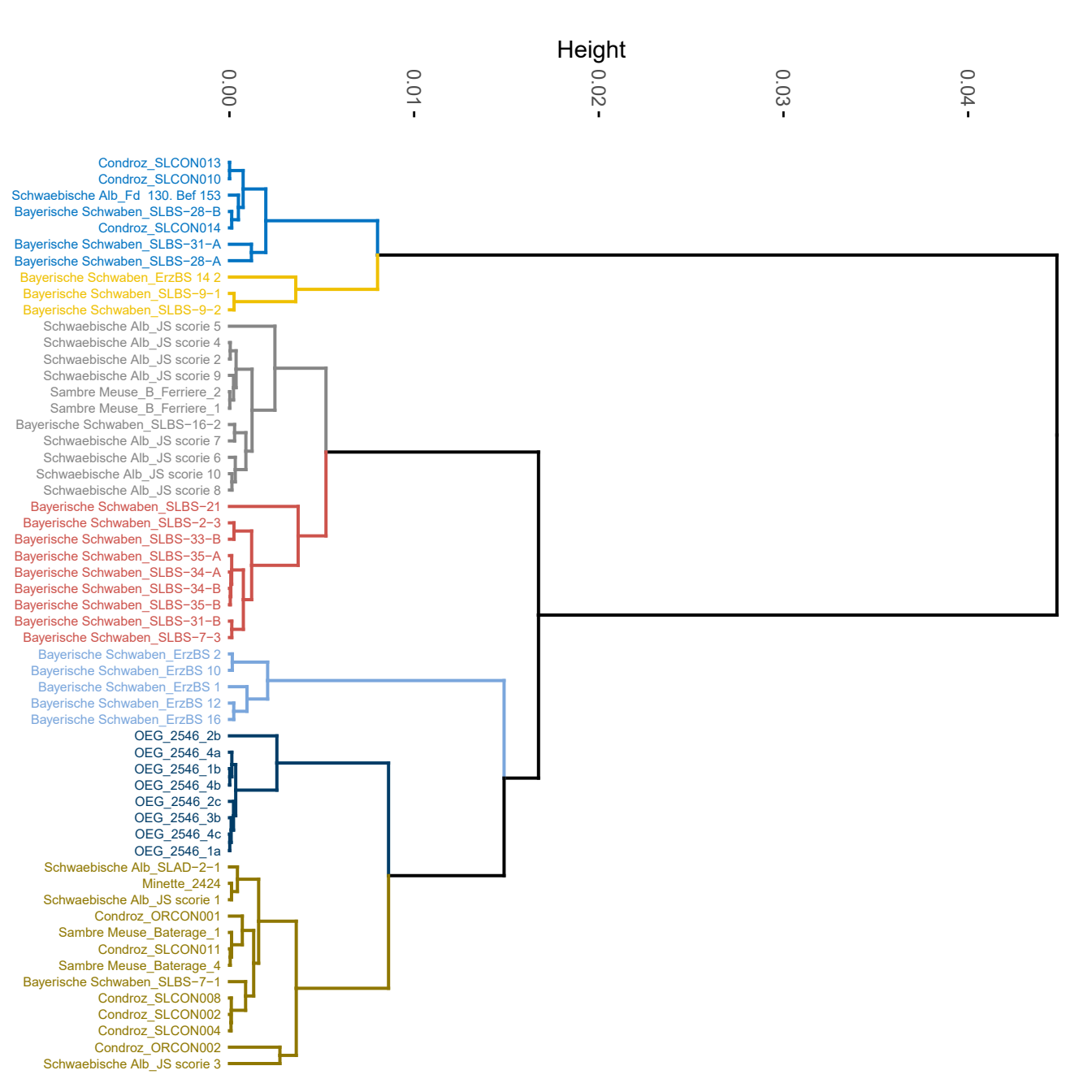

Factor map
Dim2 (12%)
Dim1 (72.4%)
cluster
1
2
3
4
5
6
7
8
0.5
0.0
−0.5
0
1
2

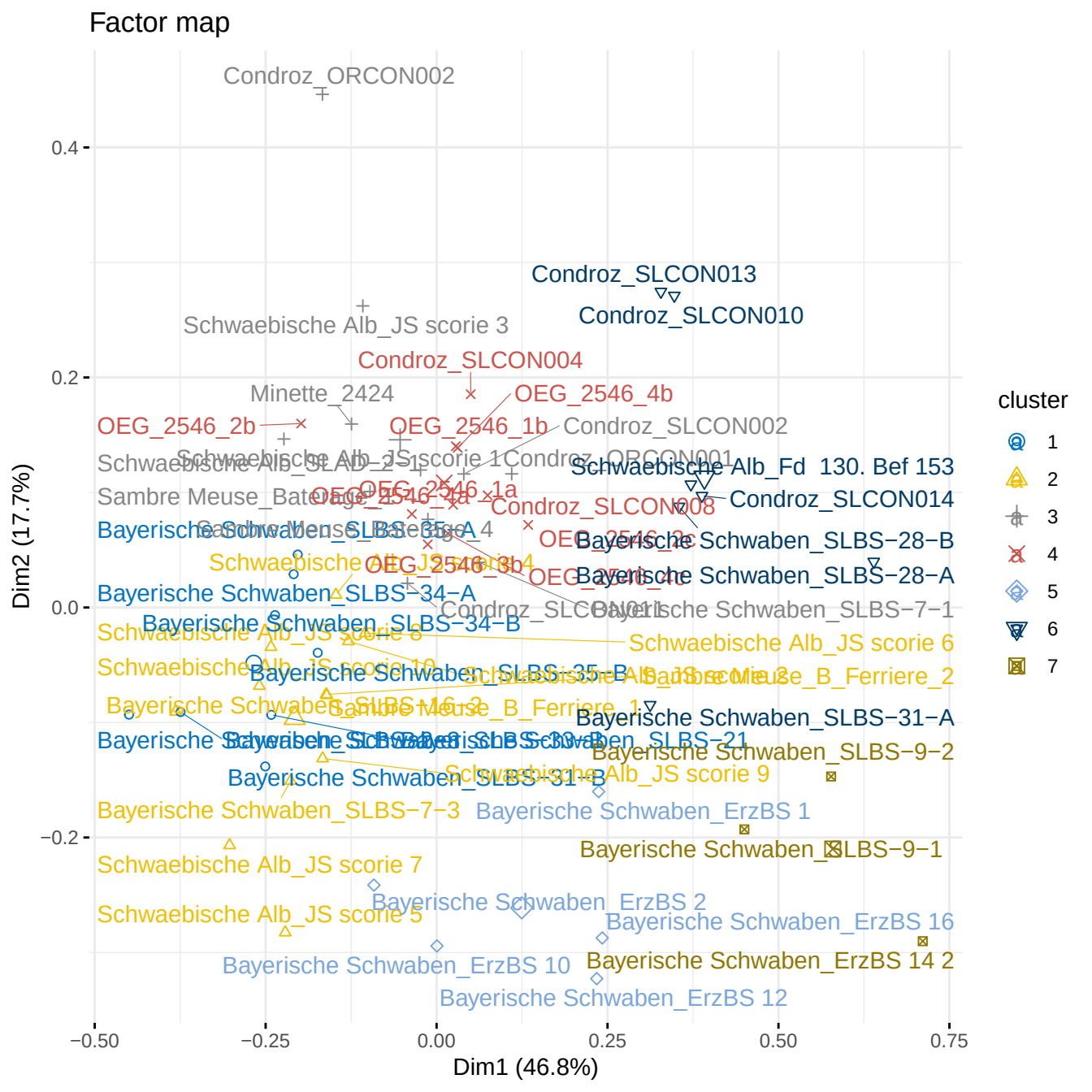

Scree plot
46.8%
17.7%
14.8%
9.5%
6.1%
2.3%
1.3%
0.7%
0.4%
0.3%
Percentage of explained variances
0
10
20
30
40
1
2
3
4
5
6
7
8
9
10
Dimensions


Variables − PCA
Xij_Y
Xij_Yb
Xij_Gd
Xij_Dy
Xij_Sm
Xij_Eu
Xij_Nd
Xij_Pr
Xij_U
Xij_Th
Xij_Ce
Xij_La
0.04
0.00
−0.04
0.0
0.1
0.2
Dim1 (46.8%)
Dim2 (17.7%)
contrib
60
40
20

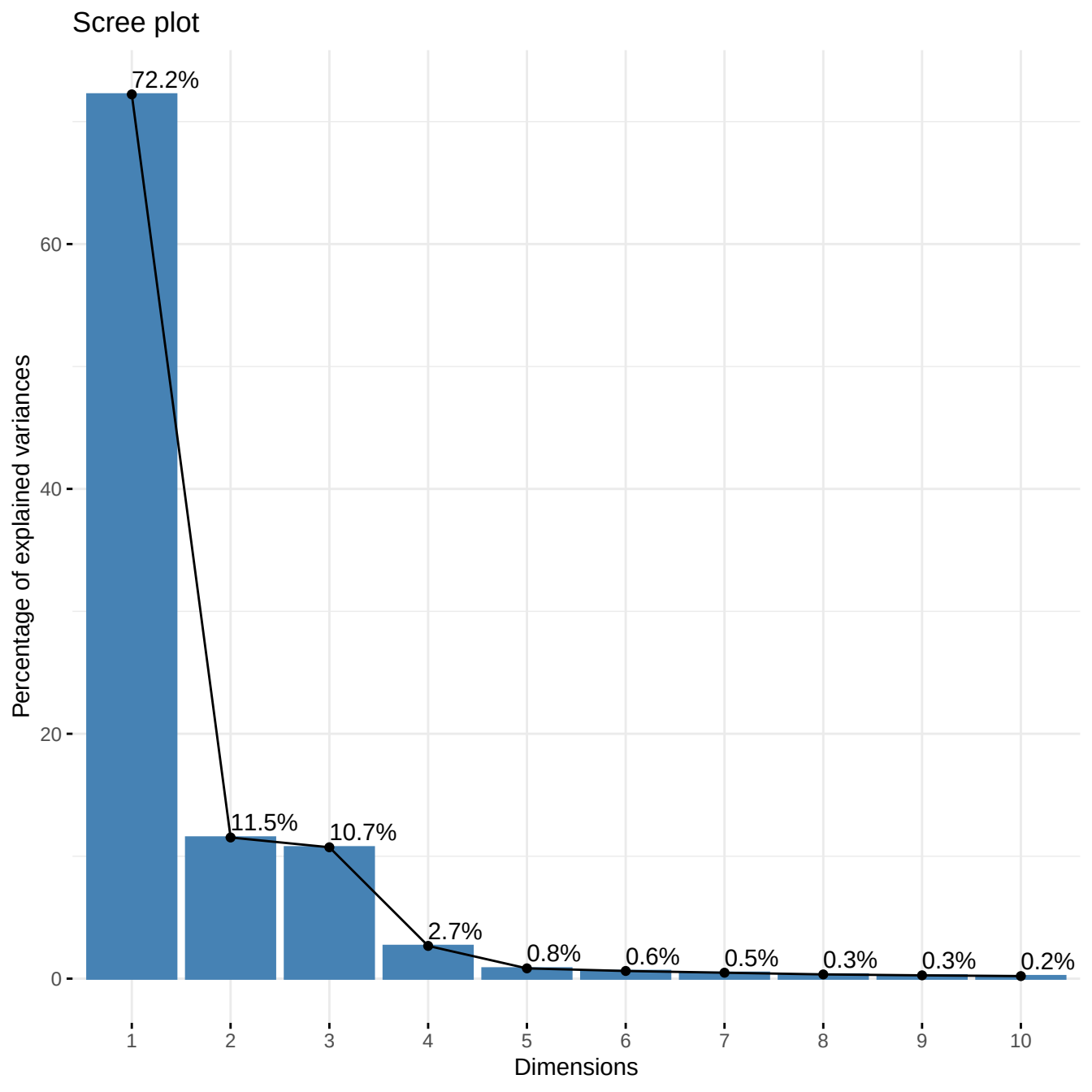

Individuals − PCA
Condroz_ORCON002
Condroz_SLCON013
Condroz_SLCON010
Schwaebische Alb_JS scorie 3
Condroz_SLCON004
Minette_2424
OEG_2546_4b
OEG_2546_2b
OEG_2546_1b
Condroz_SLCON002
Condroz_SLCON001
Bayerische Schwaben_SLBS−28−B
OEG_2546_2c
Bayerische Schwaben_SLBS−28−A
OEG_2546_3b
Schwaebische Alb_JS scorie 6
Schwaebische Alb_JS scorie 10
Bayerische Schwaben_SLBS−35−B
Bayerische Schwaben_SLBS−31−A
Sambre Meuse_B_Ferriere_1
Bayerische Schwaben_SLBS−9−2
Bayerische Schwaben_ErzBS 1
Bayerische Schwaben_SLBS−9−1
Schwaebische Alb_JS scorie 7
Bayerische Schwaben_ErzBS 2
Schwaebische Alb_JS scorie 5
Bayerische Schwaben_ErzBS 16
Bayerische Schwaben_ErzBS 10
Bayerische Schwaben_ErzBS 14 2
Bayerische Schwaben_ErzBS 12
Groupes
nail
Ore
smelting slag
Dim2 (17.7%)
Dim1 (46.8%)
0.4
0.2
0.0
−0.2
−0.50
−0.25
0.00
0.25
0.50
0.75

