Spatial assignment of test sample

November 24, 2016

Contents

Input

Website Identifier: 095-T

Isotope values of test sample

Table 1: Isotope values of test sample

13C/12C	15N/14N	18O/16O	2H/1H	34S/32S
-21.7	10.8	18	-25.7	10.5

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
```
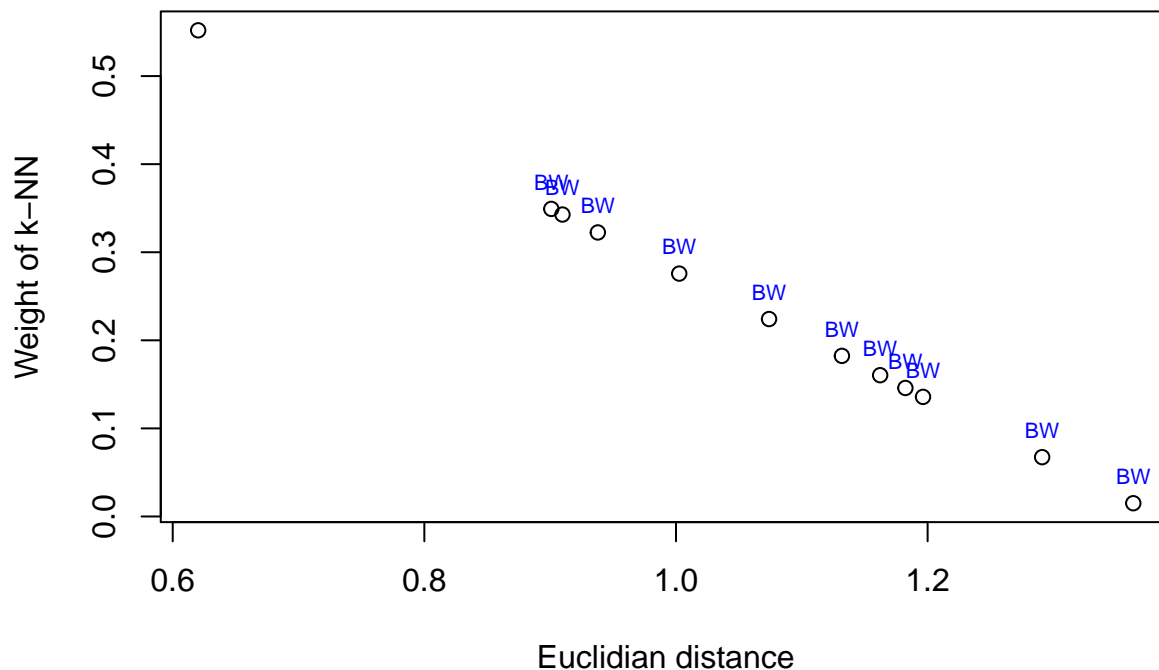
Classifier: **country_code**

Map of best fitted reference sample
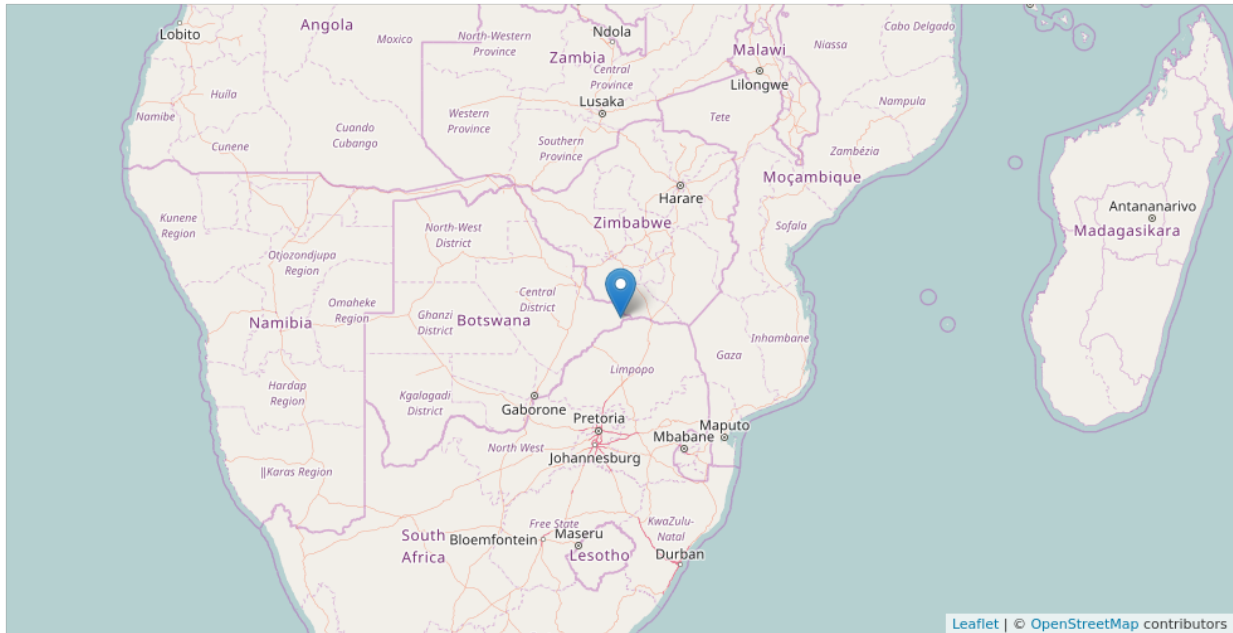
Best fitted reference sample:

- Site: Botswana, Mathathane area
- Country: BW
- Region: Southern Africa
- CITES: Appendix II
- Lat: -22.2
- Lon: 28.91

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

lon	lat	location	13C/12C	15N/14N	18O/16O	2H/1H	34S/32S
28.91	-22.20	Botswana, Mathathane area	-21.7	10.6	18.2	-24.0	8.5
28.91	-22.20	Botswana, Mathathane area	-21.6	10.5	16.9	-33.2	10.5
27.73	-21.89	Botswana, Mmadinare area	-21.1	10.3	17.1	-27.2	12.8
27.73	-21.89	Botswana, Mmadinare area	-21.4	10.2	17.1	-27.7	8.0
28.91	-22.20	Botswana, Mathathane area	-21.8	9.3	17.9	-32.1	9.6
27.57	-21.65	Botswana, Francistown area	-21.0	9.7	16.9	-32.5	10.1
28.91	-22.20	Botswana, Mathathane area	-19.9	11.6	18.9	-27.9	10.7
28.91	-22.20	Botswana, Mathathane area	-20.4	10.3	18.7	-34.6	11.0
28.91	-22.20	Botswana, Mathathane area	-19.9	10.9	17.5	-29.9	12.4
25.13	-17.84	Botswana, Kasane/Chobe area	-21.8	10.2	18.7	-36.8	11.8
28.42	-22.00	Botswana, Bobonong area	-22.0	9.6	17.2	-34.2	12.9
27.73	-21.87	Botswana, Mmadinare area	-21.2	9.9	16.3	-33.8	8.6

Country of prediction: BW

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

"0.171789, 0.145619, 0.093216, 0.005890, 0.003704, 0.002676, 0.001600, 0.000516, 0.000341, 0.000177, 0.000177, 0.000087"

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**"