Spatial assignment of test sample

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Input

Website Identifier: 005p562-4

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>-26.8</td>
<td>10.4</td>
<td>13.5</td>
<td>-49</td>
<td>12</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: 0.1889986
## Best kernel: triangular
## Best k: 14
Classifier: region
Map of best fitted reference sample

Best fitted reference sample:

- Site: Gabon
- Country: GA
- Region: Central Africa
- CITES: Appendix I
- Lat: -1.184233
- Lon: 12.756053
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>12.76</td>
<td>-1.18</td>
<td>Gabon</td>
<td>-26.6</td>
<td>10.0</td>
<td>15.0</td>
<td>-56.9</td>
<td>9.9</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>11.15</td>
<td>2.86</td>
<td>Cameroon, near Ebolowa</td>
<td>-25.0</td>
<td>11.7</td>
<td>15.0</td>
<td>-52.0</td>
<td>10.1</td>
</tr>
<tr>
<td>12.76</td>
<td>-1.18</td>
<td>Gabon</td>
<td>-26.6</td>
<td>10.4</td>
<td>14.9</td>
<td>-57.1</td>
<td>8.2</td>
</tr>
<tr>
<td>14.47</td>
<td>-0.01</td>
<td>Dem. Rep. Congo</td>
<td>-25.0</td>
<td>10.2</td>
<td>15.8</td>
<td>-49.9</td>
<td>10.1</td>
</tr>
<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>17.11</td>
<td>-1.10</td>
<td>Dem. Rep. Congo, Lukolela</td>
<td>-24.8</td>
<td>10.5</td>
<td>15.4</td>
<td>-43.4</td>
<td>8.4</td>
</tr>
<tr>
<td>14.57</td>
<td>-0.08</td>
<td>Dem. Rep. Congo</td>
<td>-24.9</td>
<td>10.3</td>
<td>16.4</td>
<td>-49.5</td>
<td>10.0</td>
</tr>
<tr>
<td>10.20</td>
<td>3.13</td>
<td>Cameroon, Lokundji</td>
<td>-26.7</td>
<td>11.1</td>
<td>15.5</td>
<td>-51.6</td>
<td>6.8</td>
</tr>
<tr>
<td>9.97</td>
<td>3.07</td>
<td>Cameroon, Longji</td>
<td>-25.8</td>
<td>8.2</td>
<td>14.6</td>
<td>-51.9</td>
<td>7.3</td>
</tr>
<tr>
<td>12.47</td>
<td>4.98</td>
<td>Cameroon</td>
<td>-25.0</td>
<td>7.7</td>
<td>14.9</td>
<td>-50.6</td>
<td>9.5</td>
</tr>
<tr>
<td>9.48</td>
<td>-1.90</td>
<td>Gabon, a few kilometers from the lower e</td>
<td>-25.3</td>
<td>8.4</td>
<td>13.6</td>
<td>-53.7</td>
<td>6.3</td>
</tr>
</tbody>
</table>

Region of prediction: Central Africa

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

“0.9809717, 0.0018749, 0.0006612, 0.0002010, 0.0000902, 0.0000678, 0.0000678, 0.0000678, 0.0000030,
0.0000019, 0.0000019, 0.0000007, 0.0000001”

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”