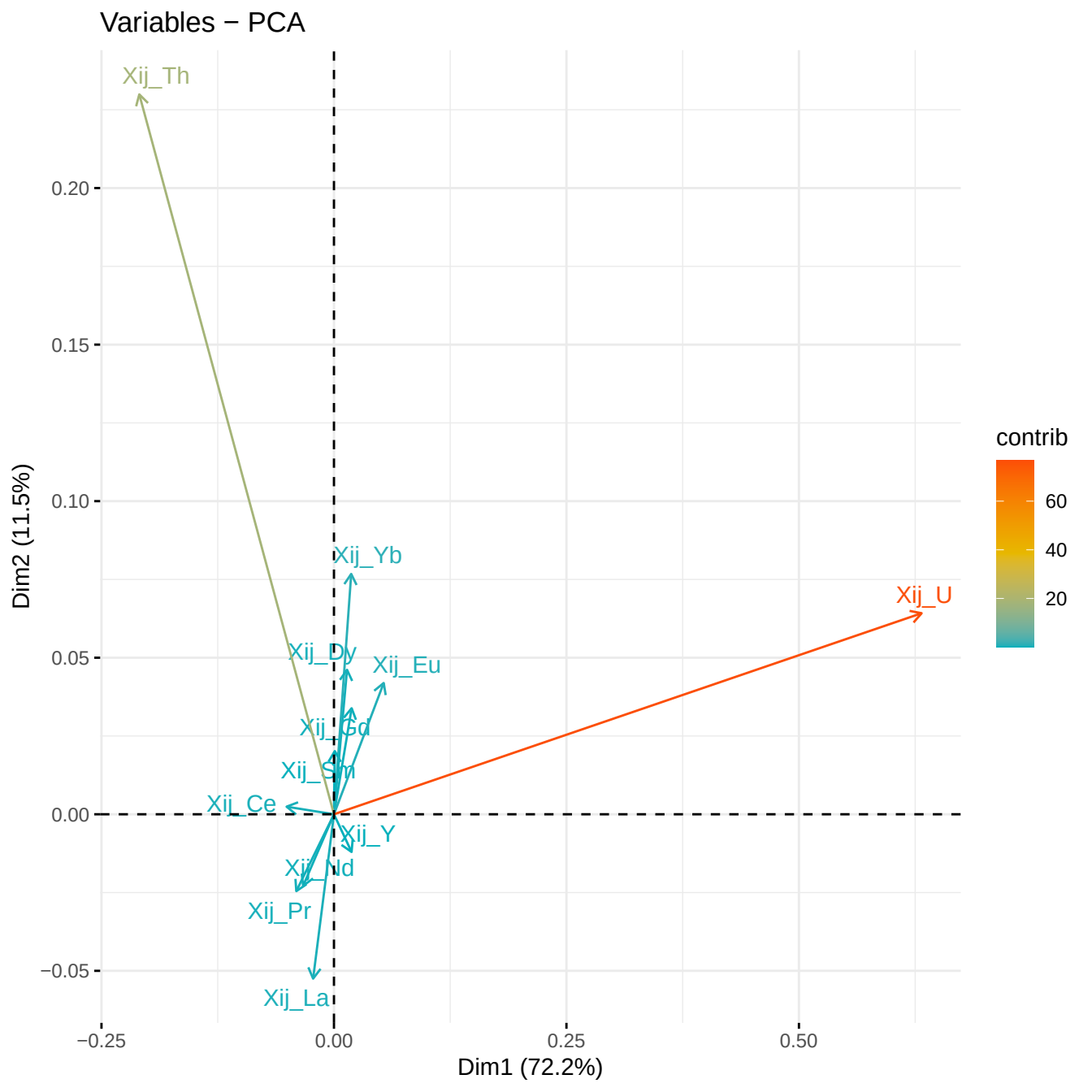

Optimal number of clusters
Gap statistic (k)
0.60
0.55
0.50
0.45
0.40
1
2
3
4
5
6
7
8
9
10
Number of clusters k

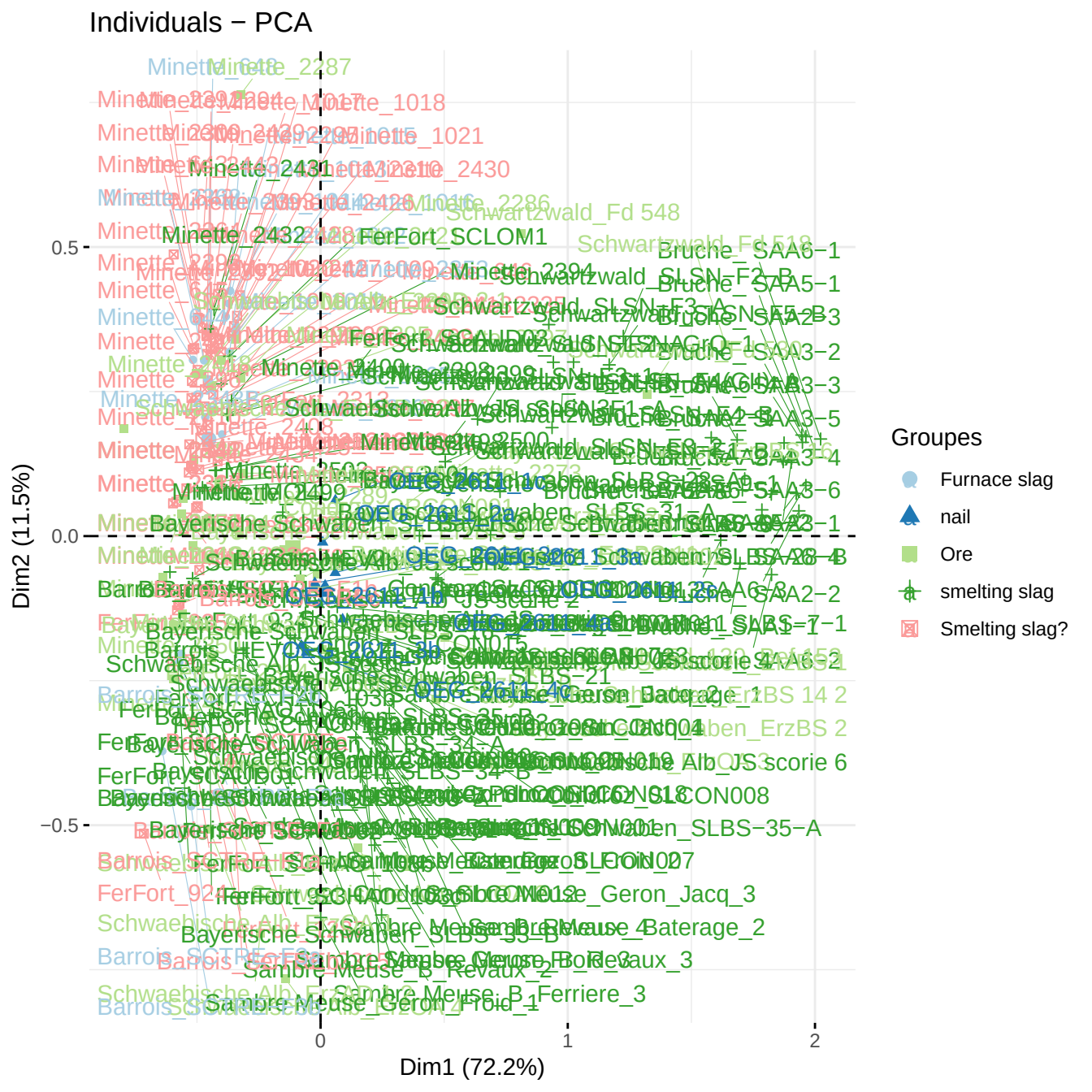

Height
0.00
0.01
0.02
0.03
0.04
Condroz_SLCON013
Condroz_SLCON010
Schwaebische Alb_Fd 130. Bef 153
Bayerische Schwaben_SLBS−28−B
Condroz_SLCON014
Bayerische Schwaben_SLBS−31−A
Bayerische Schwaben_SLBS−28−A
Bayerische Schwaben_ErzBS 14 2
Bayerische Schwaben_SLBS−9−1
Bayerische Schwaben_SLBS−9−2
Schwaebische Alb_JS scorie 5
Schwaebische Alb_JS scorie 4
Schwaebische Alb_JS scorie 2
Schwaebische Alb_JS scorie 9
Sambre Meuse_B_Ferriere_2
Sambre Meuse_B_Ferriere_1
Bayerische Schwaben_SLBS−16−2
Schwaebische Alb_JS scorie 7
Schwaebische Alb_JS scorie 6
Schwaebische Alb_JS scorie 10
Schwaebische Alb_JS scorie 8
Bayerische Schwaben_SLBS−21
Bayerische Schwaben_SLBS−2−3
Bayerische Schwaben_SLBS−33−B
Bayerische Schwaben_SLBS−35−A
Bayerische Schwaben_SLBS−34−A
Bayerische Schwaben_SLBS−34−B
Bayerische Schwaben_SLBS−35−B
Bayerische Schwaben_SLBS−31−B
Bayerische Schwaben_SLBS−7−3
Bayerische Schwaben_ErzBS 2
Bayerische Schwaben_ErzBS 10
Bayerische Schwaben_ErzBS 1
Bayerische Schwaben_ErzBS 12
Bayerische Schwaben_ErzBS 16
OEG_2546_2b
OEG_2546_4a
OEG_2546_1b
OEG_2546_4b
OEG_2546_2c
OEG_2546_3b
OEG_2546_4c
OEG_2546_1a
Schwaebische Alb_SLAD−2−1
Minette_2424
Schwaebische Alb_JS scorie 1
Condroz_ORCON001
Sambre Meuse_Baterage_1
Condroz_SLCON011
Sambre Meuse_Baterage_4
Bayerische Schwaben_SLBS−7−1
Condroz_SLCON008
Condroz_SLCON002
Condroz_SLCON004
Condroz_ORCON002
Schwaebische Alb_JS scorie 3

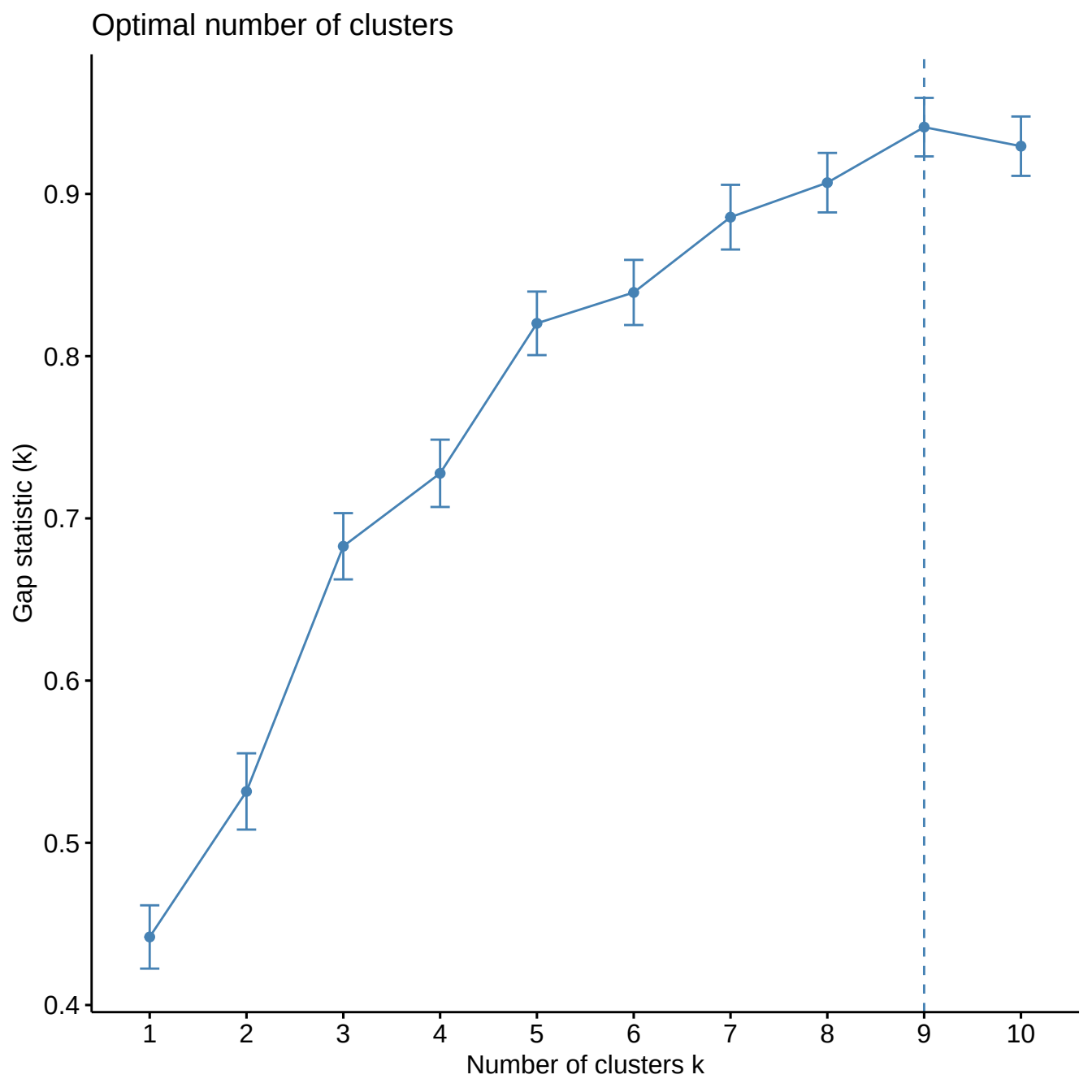

Factor map
Condroz_ORCON002
Condroz_SLCON013
Condroz_SLCON010
Schwaebische Alb_JS scorie 3
Condroz_SLCON004
Minette_2424
OEG_2546_4b
OEG_2546_2b
OEG_2546_1b
Condroz_SLCON002
Schwaebische Alb_JS scorie 1
Condroz_ORCON001
Schwaebische Alb_SLAD_2
Schwaebische Alb_Fd 130. Bef 153
Sambre Meuse_Batenage_2546_1a
Condroz_SLCON014
Condroz_SLCON008
Bayerische Schwaben_SLBS_35_A
OEG_2546_3a
Bayerische Schwaben_SLBS−28−B
Schwaebische Alb_JS scorie 4
OEG_2546_3b
Bayerische Schwaben_SLBS−28−A
Bayerische Schwaben_SLBS−34−A
Condroz_SLCON011
Bayerische Schwaben_SLBS−7−1
Bayerische Schwaben_SLBS−34−B
Schwaebische Alb_JS scorie 6
Schwaebische Alb_JS scorie 8
Schwaebische Alb_JS scorie 10
Bayerische Schwaben_SLBS−35−B
Sambre Meuse_B_Ferriere_2
Bayerische Schwaben_SLBS−16−2
Sambre Meuse_B_Ferriere_1
Bayerische Schwaben_SLBS−31−A
Bayerische Schwaben_SLBS−21
Bayerische Schwaben_SLBS−9−2
Schwaebische Alb_JS scorie 9
Bayerische Schwaben_SLBS−31−B
Bayerische Schwaben_SLBS−7−3
Bayerische Schwaben_ErzBS 1
Bayerische Schwaben_SLBS−9−1
Schwaebische Alb_JS scorie 7
Bayerische Schwaben_ErzBS 2
Schwaebische Alb_JS scorie 5
Bayerische Schwaben_ErzBS 16
Bayerische Schwaben_ErzBS 10
Bayerische Schwaben_ErzBS 14 2
Bayerische Schwaben_ErzBS 12
0.4
0.2
0.0
−0.2
−0.50
−0.25
0.00
0.25
0.50
0.75
Dim2 (17.7%)
Dim1 (46.8%)
cluster
1
2
3
4
5
6
7

