


Analysis of constancy columns in large-scale vegetation survey: possible solutions

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Joop H.J. Schaminée, Gilles Thébaud, Camille Roux



Why to use constancy columns in large scale vegetation classifications and analyses?

1. An alternative for regions where relevés are still missing
2. Data can be easily excerpted and computerised
3. Calculation of diagnostic species with more general validity

Data used for testing

Stephan M. Hennekens
& Joop Schaminée

Cynosurion cristati

107 constancy columns
Based on 5,133 relevés
738 species

Various geographical regions of
Western Europe (Great Britain,
Germany, the Netherlands,
Slovakia, Czech Republic, Poland,
Scandinavia)

Gilles Thébaud
& Camille Roux

Oxycocco-Sphagnetea
Scheuchzerio-Caricetea
Molinio-Juncetea
Phragmito-Magno-Caricetea
22 alliances

852 constancy columns
Based on 19,452 relevés
1,251 species

Various geographical regions of
temperate Western Europe (France,
Belgium, the Netherlands, Germany,
Switzerland, Austria, Czech
Republic, Great Britain etc.)

JUICE program

Work with constancy columns

Constancy columns
used as 'relevés'

Relevés 22		1111111111222
Species 1251		1234567890123456789012
Festuca pratensis	0	4ma.....a+.....
Veronica chamaedrys	0	4.r.....
Bellis perennis	0	4.+.....a.....
Rumex acetosa	0	4b+.....a...+a.....
Cerastium fontanum	0	4al.....
Bromus hordeaceus	0	4+.....
Dactylorhiza latifolia	0	4.l.....r.
Trisetum flavescens	0	4.+.....
Ranunculus acris	0	4ba.....+...ra.....
Trifolium dubium	0	4a.....
Trifolium pratense	0	4aa.....l.a.....+
Ajuga reptans	0	3ba.....
Phleum pratense	0	3++.....a.l.l.....
Anthriscus sylvestris	0	3.....
Pimpinella major	0	3.a.....
Leontodon autumnalis	0	3+.....b+.....a
Cynosurus cristatus	0	3b+.....a.....
Taraxacum campyloides	0	3.rb.....m.b.....
Polygonum bistorta	0	3ba.....a...+

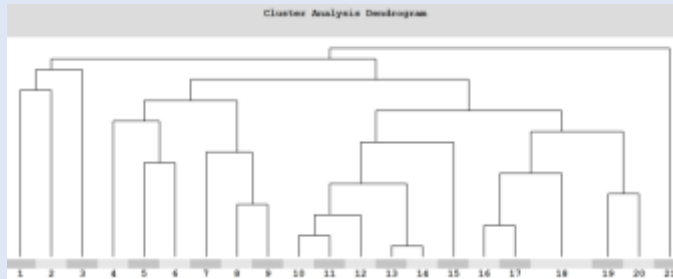
Species constancy
used as 'cover'

Constancy columns
as randomly generated relevés
in a virtual relevé table

All table is restored – plots
are generated randomly
from species constancies

Constancy columns as 'relevés'

Analytical tools in the JUICE program



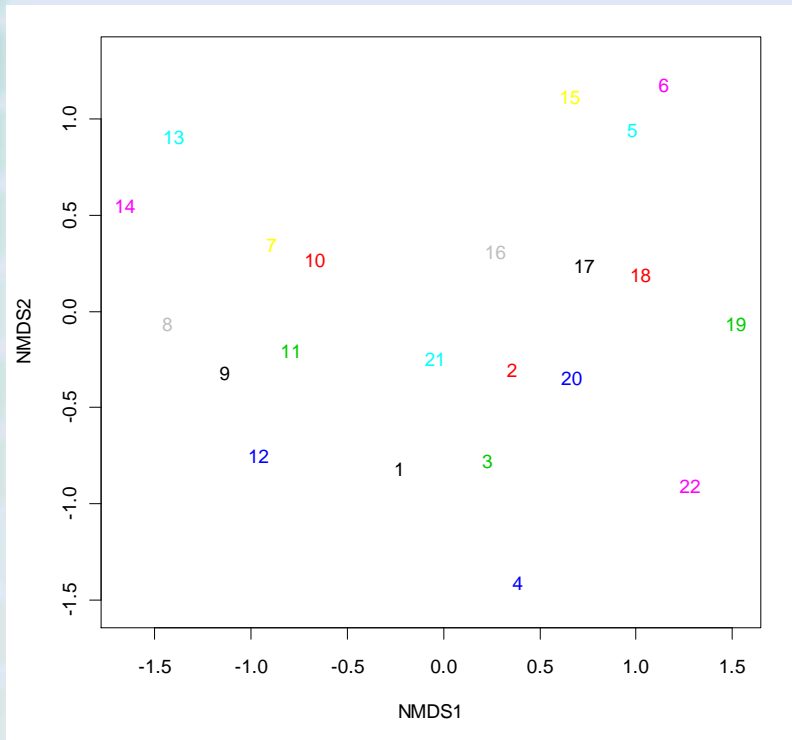
The same process as in
phytosociological tables

