

Spatial assignment of test sample

December 14, 2016

Contents

Input	1
Isotope values of test sample	1
Output	1
Model	1
Map of best fitted reference sample	2
Best fitted reference entries	3
Testing robustness of assignment: Wilcoxon signed rank test	3
P-values for the k nearest neighbours in Wilcoxon Test	3
Goodness of fit of test sample:	4

Input

Website Identifier: 189

Isotope values of test sample

Table 1: Isotope values of test sample

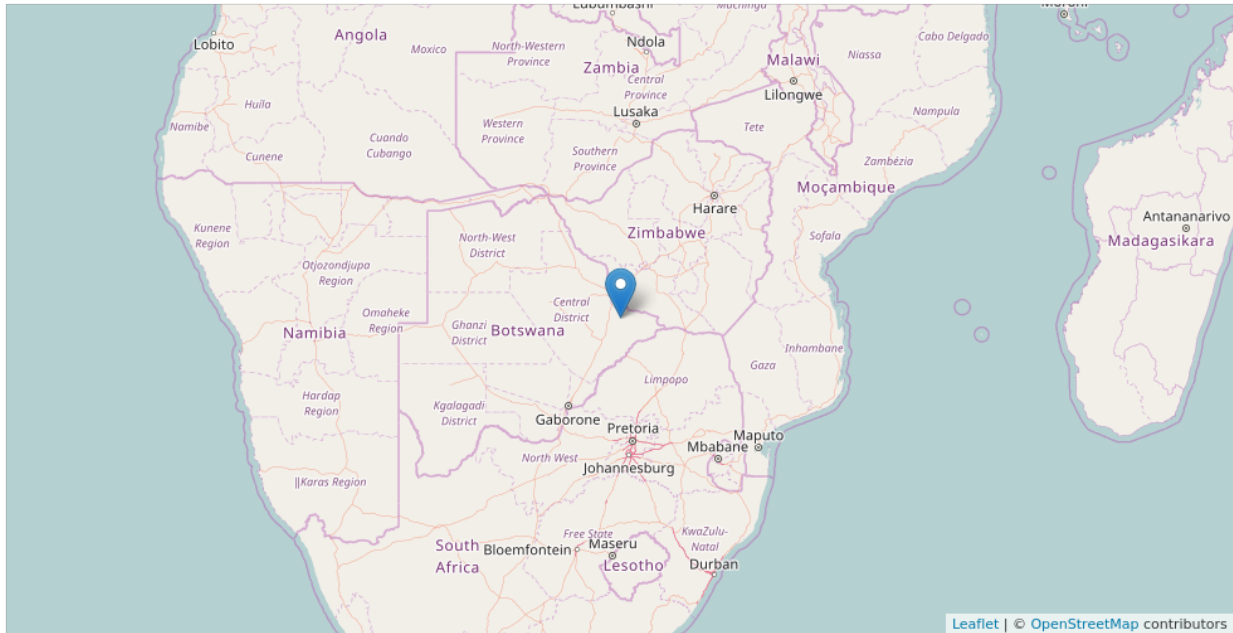
13C/12C	15N/14N	18O/16O	2H/1H	34S/32S
-22.5	10.1	15.3	-27.6	9.2

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
```

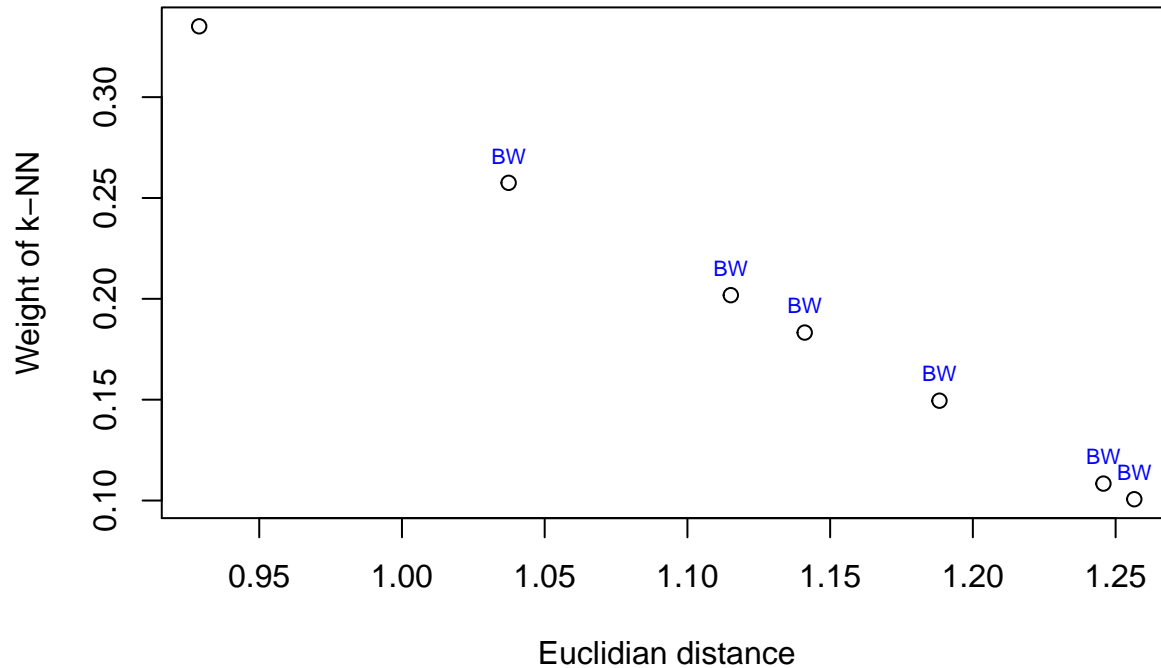
Map of best fitted reference sample



Best fitted reference sample:

- Site: Botswana, Mmadinare area
- Country: BW
- Region: Southern Africa
- CITES: Appendix II
- Lat: -21.87
- Lon: 27.73

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
27.73	-21.87	Botswana, Mmadinare area	-21.4	9.3	14.8	-26.8	7.3
27.73	-21.87	Botswana, Mmadinare area	-21.2	9.9	16.3	-33.8	8.6
27.73	-21.89	Botswana, Mmadinare area	-21.4	10.2	17.1	-27.7	8.0
28.91	-22.20	Botswana, Mathathane area	-21.6	10.5	16.9	-33.2	10.5
27.73	-21.87	Botswana, Mmadinare area	-20.7	9.7	15.6	-32.0	7.3
27.57	-21.65	Botswana, Francistown area	-21.0	9.7	16.9	-32.5	10.1
28.42	-22.00	Botswana, Bobonong area	-22.0	9.6	16.3	-34.7	12.2

Country of prediction: BW

Testing robustness of assignment: Wilcoxon signed rank test

If $p\text{-value} > 0.05$, 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

“0.1583094, 0.0696586, 0.0037044, 0.0001771, 0.0000176, 0.0000050, 0.0000017”

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**”