OEG 2611

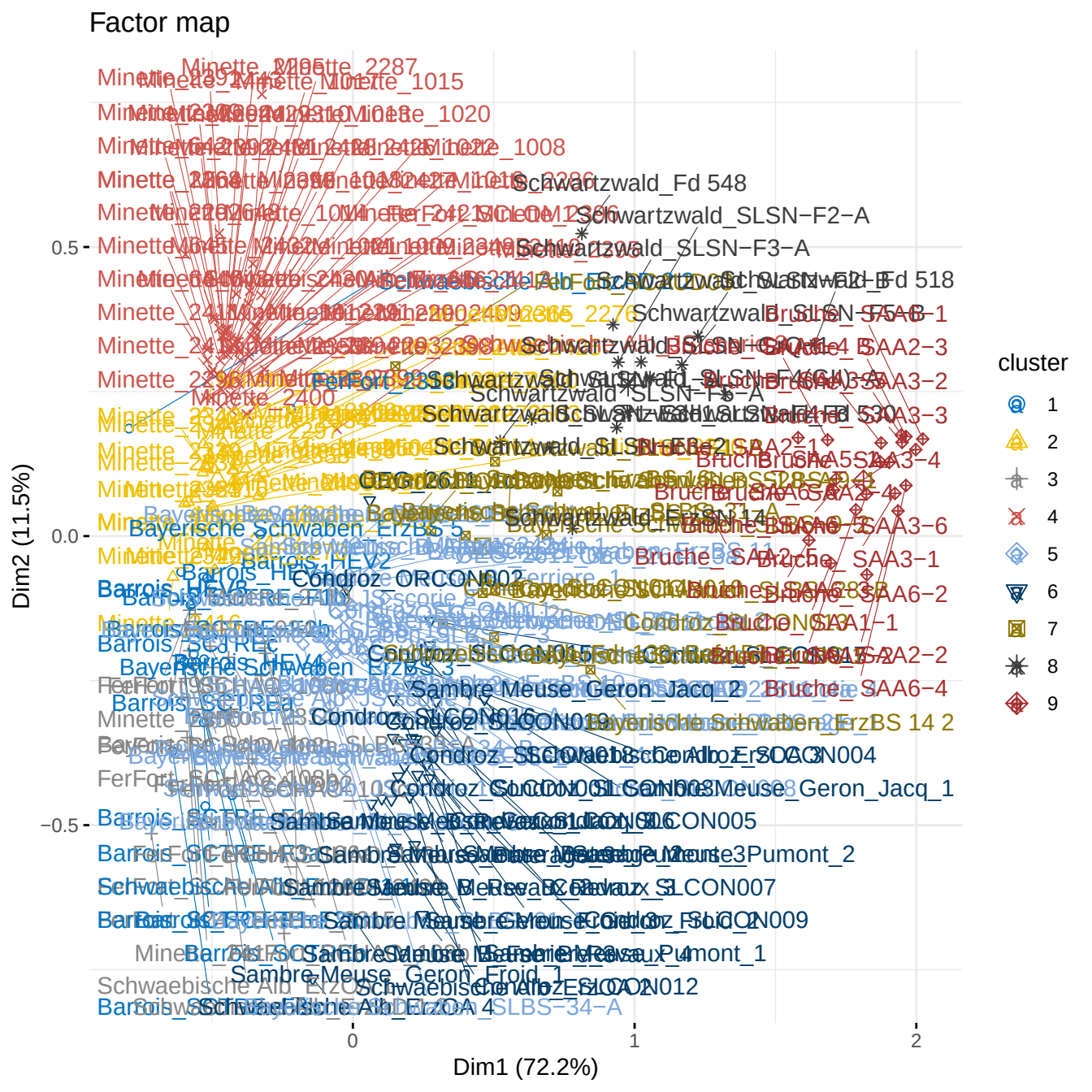

Scree plot
72.2%
11.5%
10.7%
2.7%
0.8%
0.6%
0.5%
0.3%
0.3%
0.2%
Percentage of explained variances
0
20
40
60
1
2
3
4
5
6
7
8
9
10
Dimensions

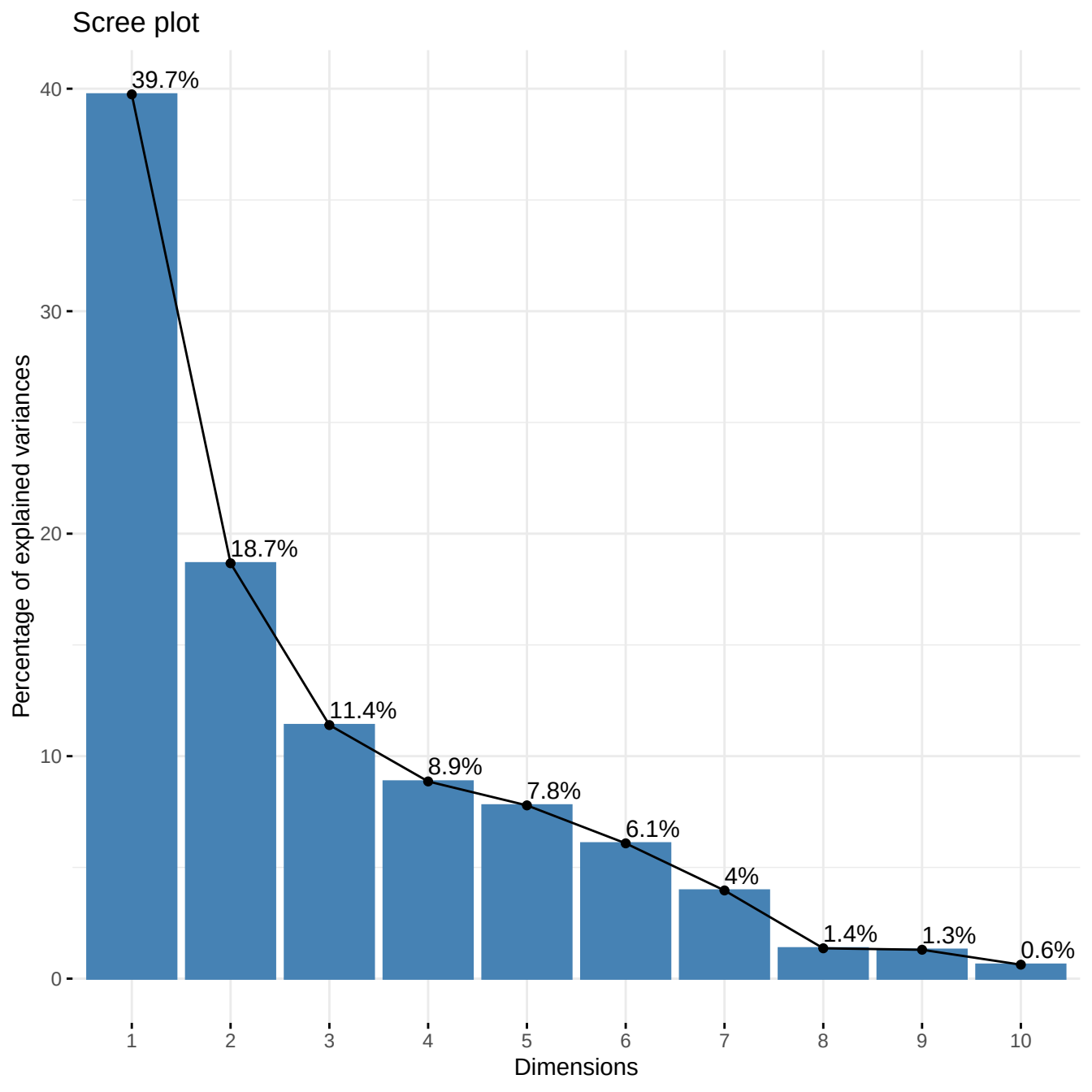

Variables − PCA
Xij_Th
Xij_U
Xij_Yb
Xij_Dy
Xij_Eu
Xij_Gd
Xij_Sm
Xij_Ce
Xij_Y
Xij_Nd
Xij_Pr
Xij_La
contrib
60
40
20
0.20
0.15
0.10
0.05
0.00
−0.05
−0.25
0.00
0.25
0.50
Dim2 (11.5%)
Dim1 (72.2%)

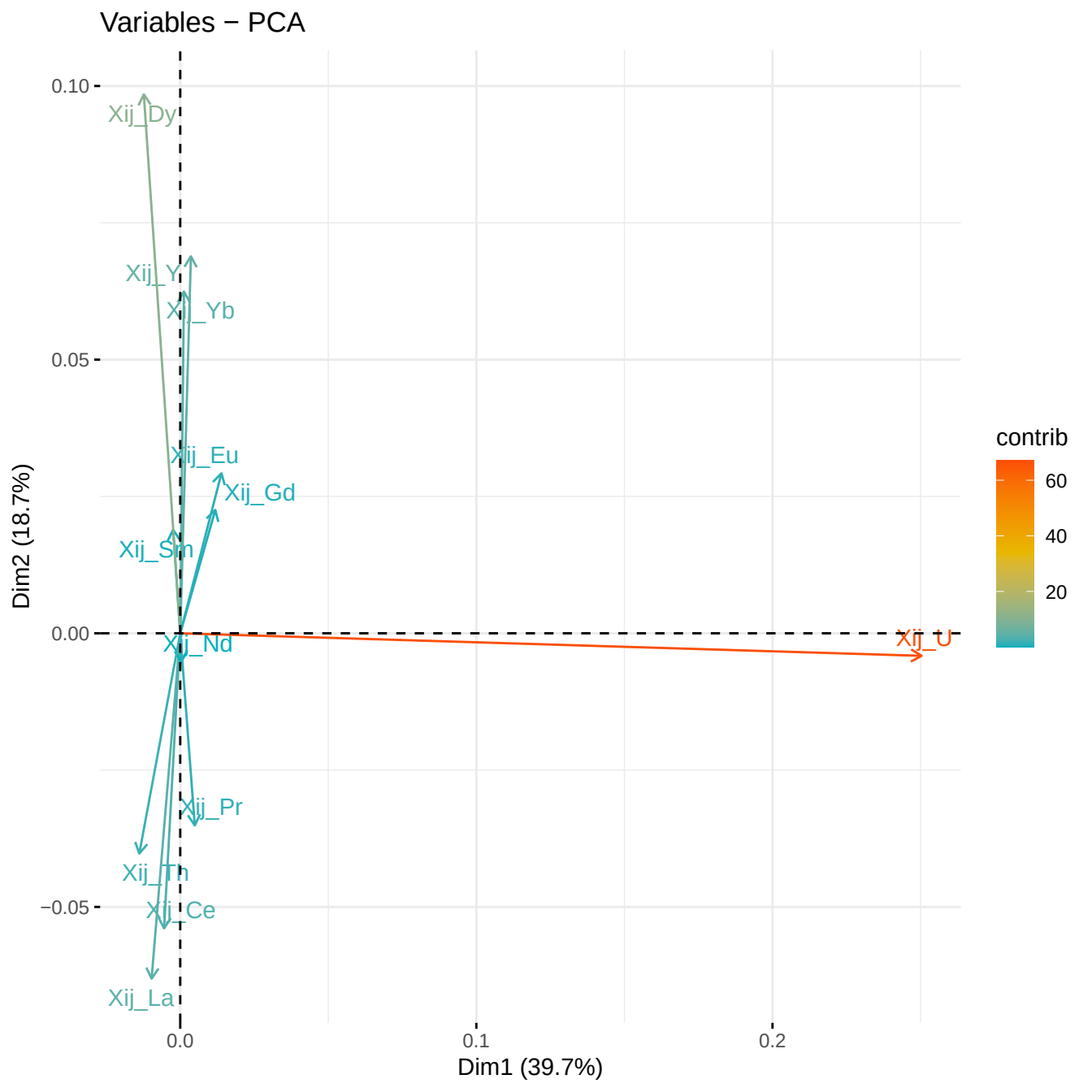

Individuals − PCA
Dim2 (11.5%)
Dim1 (72.2%)
0.5
0.0
−0.5
0
1
2
Groupes
Furnace slag
nail
Ore
smelting slag
Smelting slag?

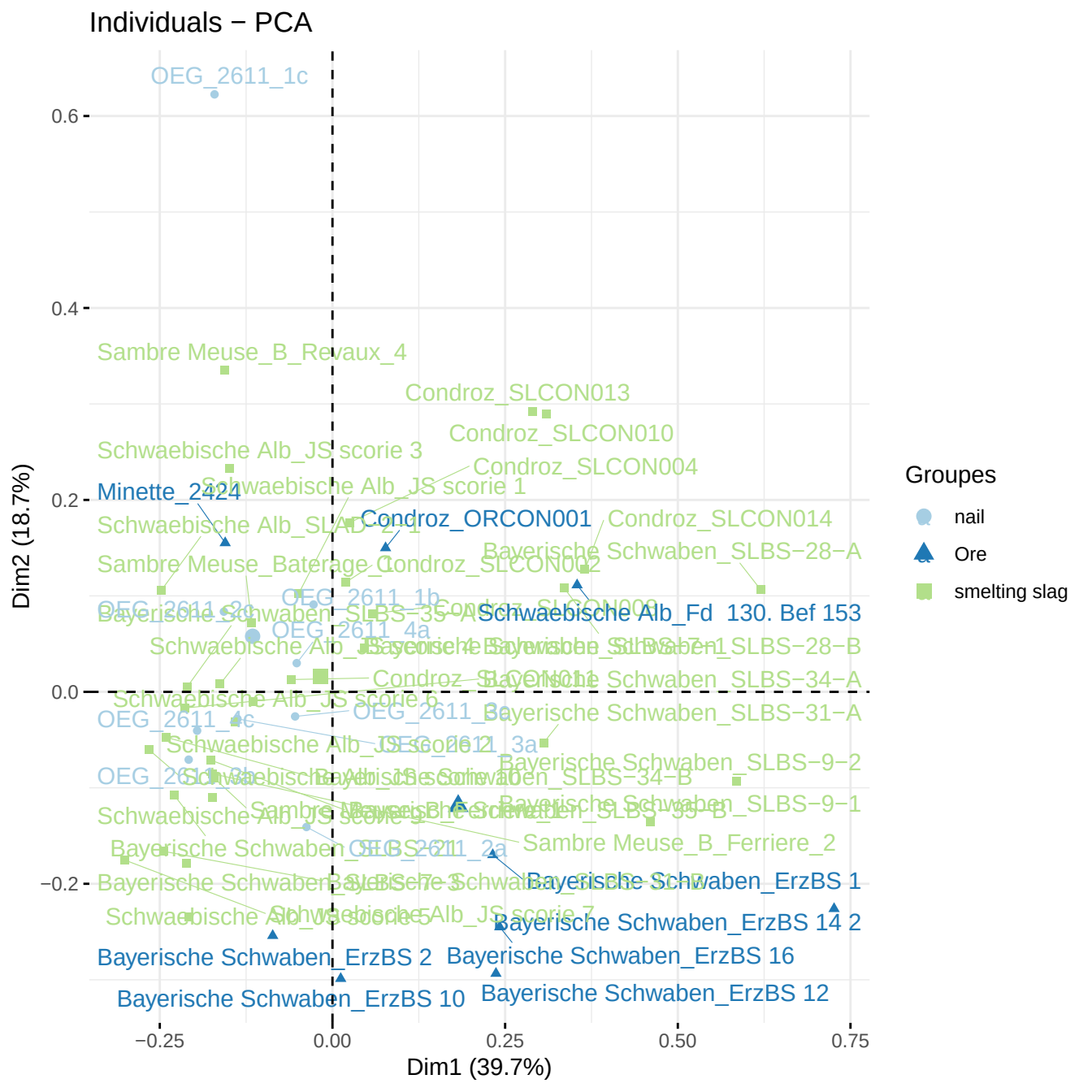

Optimal number of clusters
Gap statistic (k)
0.4
0.5
0.6
0.7
0.8
0.9
1
2
3
4
5
6
7
8
9
10
Number of clusters k