*Each column has the same
value in classification!*

- Classification
- Ordination
- Fidelity calculation
- Manual ordering
- Searching the most similar columns
- Merging columns
- Data stratification
- Combination with relevé tables
- Assignment of new relevés to constancy columns

Constancy columns as 'relevés'

Analytical tools in the JUICE program

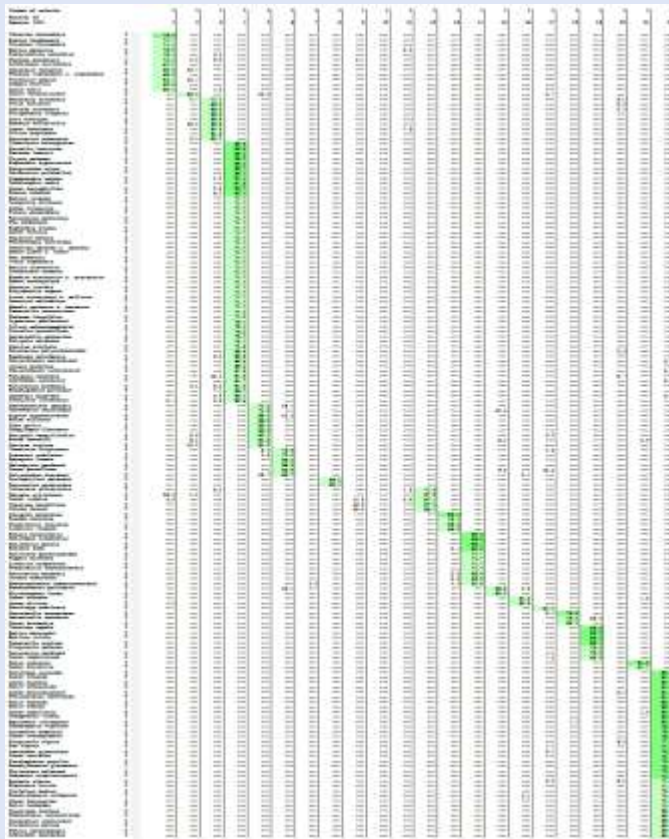


- Classification
- **Ordination**
- Fidelity calculation
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The same process as in
phytosociological tables

Constancy columns as 'relevés'

Analytical tools in the JUICE program



- Classification
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Fidelity calculation using:

- Presence/absence data Cover data

Transform.
of covers:

- None SQRT Log

Constancy columns as 'relevés'

Analytical tools in the JUICE program



```
Initial entry number:
Relevés 22                1111111111222
Species 1251             2124567890123456789012

Veronica chamaedrys      0  4.....
Bromus hordeaceus       0  41.....
Trisetum flavescens     0  14.....
Bellis perennis         0  14.....a.....
Dactylorhiza latifolia  0  14.....F.....
Festuca pratensis      0  4am.....a.l.....
Anthriscus sylvestris   0  3.....
Cerastium fontanum     0  14a.....
Festuca nigrescens s. nigrescens 0  3.....
Trifolium dubium       0  4a.....
Crepis biennis         0  3+.....
Carum carvi            0  3.....
Carum verticillatum    0  1.4.a.....m.l.
Serratula tinctoria   0  4.m.....a.....
```

```
Initial entry number:
Relevés 22                1111111111222
Species 1251             1324567890123456789012

Veronica chamaedrys      0  4r.....
Bromus hordeaceus       0  4.1.....
Trisetum flavescens     0  41.....
Bellis perennis         0  41.....a.....
Dactylorhiza latifolia  0  41.....F.....
Festuca pratensis      0  4am.....a.l.....
Anthriscus sylvestris   0  3.....
Cerastium fontanum     0  41a.....
Festuca nigrescens s. nigrescens 0  3.....
Trifolium dubium       0  4.a.....
Crepis biennis         0  3++.....
Carum carvi            0  3a.....
Carum verticillatum    0  14.a.....m.l.
Serratula tinctoria   0  4m.....a.....
```

- Classification
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,Drag and drop' function in the table

Constancy columns as 'relevés'

Analytical tools in the JUICE program

Relevés 22
Species 1251

40354433334343333335
304252678565717779248
6057471513633034750242
9053748577652269924700

Veronica obanadrys 0 4r
Bromus hordeaceus 0 4.1
Trisetum flavescens 0 41
Bellis perennis 0 41
Dactyloctenium aegyptium 0 41
Festuca pratensis 0 4am
Anthriscus sylvestris 0 3
Cerastium fontanum 0 4ia
Festuca nigrescens s. nigrescens 0 3
Trifolium dubium 0 4.a
Crepis biennis 0 3+
Cirsium arvense 0 3a
Cirsium verticillatum 0 14.a
Serratula tinctoria 0 4m
Inula salicina 0 4
Genista tinctoria 0 3r
Filipendula vulgaris 0 3
Iris sibirica 0 3
Stachys officinalis 0 r4b
Carex tostosa 0 3.1
Allium ampeloprasum 0 3
Ranunculus tuberosus 0 3+
Globularia bisnagarica 0 5
Drunella laciniata 0 5
Festuca lemnia 0 5

Euclidean Distance from Selected Relevé

Select relevé: 9 Tabernicola: 3
Data transformation: Tabernicola: 3
Click on error status of the table.

