Spatial assignment of test sample

December 09, 2016

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Input

Website Identifier: 005p562-32

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>-25.3</td>
<td>10.9</td>
<td>13.7</td>
<td>-52.6</td>
<td>12.8</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: Congo, Shot in Southern Congo, on the Atlantic shore very near the border with Gabon
- Country: CG
- Region: Central Africa
- CITES: Appendix I
- Lat: -3.78
- Lon: 11.27
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>11.27</td>
<td>-3.78</td>
<td>Congo, Shot in Southern Congo, on the At</td>
<td>-24.7</td>
<td>11.6</td>
<td>15.8</td>
<td>-48.1</td>
<td>11.0</td>
</tr>
<tr>
<td>11.64</td>
<td>-4.13</td>
<td>Congo, Shot in Southern Congo, 50km from</td>
<td>-25.0</td>
<td>8.5</td>
<td>14.7</td>
<td>-49.4</td>
<td>11.9</td>
</tr>
<tr>
<td>12.79</td>
<td>-3.01</td>
<td>Congo, Litsandou village, 8km southeast</td>
<td>-23.5</td>
<td>10.2</td>
<td>13.3</td>
<td>-64.6</td>
<td>10.8</td>
</tr>
<tr>
<td>20.96</td>
<td>-1.44</td>
<td>Congo</td>
<td>-23.7</td>
<td>9.2</td>
<td>13.6</td>
<td>-62.2</td>
<td>9.8</td>
</tr>
<tr>
<td>13.54</td>
<td>-2.82</td>
<td>Congo, Shot in Central Congo near Sibiti</td>
<td>-24.1</td>
<td>7.2</td>
<td>13.5</td>
<td>-52.2</td>
<td>12.8</td>
</tr>
</tbody>
</table>

Country of prediction: CG

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

“0.1583, 0.0459, 0.0079, 0.0059, 0.0023”
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: “**moderate fit**”