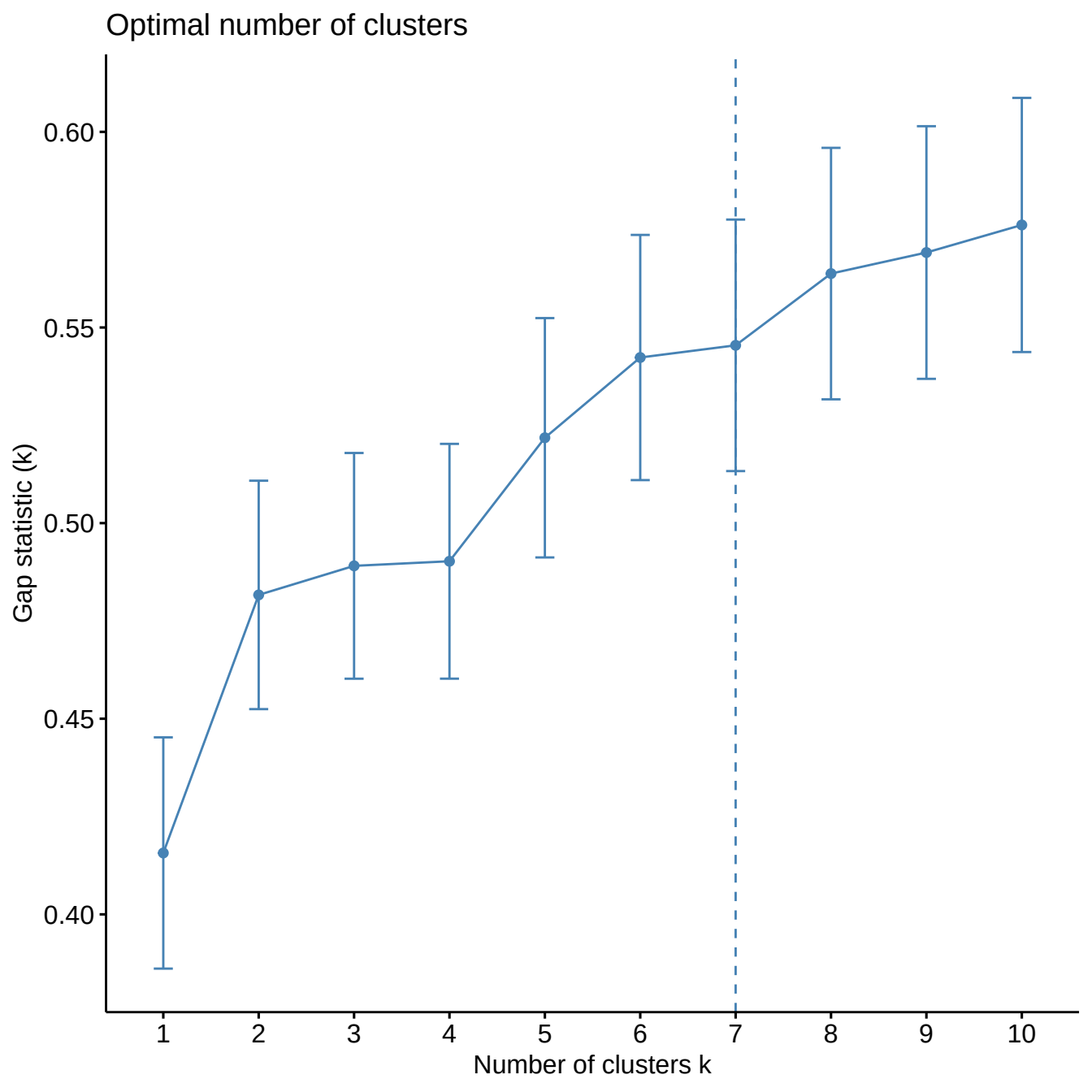

Height
0.3
0.2
0.1
0.0

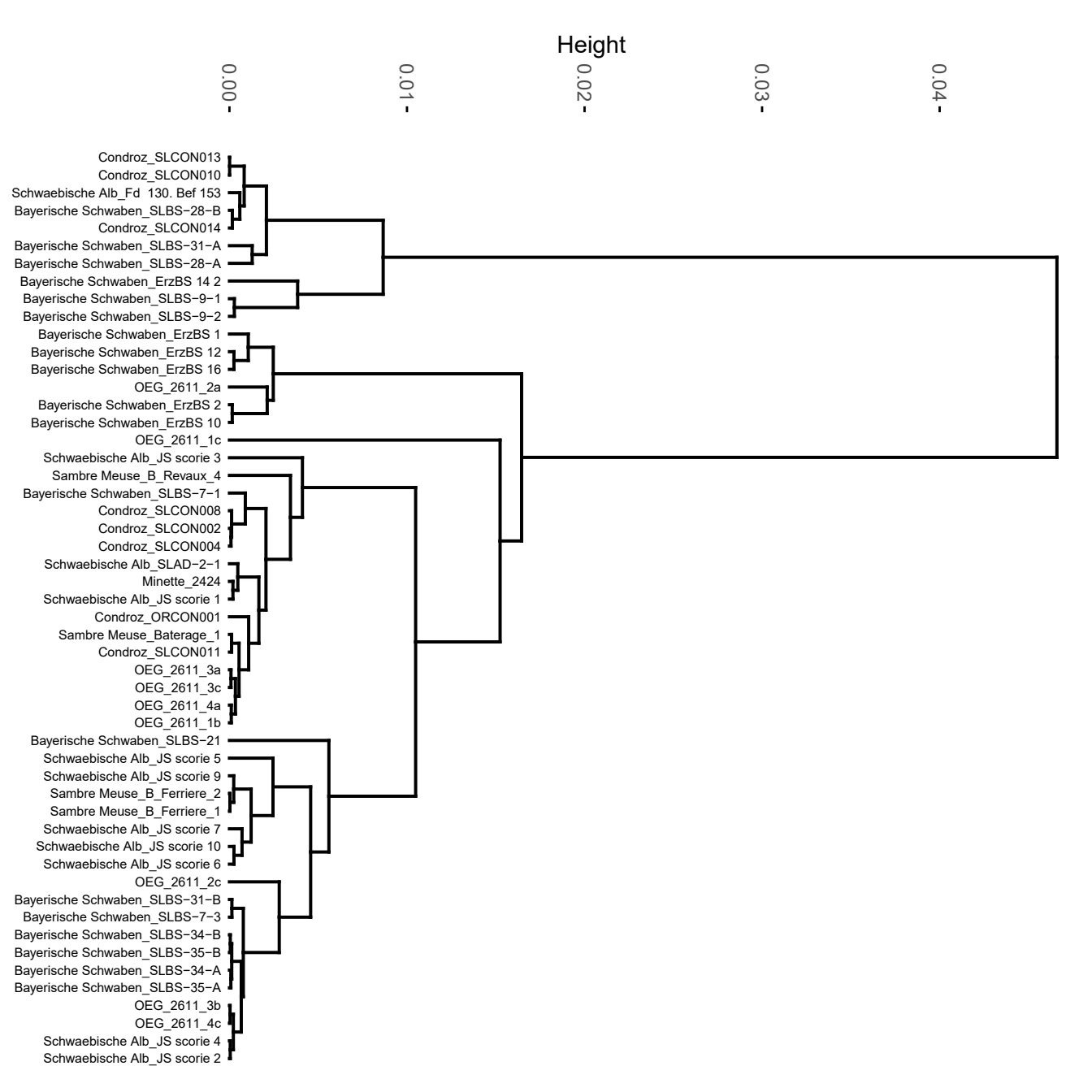

Factor map
Schwartzwald_Fd 548
Schwartzwald_SLSN−F2−A
Schwartzwald_SLSN−F3−A
Schwartzwald_Fd 518
Schwartzwald_SLSN−F5−B
Schwartzwald_SLSN−F4−A
Schwartzwald_SLSN−F1−A
Schwartzwald_SLSN−F4−B
Schwartzwald_SLSN−F3−B
Bayerische Schwaben_ErzBS 5
Barrois_HEV2
Condroz_ORCON002
Sambre Meuse_Geron_Jacq_2
Condroz_SLCON016
Bayerische Schwaben_ErzBS 14 2
Condroz_SLCON018
Condroz_SLCON004
Sambre Meuse_Geron_Jacq_1
Condroz_SLCON005
Sambre Meuse_Pumont_2
Condroz_SLCON007
Sambre Meuse_Geron_Froid_2
Condroz_SLCON009
Sambre Meuse_Pumont_1
Schwaebische Alb_ErzOA 4
Condroz_SLCON012
Bruche_SAA3−1
Bruche_SAA6−2
Bruche_SAA1−1
Bruche_SAA2−2
Bruche_SAA6−4
Bruche_SAA3−6
Bruche_SAA2−5
Bruche_SAA3−4
Bruche_SAA2−4
Bruche_SAA3−3
Bruche_SAA3−2
Bruche_SAA2−3
Bruche_SAA6−1
Bruche_SAA2−1
cluster
1
2
3
4
5
6
7
8
9
Dim1 (72.2%)
Dim2 (11.5%)
0
1
2
0.5
0.0
−0.5

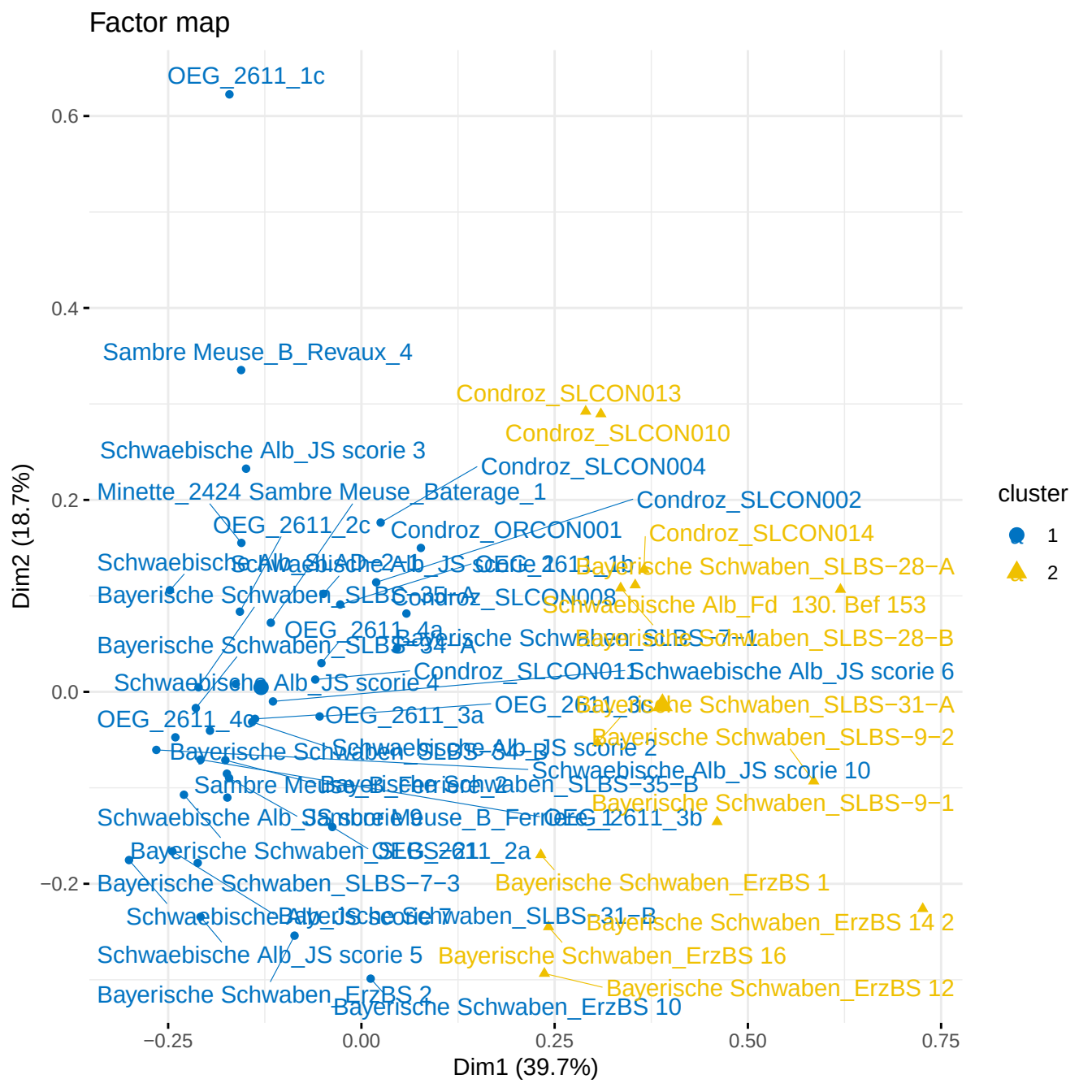

Scree plot
39.7%
18.7%
11.4%
8.9%
7.8%
6.1%
4%
1.4%
1.3%
0.6%
40
30
20
10
0
Percentage of explained variances
1
2
3
4
5
6
7
8
9
10
Dimensions


Variables − PCA
Xij_Dy
Xij_Y
Xij_Yb
Xij_Eu
Xij_Gd
Xij_Sm
Xij_Nd
Xij_U
Xij_Pr
Xij_Th
Xij_Ce
Xij_La
0.10
0.05
0.00
−0.05
0.0
0.1
0.2
Dim2 (18.7%)
Dim1 (39.7%)
contrib
60
40
20