None
 Average
 Proportions

Relevé	Tabernicola	Tabernicola	Strength	Distance
1.121	10	20	1	1.121
1.800	10	11	1	1.800
1.800	10	10	1	1.800
1.800	10	10	1	1.800
1.819	7	0	2	1.819
1.888	11	11	2	1.888
1.790	17	13	3	1.790
1.776	18	15	3	1.776
1.748	18	18	3	1.748
1.752	18	18	2	1.752
1.780	8	8	2	1.780
1.774	11	10	2	1.774
1.811	6	6	1	1.811

Calculate ED and find the most similar relevés

- Classification
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Euclidean or Sorensen distance of all columns from that which was selected. (Menu Head > Store Values to Short Headers > Distance from Selected Relevé)

Constancy columns as 'relevés'

Analytical tools in the JUICE program

NOT ALLOWED!

Tool is missing.

- Classification
- Ordination
- Fidelity calculation
- Manual ordering
- Searching the most similar columns
- **Merging columns**
- Data stratification
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- Combination with relevé tables
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Constancy columns as 'relevés'

Analytical tools in the JUICE program

**Technically possible
NONSENSE!**

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- **Combination with relevé tables**
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Species constancy
used as 'cover'

Constancy columns as 'relevés'

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Species constancy
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JUICE program

Work with constancy columns

Constancy columns
as 'relevés'

Relevés 22		1111111111222
Species 1251		1234567890123456789012
Festuca pratensis	0	4ma.....a+.....
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Bromus hordeaceus	0	4+.....
Dactylorhiza latifolia	0	4.l.....r.
Trisetum flavescens	0	4.+.....
Ranunculus acris	0	4ba.....+...ra.....
Trifolium dubium	0	4a.....
Trifolium pratense	0	4aa.....l.a.....+
Ajuga reptans	0	3ba.....
Phleum pratense	0	3++.....a.l.l.....
Anthriscus sylvestris	0	3.....
Pimpinella major	0	3.a.....
Leontodon autumnalis	0	3+.....b.+.....a
Cynosurus cristatus	0	3b+.....a.....
Taraxacum campyloides	0	3.rb.....m.b.....
Polygonum bistorta	0	3ba.....a...+

Species constancy
used as 'cover'

Constancy columns
as randomly generated relevés
in a virtual relevé table

The image shows a large, faded virtual relevé table. A white inset on the right side provides a detailed view of the data, showing a grid of species constancy columns (represented by letters like 'a', 'b', 'r', 'm') and their corresponding values (0 or 1) across different relevés. The inset shows a pattern of 1s and 0s, with some 1s appearing in specific columns, indicating the presence of a species in a particular relevé.

All table is restored – plots
are generated randomly
from species constancies

JUICE program

Work with constancy columns

Constancy columns
as 'relevés'

```

Relevés 22          1111111111222
Species 1251       1234567890123456789012

Festuca pratensis 0 4ma.....a+.....
Veronica chamaedrys 0 4.r.....
Bellis perennis 0 4.+.....a.....
Rumex acetosa 0 4b+.....a...+a.....
Cerastium fontanum 0 4al.....
Bromus hordeaceus 0 4+.....
Dactylorhiza latifolia 0 4.l.....r.
Trisetum flavescens 0 4.+.....
Ranunculus acris 0 4ba.....+...ra.....
Trifolium dubium 0 4a.....
Trifolium pratense 0 4aa.....l.a.....+
Ajuga reptans 0 3ba.....
Phleum pratense 0 3++.....a.l.l.....
Anthriscus sylvestris 0 3.....
Pimpinella major 0 3.a.....
Leontodon autumnalis 0 3+.....b.+.....a
Cynosurus cristatus 0 3b+.....a.....
Taraxacum campylodes 0 3.rb.....m.b.....
Polygonum bistorta 0 3ba.....a..+.....
    
```

Species constancy
used as 'cover'

Constancy columns
as randomly generated relevés
in a virtual relevé table

		20
Sp1	0	100
Sp2	0	95
Sp3	0	90
Sp4	0	85
Sp5	0	80
Sp6	0	75
Sp7	0	70
Sp8	0	65
Sp9	0	60
Sp10	0	55
Sp11	0	50
Sp12	0	45
Sp13	0	40
Sp14	0	35
Sp15	0	30
Sp16	0	25
Sp17	0	20
Sp18	0	15
Sp19	0	10
Sp20	0	5

