Spatial assignment of test sample

November 24, 2016

Contents

Input

Website Identifier: 048-R

Isotope values of test sample

Table 1: Isotope values of test sample

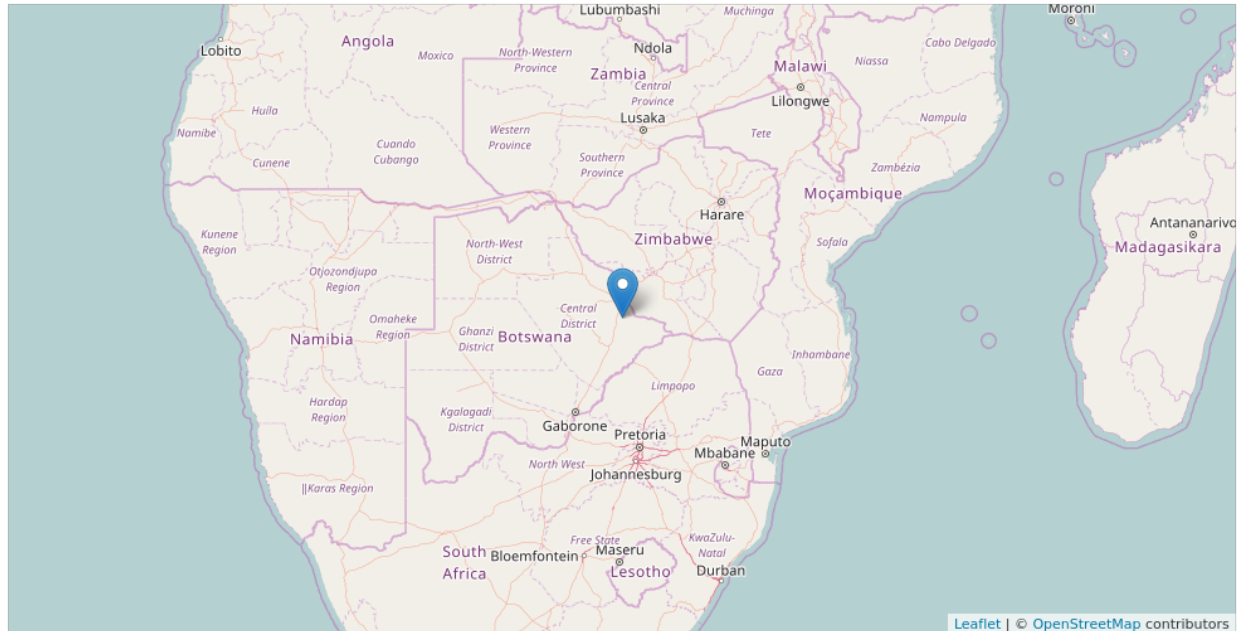| 13C/12C	15N/14N	18O/16O	2H/1H	34S/32S
-21.4	12.1	20.2	-17.4	12.6

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
```
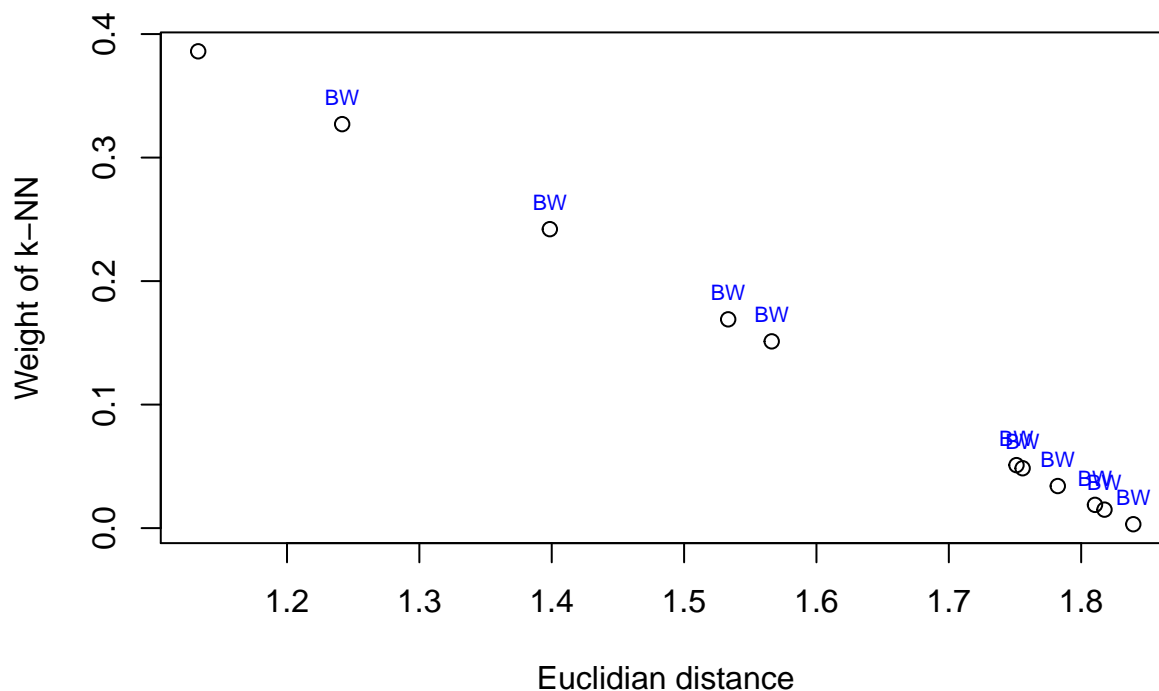
Classifier: **country_code**

Map of best fitted reference sample

Best fitted reference sample:

- Site: Botswana, Francistown area
- Country: BW
- Region: Southern Africa
- CITES: Appendix II
- Lat: -21.65
- Lon: 27.57

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
27.57	-21.65	Botswana, Francistown area	-20.6	11.8	21.5	-20.8	15.2
23.34	-19.80	Botswana, Maun area	-20.3	11.2	20.6	-21.6	15.7
25.81	-24.72	Botswana, Gaborone	-20.6	11.2	20.0	-27.0	15.6
28.91	-22.20	Botswana, Mathathane area	-19.9	11.6	18.9	-27.9	10.7
23.34	-19.80	Botswana, Maun area	-20.8	10.3	19.7	-29.1	14.4
27.57	-21.65	Botswana, Francistown area	-20.7	12.2	20.4	-30.5	16.7
28.91	-22.20	Botswana, Mathathane area	-18.6	11.8	18.4	-16.4	11.3
23.34	-19.80	Botswana, Maun area	-19.5	11.5	19.2	-31.7	11.6
23.34	-19.80	Botswana, Maun area	-18.9	11.6	20.0	-30.6	12.6
23.34	-19.80	Botswana, Maun area	-20.7	10.9	19.5	-34.4	14.0
28.91	-22.20	Botswana, Mathathane area	-21.7	10.6	18.2	-24.0	8.5

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

"0.020249885, 0.006833116, 0.001338314, 0.000111219, 0.000001728, 0.000000309, 0.000000181, 0.000000103, 0.000000026, 0.000000026, 0.000000026"

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**"