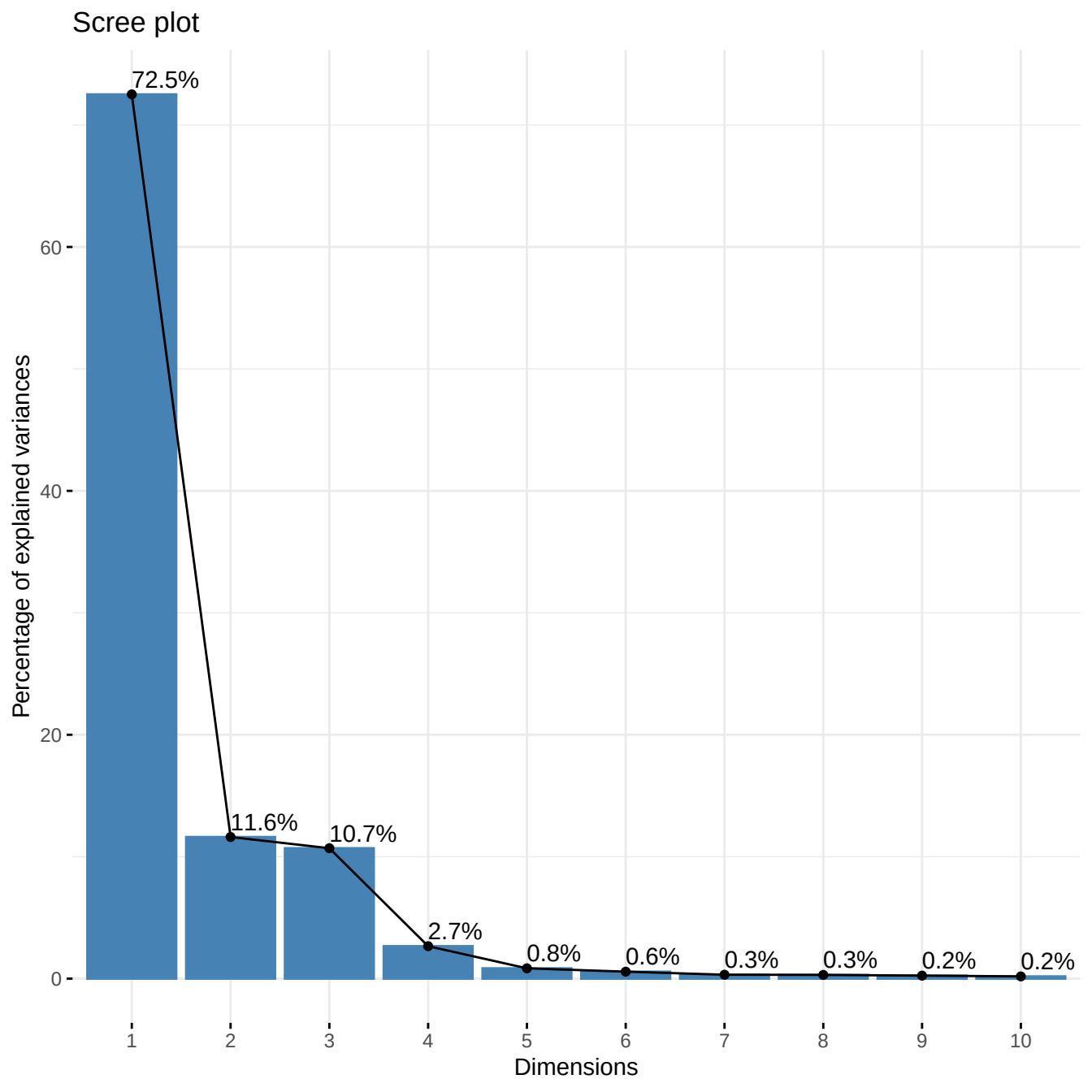

Individuals − PCA
OEG_2611_1c
Sambre Meuse_B_Revaux_4
Condroz_SLCON013
Condroz_SLCON010
Schwaebische Alb_JS scorie 3
Condroz_SLCON004
Schwaebische Alb_JS scorie 1
Minette_2424
Condroz_ORCON001
Condroz_SLCON014
Schwaebische Alb_SLAD_2_1
Bayerische Schwaben_SLBS−28−A
Sambre Meuse_Baterage_1
Condroz_SLCON002
OEG_2611_1b
Schwaebische Alb_Fd 130. Bef 153
OEG_2611_4a
Schwaebische Alb_JS scorie 6
Bayerische Schwaben_SLBS−28−B
Condroz_SLCON011
Bayerische Schwaben_SLBS−34−A
Schwaebische Alb_JS scorie 6
OEG_2611_4c
OEG_2611_3a
Bayerische Schwaben_SLBS−31−A
Schwaebische Alb_JS scorie 2
Bayerische Schwaben_SLBS−9−2
Bayerische Schwaben_SLBS−34−B
Bayerische Schwaben_SLBS−9−1
Sambre Meuse_B_Ferriere_2
OEG_2611_2a
Bayerische Schwaben_ErzBS 1
Bayerische Schwaben_ErzBS 14 2
Schwaebische Alb_JS scorie 7
Bayerische Schwaben_ErzBS 2
Bayerische Schwaben_ErzBS 16
Bayerische Schwaben_ErzBS 10
Bayerische Schwaben_ErzBS 12
0.6
0.4
0.2
0.0
−0.2
−0.25
0.00
0.25
0.50
0.75
Dim2 (18.7%)
Dim1 (39.7%)
Groupes
nail
Ore
smelting slag

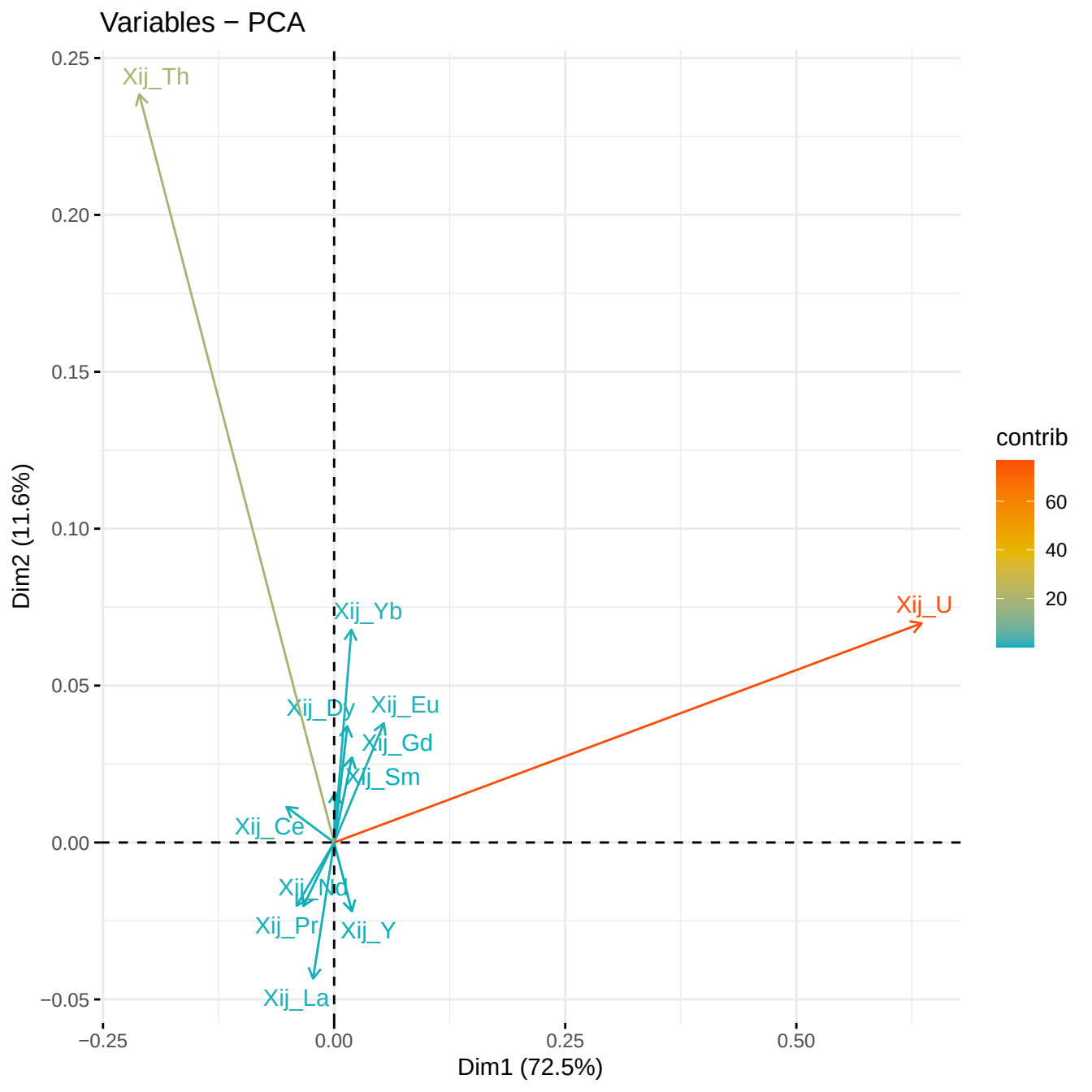

Optimal number of clusters
Gap statistic (k)
0.60
0.55
0.50
0.45
0.40
1
2
3
4
5
6
7
8
9
10
Number of clusters k

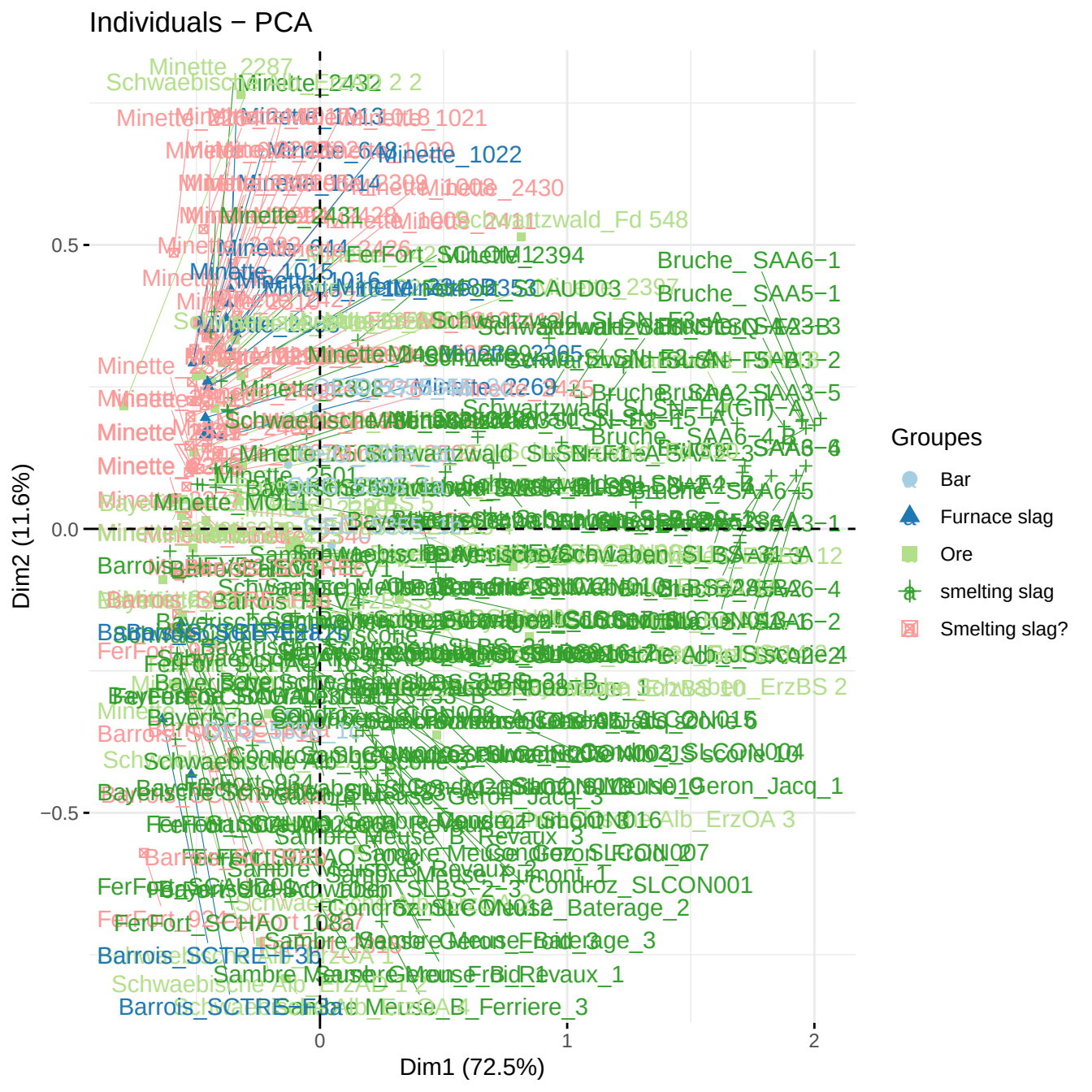

Height
0.00
0.01
0.02
0.03
0.04
Condroz_SLCON013
Condroz_SLCON010
Schwaebische Alb_Fd 130. Bef 153
Bayerische Schwaben_SLBS−28−B
Condroz_SLCON014
Bayerische Schwaben_SLBS−31−A
Bayerische Schwaben_SLBS−28−A
Bayerische Schwaben_ErzBS 14 2
Bayerische Schwaben_SLBS−9−1
Bayerische Schwaben_SLBS−9−2
Bayerische Schwaben_ErzBS 1
Bayerische Schwaben_ErzBS 12
Bayerische Schwaben_ErzBS 16
OEG_2611_2a
Bayerische Schwaben_ErzBS 2
Bayerische Schwaben_ErzBS 10
OEG_2611_1c
Schwaebische Alb_JS scorie 3
Sambre Meuse_B_Revaux_4
Bayerische Schwaben_SLBS−7−1
Condroz_SLCON008
Condroz_SLCON002
Condroz_SLCON004
Schwaebische Alb_SLAD−2−1
Minette_2424
Schwaebische Alb_JS scorie 1
Condroz_ORCON001
Sambre Meuse_Baterage_1
Condroz_SLCON011
OEG_2611_3a
OEG_2611_3c
OEG_2611_4a
OEG_2611_1b
Bayerische Schwaben_SLBS−21
Schwaebische Alb_JS scorie 5
Schwaebische Alb_JS scorie 9
Sambre Meuse_B_Ferriere_2
Sambre Meuse_B_Ferriere_1
Schwaebische Alb_JS scorie 7
Schwaebische Alb_JS scorie 10
Schwaebische Alb_JS scorie 6
OEG_2611_2c
Bayerische Schwaben_SLBS−31−B
Bayerische Schwaben_SLBS−7−3
Bayerische Schwaben_SLBS−34−B
Bayerische Schwaben_SLBS−35−B
Bayerische Schwaben_SLBS−34−A
Bayerische Schwaben_SLBS−35−A
OEG_2611_3b
OEG_2611_4c
Schwaebische Alb_JS scorie 4
Schwaebische Alb_JS scorie 2

