Spatial assignment of test sample

November 24, 2016

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Input
Website Identifier: Blind 16_CD

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>-24.2</td>
<td>11.1</td>
<td>16.3</td>
<td>-28.1</td>
<td>4.1</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

1
Map of best fitted reference sample

Best fitted reference sample:

- Country: CD
- Region: Central Africa
- CITES: Appendix I
- Lat: 3.4
- Lon: 29.09
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>29.09</td>
<td>3.40</td>
<td>Dem. Rep. Congo, Gangala na Bodio</td>
<td>-24.4</td>
<td>11.7</td>
<td>17.6</td>
<td>-29.7</td>
<td>3.9</td>
</tr>
<tr>
<td>29.29</td>
<td>0.29</td>
<td>Dem. Rep. Congo, Beni</td>
<td>-24.7</td>
<td>11.4</td>
<td>17.1</td>
<td>-37.3</td>
<td>5.3</td>
</tr>
<tr>
<td>27.20</td>
<td>-2.40</td>
<td>Dem. Rep. Congo, Shabunda terr</td>
<td>-22.5</td>
<td>10.3</td>
<td>17.3</td>
<td>-29.5</td>
<td>3.4</td>
</tr>
<tr>
<td>29.29</td>
<td>0.29</td>
<td>Dem. Rep. Congo, Beni terr</td>
<td>-24.1</td>
<td>10.2</td>
<td>18.2</td>
<td>-22.7</td>
<td>5.3</td>
</tr>
<tr>
<td>27.20</td>
<td>-2.42</td>
<td>Dem. Rep. Congo, Bakisi</td>
<td>-22.4</td>
<td>10.9</td>
<td>16.3</td>
<td>-35.5</td>
<td>2.2</td>
</tr>
<tr>
<td>27.18</td>
<td>2.25</td>
<td>Dem. Rep. Congo, Medje</td>
<td>-24.2</td>
<td>11.9</td>
<td>17.4</td>
<td>-37.8</td>
<td>6.8</td>
</tr>
</tbody>
</table>

Country of prediction: CD
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

“0.88047764, 0.47730701, 0.27029878, 0.03674213, 0.00506248, 0.00267555, 0.00133831, 0.00062930, 0.00034126, 0.00008731, 0.00003100, 0.00000701, 0.00000503, 0.00000049”

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: “good fit”