Initial entry number:

```

Relevés 20          11111111112
Species 20          12345678901234567890

Sp1 0 11111111111111111111
Sp2 0 111111111111111111 11
Sp3 0 11111 11 111111111111
Sp4 0 11 11111 11111111111
Sp5 0 11111111 111111 1 1
Sp6 0 1 1 1 1 11111111 111
Sp7 0 11 1 1 111 1111111 1
Sp8 0 11 1 1 111 111 1 1 1
Sp9 0 11 1 1 1 1 11 11111
Sp10 0 1 1 11 11111 111
Sp11 0 11 111 111 111
Sp12 0 11 1 1 1 1 11 1 1
Sp13 0 11 1 1 1 11 111
Sp14 0 1111 1 1 1 1
Sp15 0 1 1 111 1111 1
Sp16 0 1 11 11 111
Sp17 0 1 1 1 1 1 1
Sp18 0 1 1 1 1 1
Sp19 0 1 1 1 1
Sp20 0 1
    
```


Constancy columns as randomly generated relevés in a virtual relevé table

Analytical tools in the JUICE program

**NOT ENABLED
DIRECTLY!**

Direct tool is missing.
Technically too difficult.

Original position	New position
1	1
3	2
4	3
2	4
16	5
17	6
5	7
6	8
15	9
7	10
10	11
8	12
9	13
11	14
12	15
13	16
14	17
18	18
19	19
20	20
21	21
22	22

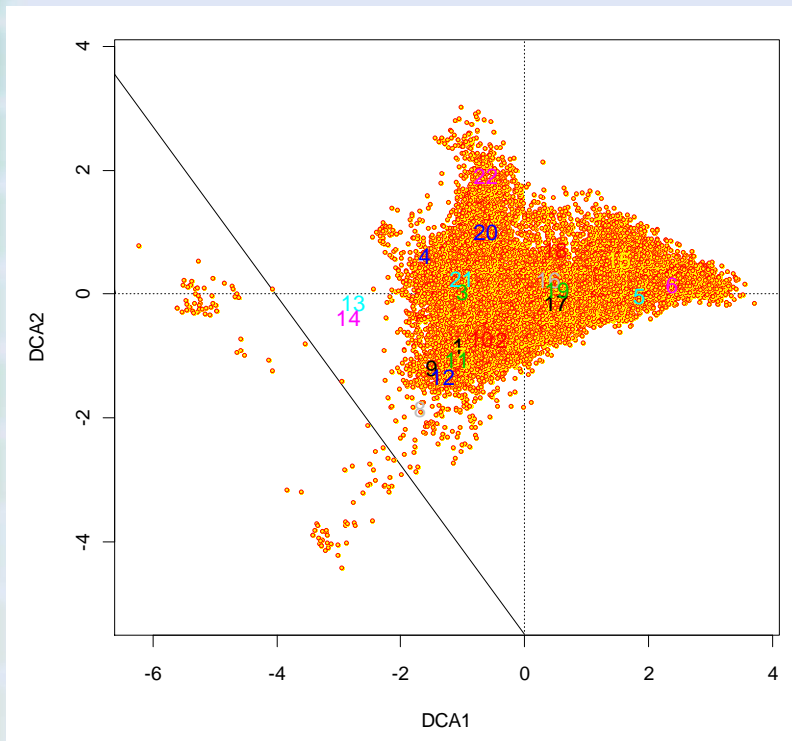
- **Classification**
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- Assignment of new relevés to constancy columns

Constancy columns can be re-ordered using a classification of synoptic table, where columns are used instead of relevés.

Menu ‚Synoptic Tables‘ > ‚Manipulation with Columns‘ > ‚Sorting Columns by Clipboard Info‘

Constancy columns as randomly generated relevés in a virtual relevé table

Analytical tools in the JUICE program



Constancy columns as group centroids

- Classification
- **Ordination**
- Fidelity calculation
- Manual ordering
- Searching the most similar columns
- Merging columns
- Data stratification
- Combination with relevé tables
- Assignment of new relevés to constancy columns

Display Parameters

<input type="checkbox"/> Species	<input checked="" type="checkbox"/> Sites
<input type="radio"/> none	<input checked="" type="radio"/> none
<input type="radio"/> as points	<input type="radio"/> as points
<input type="radio"/> with some labels	<input type="radio"/> with some labels
<input type="radio"/> with all labels	<input type="radio"/> with all labels
<input checked="" type="radio"/> with all labels	<input type="radio"/> with group labels
<input type="checkbox"/> Envelopes	<input type="checkbox"/> Spiderplot
	<input checked="" type="checkbox"/> Centroids

Constancy columns as randomly generated relevés in a virtual relevé table

Analytical tools in the JUICE program

Percentage synoptic table with fidelity (Phi coeff. C) (22 columns)