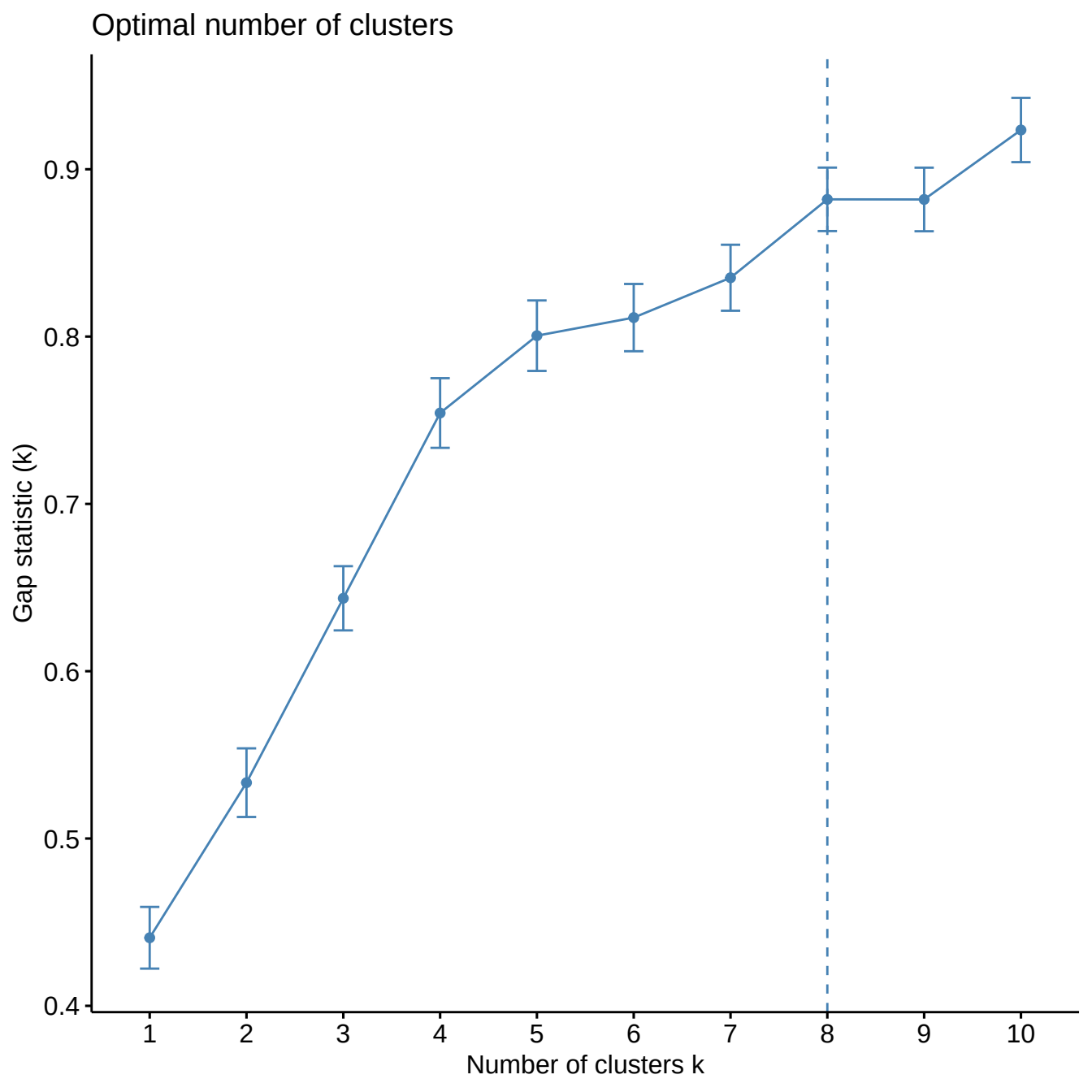

Factor map
OEG_2611_1c
Sambre Meuse_B_Revaux_4
Condroz_SLCON013
Condroz_SLCON010
Schwaebische Alb_JS scorie 3
Condroz_SLCON004
Minette_2424
Sambre Meuse_Baterage_1
Condroz_SLCON002
OEG_2611_2c
Condroz_ORCON001
Condroz_SLCON014
Schwaebische Alb_JS scorie 2
OEG_2611_1b
Bayerische Schwaben_SLBS−28−A
Bayerische Schwaben_SLBS−35−A
Condroz_SLCON008
Schwaebische Alb_Fd 130. Bef 153
OEG_2611_4a
Bayerische Schwaben_SLBS−7−1
Bayerische Schwaben_SLBS−28−B
Bayerische Schwaben_SLBS−34−A
Condroz_SLCON011
Schwaebische Alb_JS scorie 6
Schwaebische Alb_JS scorie 4
OEG_2611_3c
Bayerische Schwaben_SLBS−31−A
OEG_2611_4c
OEG_2611_3a
Bayerische Schwaben_SLBS−9−2
Schwaebische Alb_JS scorie 2
Bayerische Schwaben_SLBS−34−B
Schwaebische Alb_JS scorie 10
Sambre Meuse_B_Ferrieres_2
Bayerische Schwaben_SLBS−35−B
Bayerische Schwaben_SLBS−9−1
Schwaebische Alb_JS scorie 9
Sambre Meuse_B_Ferrieres_1
OEG_2611_3b
Bayerische Schwaben_SLBS−7−2
OEG_2611_2a
Bayerische Schwaben_ErzBS 1
Bayerische Schwaben_SLBS−7−3
Schwaebische Alb_JS scorie 7
Bayerische Schwaben_SLBS−31−B
Bayerische Schwaben_ErzBS 14 2
Schwaebische Alb_JS scorie 5
Bayerische Schwaben_ErzBS 16
Bayerische Schwaben_ErzBS 12
Bayerische Schwaben_ErzBS 2
Bayerische Schwaben_ErzBS 10
0.6
0.4
0.2
0.0
−0.2
−0.25
0.00
0.25
0.50
0.75
Dim2 (18.7%)
Dim1 (39.7%)
cluster
1
2

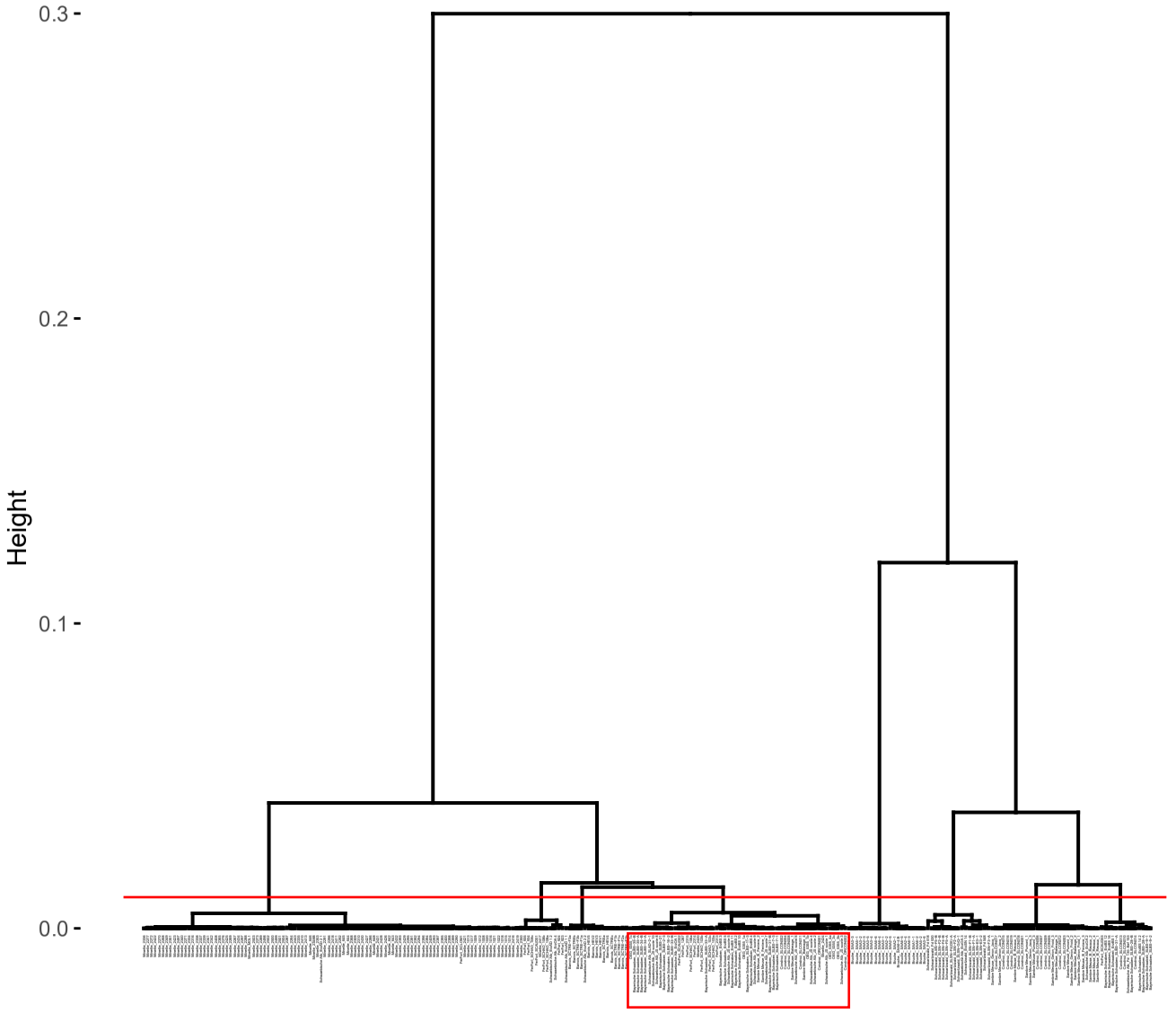
OEG 5355

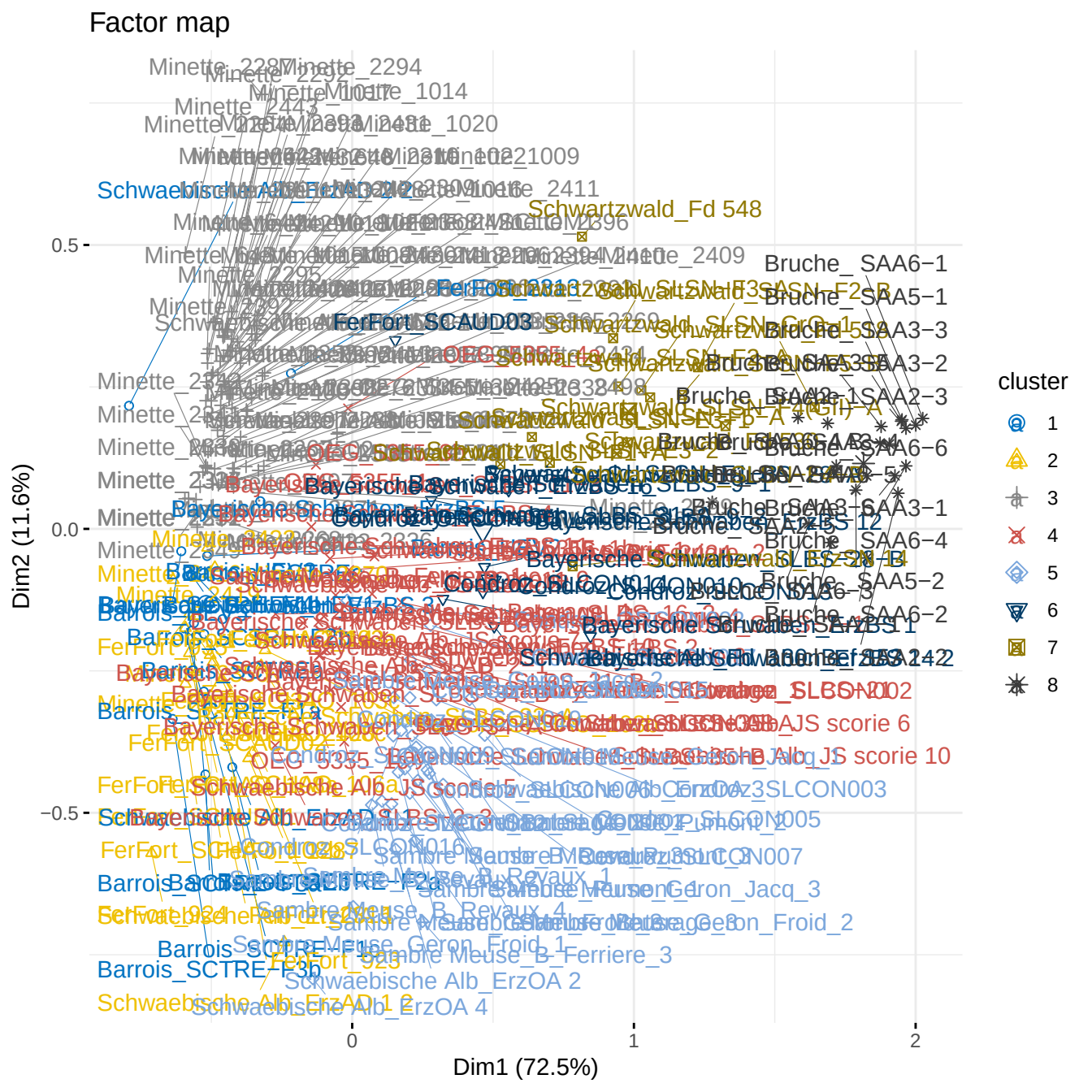

Scree plot
72.5%
11.6%
10.7%
2.7%
0.8%
0.6%
0.3%
0.3%
0.2%
0.2%
Percentage of explained variances
0
20
40
60
1
2
3
4
5
6
7
8
9
10
Dimensions

