Spatial assignment of test sample

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Contents

Input .................................................. 1
  Isotope values of test sample .......................... 1
Output ................................................. 1
  Model .................................................. 1
  Map of best fitted reference sample ...................... 2
  Best fitted reference entries .......................... 3
  Testing robustness of assignment: Wilcoxon signed rank test .......... 3
    P-values for the k nearest neighbours in Wilcoxon Test ............. 3
    Goodness of fit of test sample: ................................ 3

Input

Website Identifier: 28

Isotope values of test sample

Table 1: Isotope values of test sample

<table>
<thead>
<tr>
<th>13C/12C</th>
<th>15N/14N</th>
<th>18O/16O</th>
<th>2H/1H</th>
<th>34S/32S</th>
</tr>
</thead>
<tbody>
<tr>
<td>-21.7</td>
<td>4.9</td>
<td>18.8</td>
<td>-43.1</td>
<td>5.9</td>
</tr>
</tbody>
</table>

Output

Model

##
## Call:
## train.kknn(formula = fmla, data = ivory.train, kmax = 15, distance = 2, kernel = knl)
##
## Type of response variable: nominal
## Minimal misclassification: 0.3765867
## Best kernel: triangular
## Best k: 15

Classifier: country_code
Map of best fitted reference sample

Best fitted reference sample:

- Site: Burkina Faso, Yeryanga Safari Concession
- Country: BF
- Region: West Africa
- CITES: Appendix I
- Lat: 12.4
- Lon: -1.33
Assignment of test sample to nearest neighbours

Best fitted reference entries

Table 2: Details of best fitted reference entry (row 1) and other fitted entries within best classifier

<table>
<thead>
<tr>
<th>lon</th>
<th>lat</th>
<th>location</th>
<th>13C/12C</th>
<th>15N/14N</th>
<th>18O/16O</th>
<th>2H/1H</th>
<th>34S/32S</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1.33</td>
<td>12.40</td>
<td>Burkina Faso, Velryanga Safari Concession</td>
<td>-21.1</td>
<td>5.6</td>
<td>18.4</td>
<td>-49.2</td>
<td>8.1</td>
</tr>
<tr>
<td>-1.48</td>
<td>11.08</td>
<td>Burkina Faso, Ranch de Nazinga</td>
<td>-22.1</td>
<td>5.1</td>
<td>18.4</td>
<td>-41.1</td>
<td>10.0</td>
</tr>
<tr>
<td>-1.33</td>
<td>12.40</td>
<td>Burkina Faso, Velryanga Safari Concession</td>
<td>-21.8</td>
<td>6.2</td>
<td>17.0</td>
<td>-49.8</td>
<td>7.1</td>
</tr>
<tr>
<td>-1.48</td>
<td>11.08</td>
<td>Burkina Faso, Ranch de Nazinga</td>
<td>-21.4</td>
<td>5.7</td>
<td>18.1</td>
<td>-45.8</td>
<td>10.1</td>
</tr>
</tbody>
</table>

Country of prediction: BF

Testing robustness of assignment: Wilcoxon signed rank test

If p-value > 0.05, the test concludes that the isotope signature of the test sample is similar to the respective nearest neighbour reference sample.

P-values for the k nearest neighbours in Wilcoxon Test

“0.000000103, 0.0000000026, 0.0000000026, 0.0000000026”

Goodness of fit of test sample:

• good fit: if p > 0.05 for at least two tested nearest neighbour reference samples;
• moderate fit: if $p > 0.05$ for at least one tested nearest neighbour reference samples;
• uncertain: if $p > 0.05$ for none of the tested nearest neighbour reference samples.

Assumption: At least two nearest reference samples are available.

Overall goodness of fit of test sample: “uncertain”