Number of relevés:	334	3356	2495	39	1279	3096
Relevés 13452						
Species 1251	1	2	3	4	5	6
Festuca pratensis	0	71.2	---	---	---	---
Ranunculus acris	0	66.3	8.5	3.0	---	---
Trifolium pratense	0	64.7	3.0	2.1	---	---
Rumex acetosa	0	64.3	9.3	---	---	---
Cerastium fontanum	0	61.8	4.0	---	---	---
Poa pratensis	0	59.5	---	---	---	---
Trifolium repens	0	57.8	3.8	0.7	---	---
Veronica chamaedrya	0	56.0	---	---	---	---
Scilla perennis	0	55.0	---	---	---	---
Dactylorhiza latifolia	0	55.3	---	---	---	---
Trisetum flavescens	0	54.2	---	---	---	---
Lathyrus pratensis	0	52.1	3.8	2.9	---	---
Ajuga reptans	0	51.8	7.3	---	---	---
Anthoxanthum odoratum	0	51.4	10.6	---	---	---
Poa trivialis	0	50.7	2.9	---	---	---
Juncus acutiflorus	0	---	53.0	---	11.6	---
Carex verticillata	0	---	52.9	0.4	---	2.6
Serratula tinctoria	0	---	0.4	81.4	---	---
Thymus praecox	0	---	---	88.1	---	---
Deschampsia cespitosa	0	---	---	79.8	---	---
Festuca lemmonii	0	---	---	76.3	---	---
Sanguisorba minor	0	---	---	71.3	---	---
Bromus erectus	0	---	---	70.6	---	---
Centaurium pulchellum	0	---	---	64.8	---	---
Globularia bisnagariorum	0	---	---	60.3	---	---
Allium schoenoprasum	0	9.0	---	58.1	---	---
Poa hederifolia	0	---	---	57.7	---	---
Sedum album s. album	0	---	---	57.7	---	---
Carex caryophyllacea	0	1.9	---	53.2	---	---
Frunella laciniata	0	---	---	52.1	---	---
Euphorbia cyparissias	0	---	---	51.5	---	---
Hippocrepis comosa	0	---	---	50.7	---	---
Erica tetralix	0	---	11.4	---	67.1	---
Hyssopus officinalis	9	---	---	---	60.0	2.5
Odontochloa sphaerica	9	---	---	---	59.9	8.0
Marthamium oxifragum	0	---	---	---	53.0	---
Cladonia species	9	---	---	---	52.8	24.0
Polytrichum strictum	9	---	---	---	52.2	57.6
Eriophorum vaginatum	0	---	---	---	50.0	57.2
Sphagnum magellanicum	9	---	---	---	49.2	55.4
Carex pauciflora	0	---	---	---	---	54.3
Vaccinium uliginosum	0	---	---	---	1.1	54.1
Sphagnum rubellum	9	---	---	---	31.2	55.4

- Classification
- Ordination
- Fidelity calculation
- Manual ordering
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The same process as in tables of real relevés

Fidelity calculation using:

Presence/absence data Cover data

Constancy columns as randomly generated relevés in a virtual relevé table

Analytical tools in the JUICE program



Percentage synoptic table with fidelity (Fm coeff. C) (22 columns)

Number of relevés:	334	3356	3885	33	1278	3884	443
Relevés 1942	1	3	3	4	5	8	7
Species 1251							
<i>Festuca pratensis</i>	0	71.2	...	...	...	...	...
<i>Ranunculus acris</i>	0	66.2	8.9	3.0	...	...	...
<i>Trifolium pratense</i>	0	64.7	3.8	2.1	...	...	...
<i>Bromus secalis</i>	0	64.3	6.3	...	...	...	...
<i>Cerastium fontanum</i>	0	61.8	4.0	...	...	...	...
<i>Poa pratensis</i>	0	58.5	...	8.7	...	...	...
<i>Trifolium repens</i>	0	57.8	3.6	...	...	...	...
<i>Veronica chamaedrys</i>	0	56.6	...	...	...	...	...
<i>Helictes persicis</i>	0	55.2	...	...	...	...	...
<i>Dactylorhiza latifolia</i>	0	55.2	...	...	...	...	...
<i>Trietichon flavescens</i>	0	54.2	...	...	...	...	...
<i>Lactuca pratensis</i>	0	52.2	3.8	2.9	...	...	...
<i>Ajuga reptans</i>	0	51.8	7.2	...	...	...	...
<i>Anthoxanthum odoratum</i>	0	52.4	10.4	...	...	...	...
<i>Poa trivialis</i>	0	50.7	2.9	...	...	...	...
<i>Juncus acutiflorus</i>	0	...	53.8	...	...	11.6	...
<i>Carex verticillata</i>	0	...	52.9	8.4	...	5.4	...
<i>Serratula tinctoria</i>	0	...	0.4	61.4	...	...	...
<i>Thymus praecox</i>	0	...	...	46.2	...	...	...
<i>Deschampsia media</i>	0	...	...	8.7	...	...	...
<i>Festuca lemmonii</i>	0	...	...	76.3	...	...	...
<i>Sanguisorba minor</i>	0	...	...	71.3	...	...	...
<i>Bromus erectus</i>	0	...	...	70.8	...	...	...
<i>Conostachium polichalcum</i>	0	...	...	64.8	...	...	...
<i>Dianthus barbatus</i>	0	...	...	60.3	...	...	...
<i>Allium schoenoprasum</i>	0	5.0	...	56.2	...	...	...
<i>Poa bulbosa</i>	0	...	...	57.7	...	...	...
<i>Sedum album s. album</i>	0	...	...	57.2	...	...	...
<i>Carex corymbosa</i>	0	1.9	...	52.3	...	...	...
<i>Prunella laciniata</i>	0	...	...	52.1	...	...	...
<i>Euphorbia cyparissias</i>	0	...	...	51.5	...	...	...
<i>Hippocrepis comosa</i>	0	...	...	50.7	...	...	...