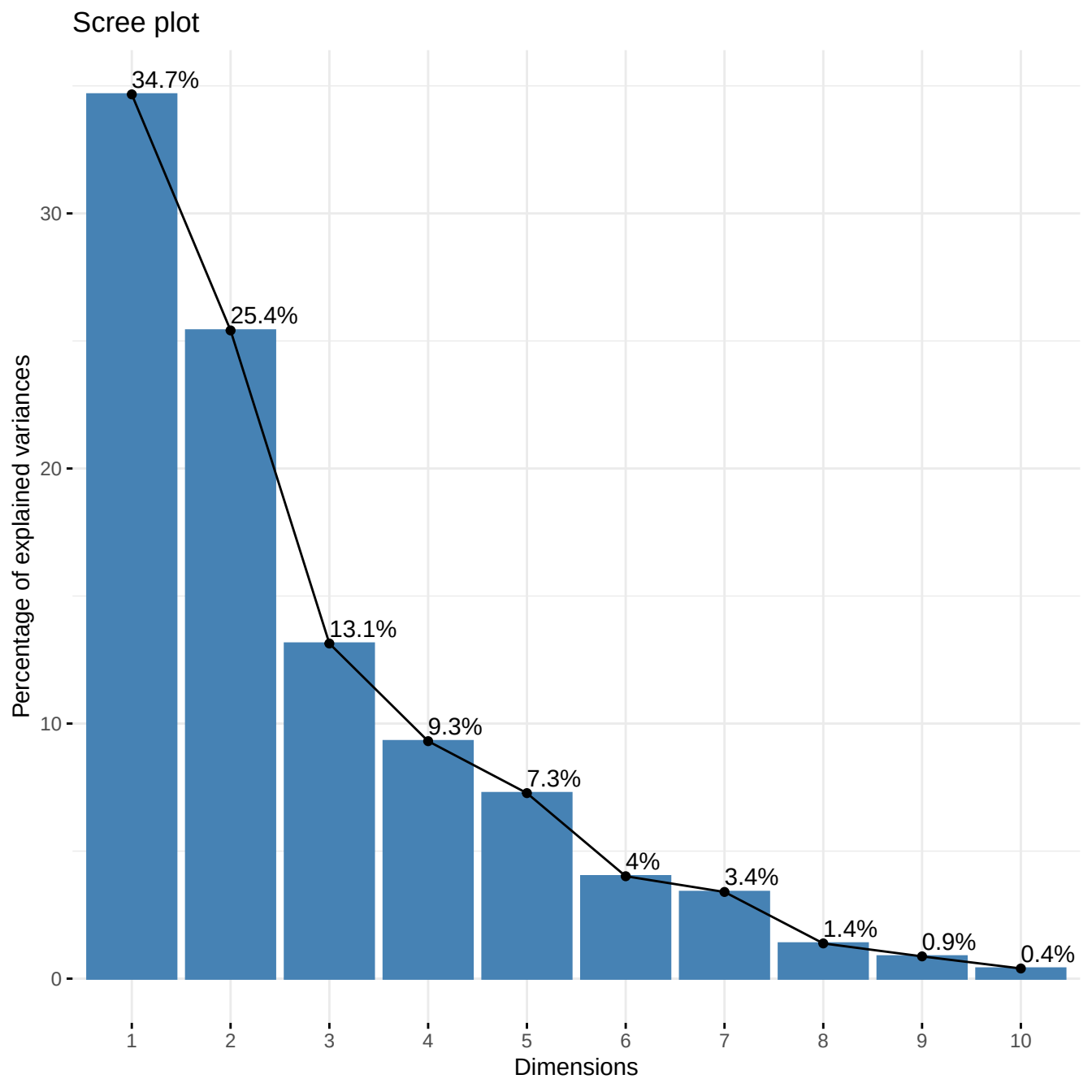

Variables − PCA
Xij_Th
Xij_U
Xij_Yb
Xij_Dy
Xij_Eu
Xij_Gd
Xij_Sm
Xij_Ce
Xij_Nd
Xij_Pr
Xij_Y
Xij_La
contrib
60
40
20
0.25
0.20
0.15
0.10
0.05
0.00
−0.05
−0.25
0.00
0.25
0.50
Dim2 (11.6%)
Dim1 (72.5%)

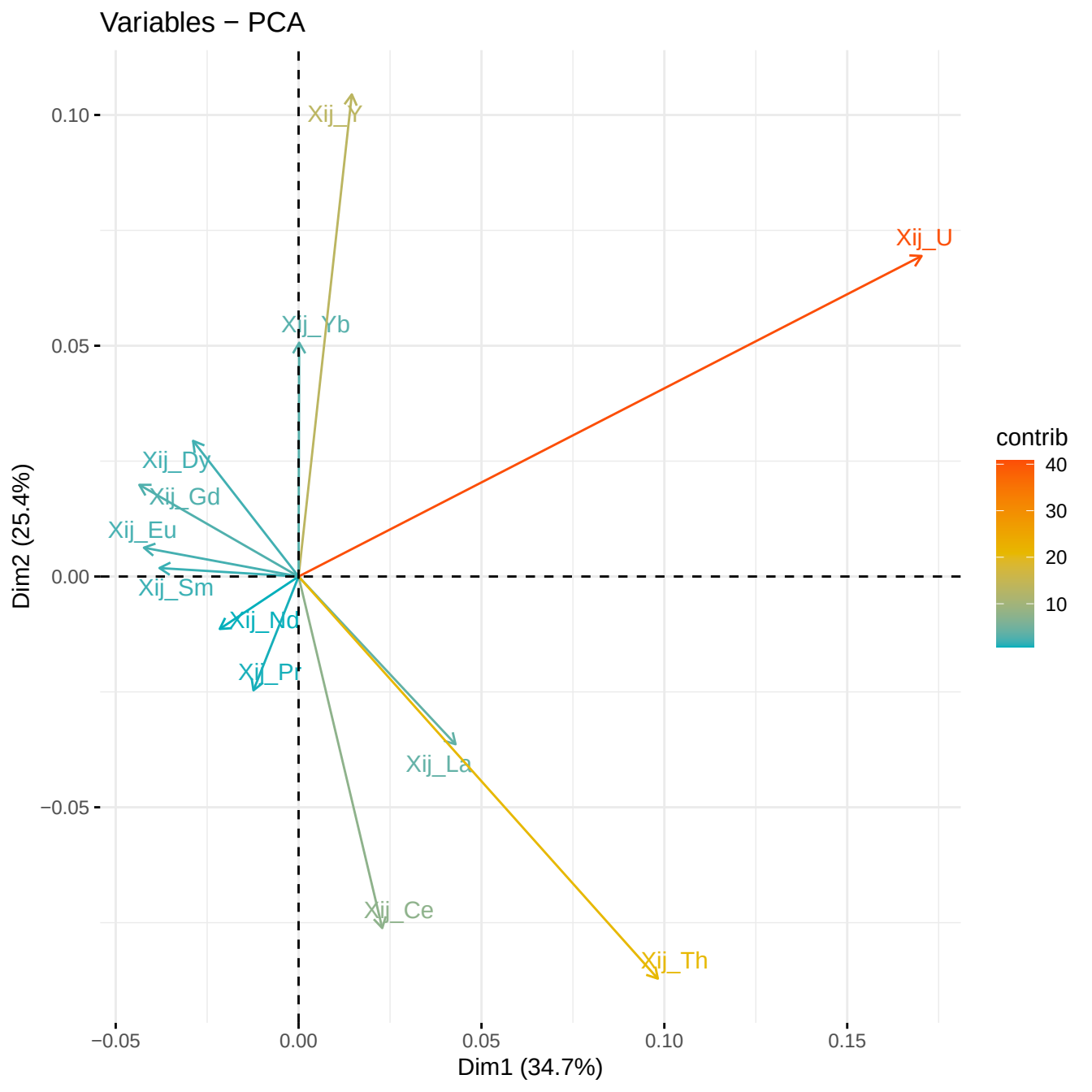

Individuals − PCA
Dim1 (72.5%)
Dim2 (11.6%)
0.5
0.0
−0.5
0
1
2
Groupes
Bar
Furnace slag
Ore
smelting slag
Smelting slag?

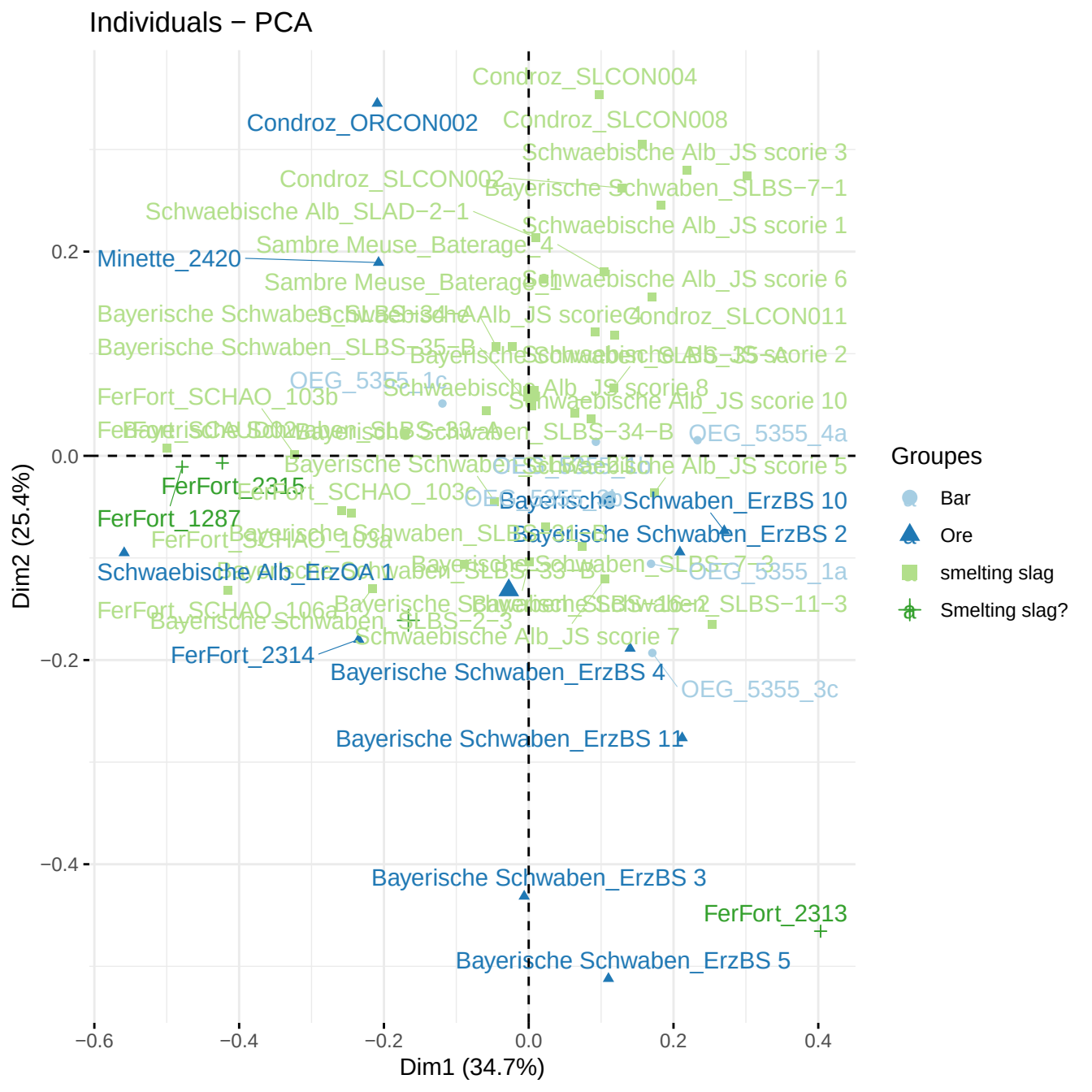

Optimal number of clusters
Gap statistic (k)
0.9
0.8
0.7
0.6
0.5
0.4
1
2
3
4
5
6
7
8
9
10
Number of clusters k