Percentage synoptic table with fidelity (Fm coeff. C) (22 columns)

Number of relevés:	334	3356	3885	1278	3884	30
Relevés 1942	1	3	3	4	5	4
Species 1251						
<i>Festuca pratensis</i>	0	71.2	...	...	...	...
<i>Ranunculus acris</i>	0	66.0	8.9	3.0	...	...
<i>Trifolium pratense</i>	0	64.7	3.8	2.1	...	...
<i>Bromus secalis</i>	0	64.3	6.3	...	...	...
<i>Cerastium fontanum</i>	0	60.9	4.0	...	...	...
<i>Poa pratensis</i>	0	58.5	...	8.7	...	...
<i>Trifolium repens</i>	0	57.8	3.6	...	...	...
<i>Veronica chamaedrys</i>	0	56.0	...	...	...	...
<i>Helictes persicis</i>	0	55.2	...	...	...	...
<i>Dactylorhiza latifolia</i>	0	55.2	...	...	...	...
<i>Trietichon flavescens</i>	0	54.2	...	...	...	...
<i>Lactuca pratensis</i>	0	52.1	3.8	2.9	...	...
<i>Ajuga reptans</i>	0	52.6	7.2	...	...	...
<i>Anthoxanthum odoratum</i>	0	52.4	10.4	...	...	...
<i>Poa trivialis</i>	0	50.7	2.9	...	...	...
<i>Juncus acutiflorus</i>	0	...	53.8	...	...	11.6
<i>Carex verticillata</i>	0	...	52.9	8.4	...	5.4
<i>Serratula tinctoria</i>	0	...	0.4	61.4	...	...
<i>Thymus praecox</i>	0	...	...	46.2	...	46.1
<i>Deschampsia media</i>	0	...	...	8.7	...	79.9
<i>Festuca lemmonii</i>	0	...	...	76.3	...	76.3
<i>Sanguisorba minor</i>	0	...	...	71.3	...	71.3
<i>Bromus erectus</i>	0	...	...	70.8	...	70.8
<i>Conostachium polichalcum</i>	0	...	...	64.8	...	64.8
<i>Dianthus barbatus</i>	0	...	...	60.3	...	60.3
<i>Allium schoenoprasum</i>	0	5.0	...	56.2	...	56.2
<i>Poa bulbosa</i>	0	...	...	57.7	...	57.7
<i>Sedum album s. album</i>	0	...	...	57.2	...	57.2
<i>Carex corymbosa</i>	0	1.9	...	52.3	...	52.3
<i>Prunella laciniata</i>	0	52.1	...	52.1
<i>Euphorbia cyparissias</i>	0	51.5	...	51.5
<i>Hippocrepis comosa</i>	0	50.7	...	50.7

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Drag and drop function in Synoptic tables

Constancy columns as randomly generated relevés in a virtual relevé table

Analytical tools in the JUICE program

	A	B	C
1	Column A	Column B	Euclidean distance between groups
2	1	2	3.272986709
3	1	3	3.315953721
4	1	4	4.430128695
5	1	5	4.458448567
6	1	6	4.396717481
7	1	7	3.713432419
8	1	8	3.818206508
9	1	9	3.732118145
10	1	10	3.718688093
11	1	11	3.28428726
12	1	12	4.794960434
13	1	13	3.948370943
14	1	14	4.221159057
15	1	15	4.078861172
16	1	16	3.780829932
17	1	17	3.683186003
18	1	18	4.211071128
19	1	19	4.381509395
20	1	20	4.073052507
21	1	21	3.795759127
22	1	22	4.53235442
23	2	3	2.110636892
24	2	4	3.59073473
25	2	5	3.136984075
26	2	6	3.281008724
27	2	7	2.749022612
28	2	8	2.849535983
29	2	9	2.970749403
30	2	10	2.660080606
31	2	11	2.802361819