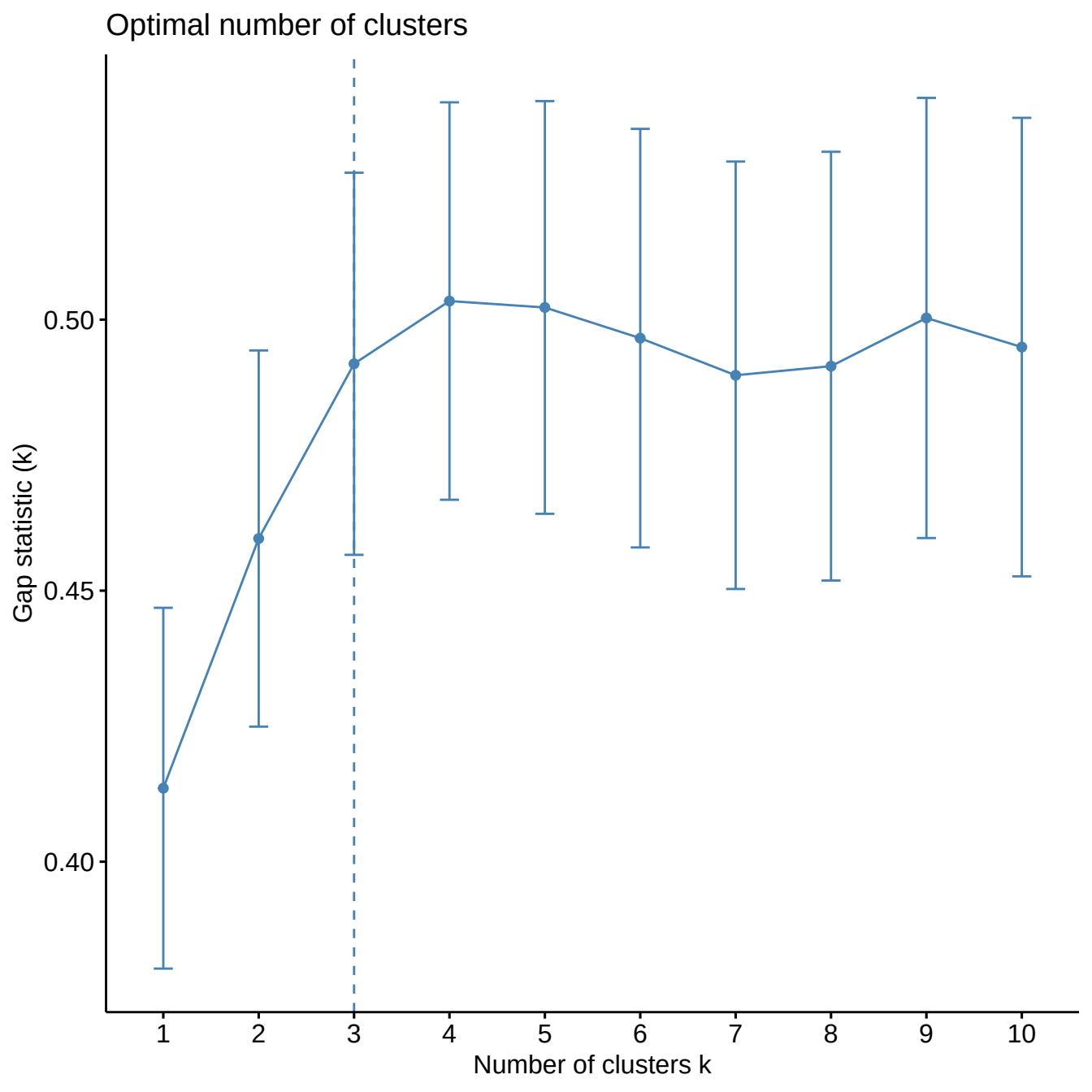

Height
0.3
0.2
0.1
0.0

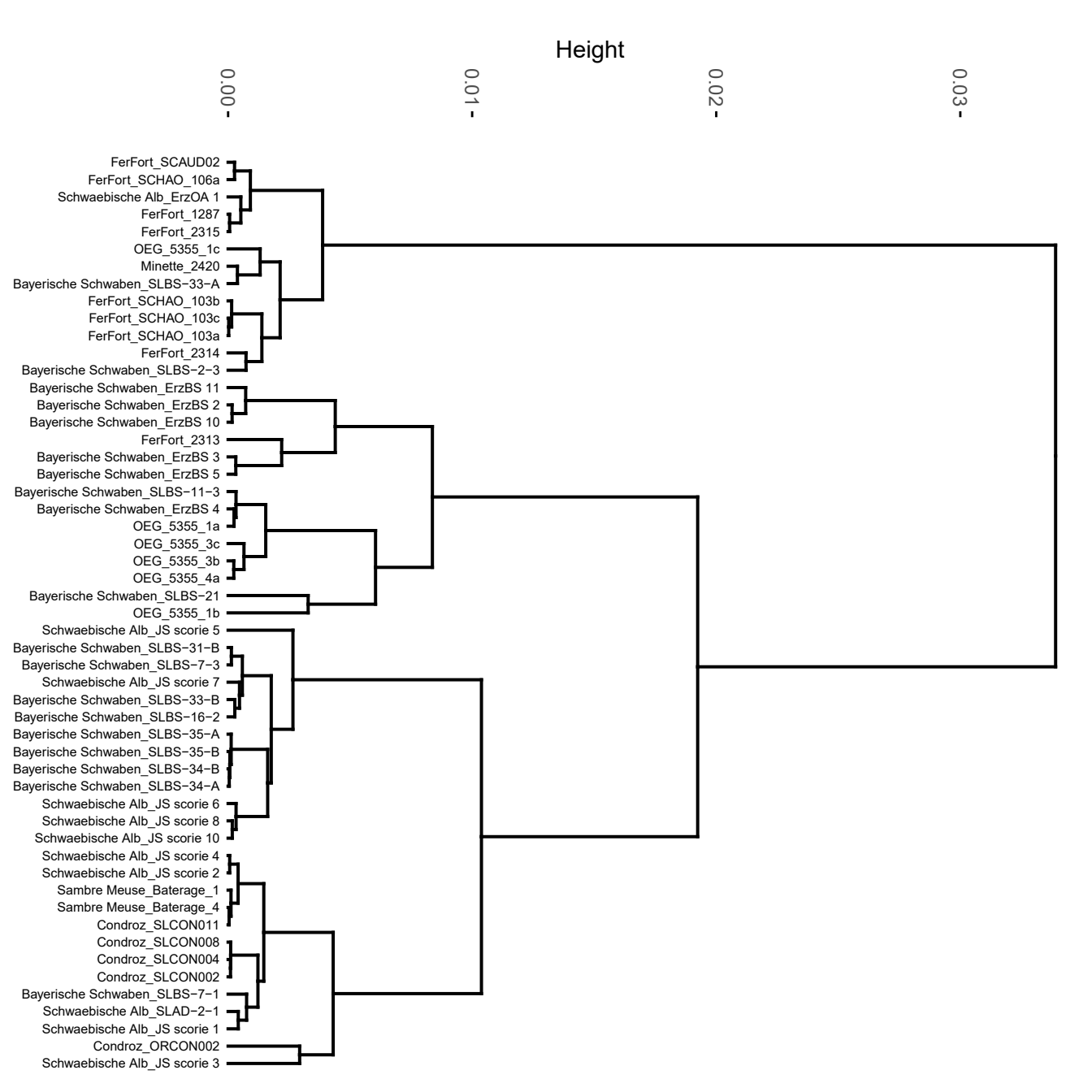

Factor map
Dim2 (11.6%)
Dim1 (72.5%)
0.5
0.0
−0.5
0
1
2
cluster
1
2
3
4
5
6
7
8

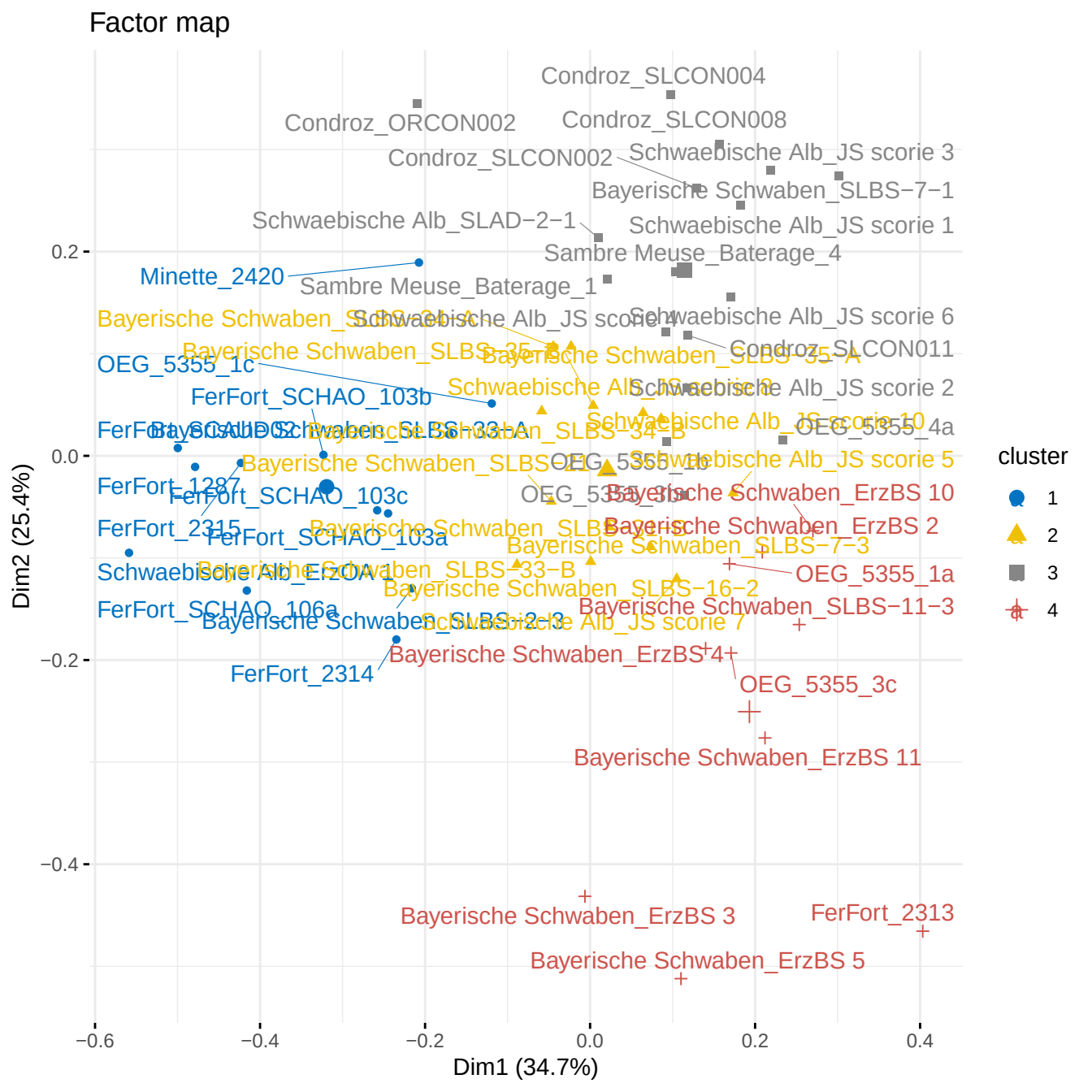

Scree plot
34.7%
25.4%
13.1%
9.3%
7.3%
4%
3.4%
1.4%
0.9%
0.4%
Percentage of explained variances
0
10
20
30
1
2
3
4
5
6
7
8
9
10
Dimensions


Variables − PCA
Xij_Y
Xij_U
Xij_Yb
Xij_Dy
Xij_Gd
Xij_Eu
Xij_Sm
Xij_Nd
Xij_Pr
Xij_La
Xij_Ce
Xij_Th
contrib
40
30
20
10
0.10
0.05
0.00
−0.05
Dim2 (25.4%)
−0.05
0.00
0.05
0.10
0.15
Dim1 (34.7%)


Individuals − PCA
Condroz_SLCON004
Condroz_ORCON002
Condroz_SLCON008
Schwaebische Alb_JS scorie 3
Condroz_SLCON002
Bayerische Schwaben_SLBS−7−1
Schwaebische Alb_SLAD−2−1
Schwaebische Alb_JS scorie 1
Sambre Meuse_Baterage_4
Minette_2420
Schwaebische Alb_JS scorie 6
Sambre Meuse_Baterage_1
Condroz_SLCON011
Schwaebische Alb_JS scorie 4
Bayerische Schwaben_SLBS−35−A
Schwaebische Alb_JS scorie 2
OEG_5355_1c
Schwaebische Alb_JS scorie 8
FerFort_SCHAO_103b
Schwaebische Alb_JS scorie 10
OEG_5355_4a
Bayerische Schwaben_SLBS−34−B
Schwaebische Alb_JS scorie 5
FerFort_2315
Bayerische Schwaben_ErzBS 10
FerFort_1287
Bayerische Schwaben_ErzBS 2
Schwaebische Alb_ErzOA 1
OEG_5355_1a
Bayerische Schwaben_SLBS−11−3
Bayerische Schwaben_SLBS−2−3
Schwaebische Alb_JS scorie 7
FerFort_2314
Bayerische Schwaben_ErzBS 4
OEG_5355_3c
Bayerische Schwaben_ErzBS 11
Bayerische Schwaben_ErzBS 3
FerFort_2313
Bayerische Schwaben_ErzBS 5
0.2
0.0
−0.2
−0.4
−0.6
−0.4
−0.2
0.0
0.2
0.4
Dim2 (25.4%)
Dim1 (34.7%)
Groupes
Bar
Ore
smelting slag
Smelting slag?


Optimal number of clusters
Gap statistic (k)
0.50
0.45
0.40
1
2
3
4
5
6
7
8
9
10
Number of clusters k


Height
0.00
0.01
0.02
0.03
FerFort_SCAUD02
FerFort_SCHAO_106a
Schwaebische Alb_ErzOA 1
FerFort_1287
FerFort_2315
OEG_5355_1c
Minette_2420
Bayerische Schwaben_SLBS−33−A
FerFort_SCHAO_103b
FerFort_SCHAO_103c
FerFort_SCHAO_103a
FerFort_2314
Bayerische Schwaben_SLBS−2−3
Bayerische Schwaben_ErzBS 11
Bayerische Schwaben_ErzBS 2
Bayerische Schwaben_ErzBS 10
FerFort_2313
Bayerische Schwaben_ErzBS 3
Bayerische Schwaben_ErzBS 5
Bayerische Schwaben_SLBS−11−3
Bayerische Schwaben_ErzBS 4
OEG_5355_1a
OEG_5355_3c
OEG_5355_3b
OEG_5355_4a
Bayerische Schwaben_SLBS−21
OEG_5355_1b
Schwaebische Alb_JS scorie 5
Bayerische Schwaben_SLBS−31−B
Bayerische Schwaben_SLBS−7−3
Schwaebische Alb_JS scorie 7
Bayerische Schwaben_SLBS−33−B
Bayerische Schwaben_SLBS−16−2
Bayerische Schwaben_SLBS−35−A
Bayerische Schwaben_SLBS−35−B
Bayerische Schwaben_SLBS−34−B
Bayerische Schwaben_SLBS−34−A
Schwaebische Alb_JS scorie 6
Schwaebische Alb_JS scorie 8
Schwaebische Alb_JS scorie 10
Schwaebische Alb_JS scorie 4
Schwaebische Alb_JS scorie 2
Sambre Meuse_Baterage_1
Sambre Meuse_Baterage_4
Condroz_SLCON011
Condroz_SLCON008
Condroz_SLCON004
Condroz_SLCON002
Bayerische Schwaben_SLBS−7−1
Schwaebische Alb_SLAD−2−1
Schwaebische Alb_JS scorie 1
Condroz_ORCON002
Schwaebische Alb_JS scorie 3


Factor map
Condroz_SLCON004
Condroz_ORCON002
Condroz_SLCON008
Condroz_SLCON002
Schwaebische Alb_JS scorie 3
Bayerische Schwaben_SLBS−7−1
Schwaebische Alb_SLAD−2−1
Schwaebische Alb_JS scorie 1
Sambre Meuse_Baterage_4
Minette_2420
Sambre Meuse_Baterage_1
Schwaebische Alb_JS scorie 6
Schwaebische Alb_JS scorie 4
Condroz_SLCON011
Bayerische Schwaben_SLBS−35−A
OEG_5355_1c
Schwaebische Alb_JS scorie 2
FerFort_SCHAO_103b
Schwaebische Alb_JS scorie 10
OEG_5355_4a
Bayerische Schwaben_SLBS−34−B
Schwaebische Alb_JS scorie 5
Bayerische Schwaben_SLBS−33−A
OEG_5355_4b
FerFort_1287
FerFort_SCHAO_103c
OEG_5355_3b
Bayerische Schwaben_ErzBS 10
Bayerische Schwaben_ErzBS 2
FerFort_2315
FerFort_SCHAO_103a
Bayerische Schwaben_SLBS−7−3
Schwaebische Alb_ErzOA
Bayerische Schwaben_SLBS−33−B
OEG_5355_1a
Bayerische Schwaben_SLBS−16−2
FerFort_SCHAO_106a
Bayerische Schwaben_SLBS−11−3
Bayerische Schwaben_SLBS−2−3
Schwaebische Alb_JS scorie 7
Bayerische Schwaben_ErzBS 4
FerFort_2314
OEG_5355_3c
Bayerische Schwaben_ErzBS 11
Bayerische Schwaben_ErzBS 3
FerFort_2313
Bayerische Schwaben_ErzBS 5
0.2
0.0
−0.2
−0.4
−0.6
−0.4
−0.2
0.0
0.2
0.4
Dim2 (25.4%)
Dim1 (34.7%)
cluster
1
2
3
4