- Classification
- Ordination
- Fidelity calculation
- Manual ordering
- Searching the most similar columns
- Merging columns
- Data stratification
- Combination with relevé tables
- Assignment of new relevés to constancy columns

Calculation of Euclidean distance between all pairs of columns
(Menu ‚Synoptic Tables‘ >
,Manipulation with Columns‘ >
,Merging – Min. Euclidean Distance‘)

Constancy columns as randomly generated relevés in a virtual relevé table

Analytical tools in the JUICE program

Simple removal of separators between groups



Relevés 19452	0	33333333333333333333333333333333
Species 1251	0	22222222233333333333333333333333
	0	1234567890123456789012345678901234567
Festuca pratensis	0	1..111.1.....1.....
Ranunculus acris	0	1.1111.1111.111111111.1.1.1
Trifolium pratense	0	1111.111.....
Rumex acetosa	0	111..111...111.1111111.111..
Cerastium fontanum	0	1.111.1.1.1.....
Poa pratensis	0	...1.111.....111.....
Trifolium repens	0	...11.111.111.....1.11.....
Veronica chamaedrys	0	..11.....1.....
Bellis perennis	0	..1.1.111.....
Dactylorhiza latifolia	0	.....
Trisetum flavescens	0	111.1.11.....
Lathyrus pratensis	0	..11.11.....11.11.11.....
Ajuga reptans	0	1.111..1.11.....1.1.1.....
Anthoxanthum odoratum	0	..1.1.1.11111111111111.1.1.
Poa trivialis	0	111..11.....11.1.1.111.11
Juncus acutiflorus	011111111111111
Carum verticillatum	01.1111.1111

- Classification
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1. Simple removal of separators

2. JUICE function

(Menu 'Synoptic Tables' >

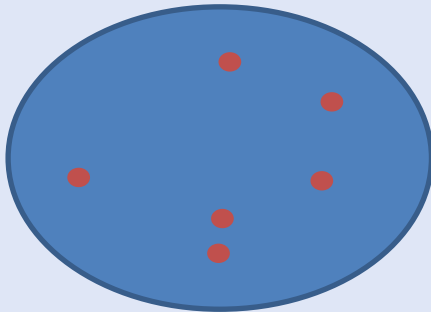
'Manipulation with Columns' > 'Merging -

'Manual Selection of Two Columns')

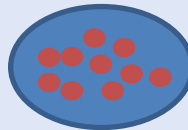
Constancy columns as randomly generated relevés in a virtual relevé table

Analytical tools in the JUICE program

Area A



Area B



- Classification
 - Ordination
 - Fidelity calculation
 - Manual ordering
 - Searching the most similar columns
 - Merging columns
 - Data stratification
 - Combination with relevé tables
 - Assignment of new relevés to constancy columns
1. Random selection of ,plots'
(Menu Head > Resampling > Random and Systematic Resampling)
 2. Removal of other plots from the table
(Menu Relevés > Delete White Relevés)

Constancy columns as randomly generated relevés in a virtual relevé table

Analytical tools in the JUICE program

Relevés 19495	9889988895899999999999999999999999	1	111111111111111111
Species 1292	5232933457633444444444444444444444		
	2459902456238988888889999966555		
	99202573086570345678901234565374		
Aulacomnium palustre	9	111111111111111111+.+....
Sphagnum magellanicum	9	111111111111111111	a+1.....+.5+4...1..
Polytrichum strictum	9	111111111111111111	.....+. ....1.+1a
Polytrichum commune	9	111111111111111111	.....1.....
Sphagnum capillifolium	9	1..111..111111111	+a.a.a.++5+.....
Sphagnum cuspidatum	9	.11...11.....+.
Gymnocolea inflata	9	.....	.....+. ....
Sphagnum russowii	9	.....	3134.3.3+5mm+44353
Number of relevés:		32	43
Relevés 19495			
Species 1292		1	2
Aulacomnium palustre	9	100	21
Sphagnum magellanicum	9	100	33
Polytrichum strictum	9	97	58
Polytrichum commune	9	81	23
Sphagnum capillifolium	9	88	28
Sphagnum cuspidatum	9	34	9
Gymnocolea inflata	9	19	7
Sphagnum russowii	9	19	95

- Classification
- Ordination
- Fidelity calculation
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- Searching the most similar columns
- Merging columns
- Data stratification
- Combination with relevé tables
- Assignment of new relevés to constancy columns

Combination of two tables
(Menu File > Append)

Constancy columns as randomly generated relevés in a virtual relevé table

Analytical tools in the JUICE program

Number of relevés:	1279	2096	443		
Relevés 19495					
Species 1292	5	6	7		
19489	409692	23	0.0	0.0	0.0
19490	409702	23	2.8	5.5	0.1
19491	414795	23	0.7	2.4	0.0
19492	414796	23	1.0	1.3	0.0
19493	414797	23	1.7	3.5	0.0
19494	414798	23	2.1	3.6	0.0
19495	414799	23	1.7	3.5	0.0
19466	424660	23	2.3	4.3	0.1
19465	424658	23	0.0	0.2	0.0
19453	424642	23	1.0	2.4	0.0
19457	424648	23	1.1	4.2	0.0
19454	424645	23	0.4	2.0	0.0

- Classification
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1. Frequency-Positive Fidelity Index
(Menu Analysis > Matching to WHITE Relevés)
2. ASSOCIA (Normalised Likelihood)
(Menu Analysis > Matching to WHITE Relevés)

Constancy columns as randomly generated relevés in a virtual relevé table

Advantages

		20
Sp1	0	100
Sp2	0	95
Sp3	0	90
Sp4	0	85
Sp5	0	80
Sp6	0	75
Sp7	0	70
Sp8	0	65
Sp9	0	60
Sp10	0	55
Sp11	0	50
Sp12	0	45
Sp13	0	40
Sp14	0	35
Sp15	0	30
Sp16	0	25
Sp17	0	20
Sp18	0	15
Sp19	0	10
Sp20	0	5

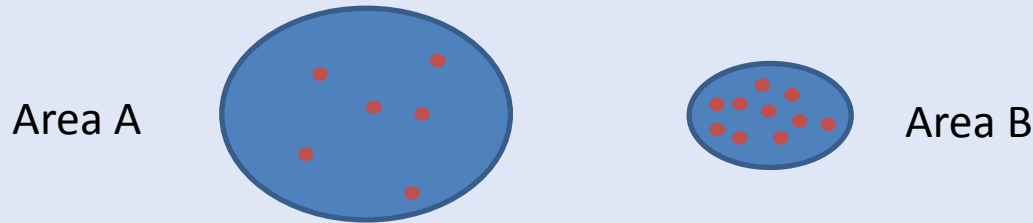
Initial entry number:

Relevés 20		11111111112
Species 20		12345678901234567890
Sp1	0	11111111111111111111
Sp2	0	111111111111111111.11
Sp3	0	11111.11.111111111111
Sp4	0	.11.11111.11111111111
Sp5	0	11111111.111111.1.1
Sp6	0	.1.1.1.1111111111.111
Sp7	0	11..1.111.1111111.1.
Sp8	0	.11.1.111.111.1.1.11
Sp9	0	11.1..1..1.11.111111.
Sp10	0	..1.11..11111..111..
Sp11	0	.11..111.111...11.
Sp12	0	11.1..1.1...11..1.1.
Sp13	0	.11.1.1..11...11.
Sp14	0	.....111...1.1.1.1.
Sp15	0	1...1.111.....1
Sp16	0	..1...11...11..
Sp17	0	1...1.1.....1..
Sp18	0	.....1.1.....1....
Sp19	0	1.....1.....
Sp20	0	...1.....

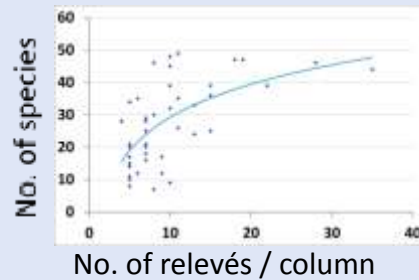
- Constancy columns are weighted by the number of relevés
- Constancy columns may be 'stratified'
- Constancy tables can be combined with existing relevés
- Each constancy column can be simply replaced by real relevés in the table
- Better fidelity estimation

Constancy columns: possible problems

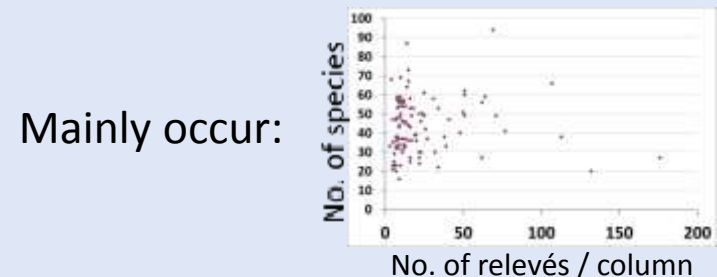
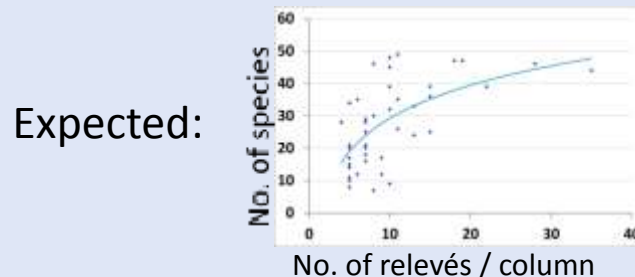
1. Constancy columns from different sources may contain the same relevés
2. Some regions may be oversampled.



3. Incomparable columns with different number of relevés



4. Incomplete list of species in some published constancy columns.
(Rare species are not included)



Thank you for your attention!