Spatial assignment of test sample

November 24, 2016

Contents

Input

Website Identifier: T2_18cm

Isotope values of test sample

Table 1: Isotope values of test sample

13C/12C	15N/14N	18O/16O	2H/1H	34S/32S
-19.9	5.9	18.5	-50.1	9

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
```
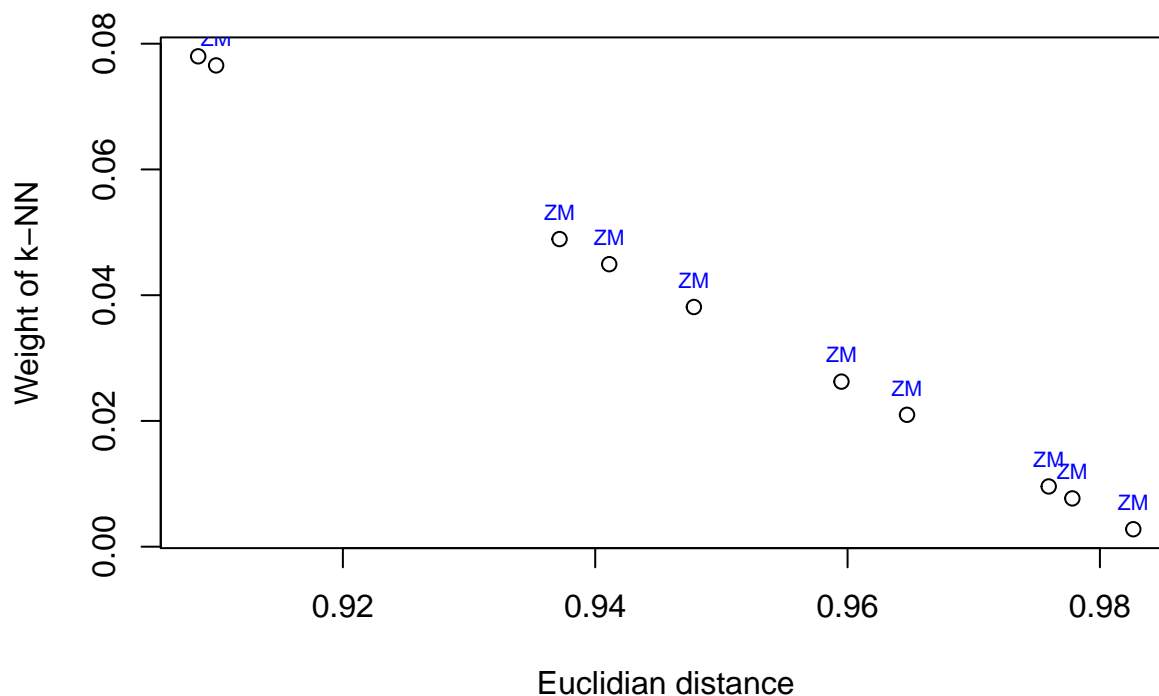
Classifier: **country_code**

Map of best fitted reference sample
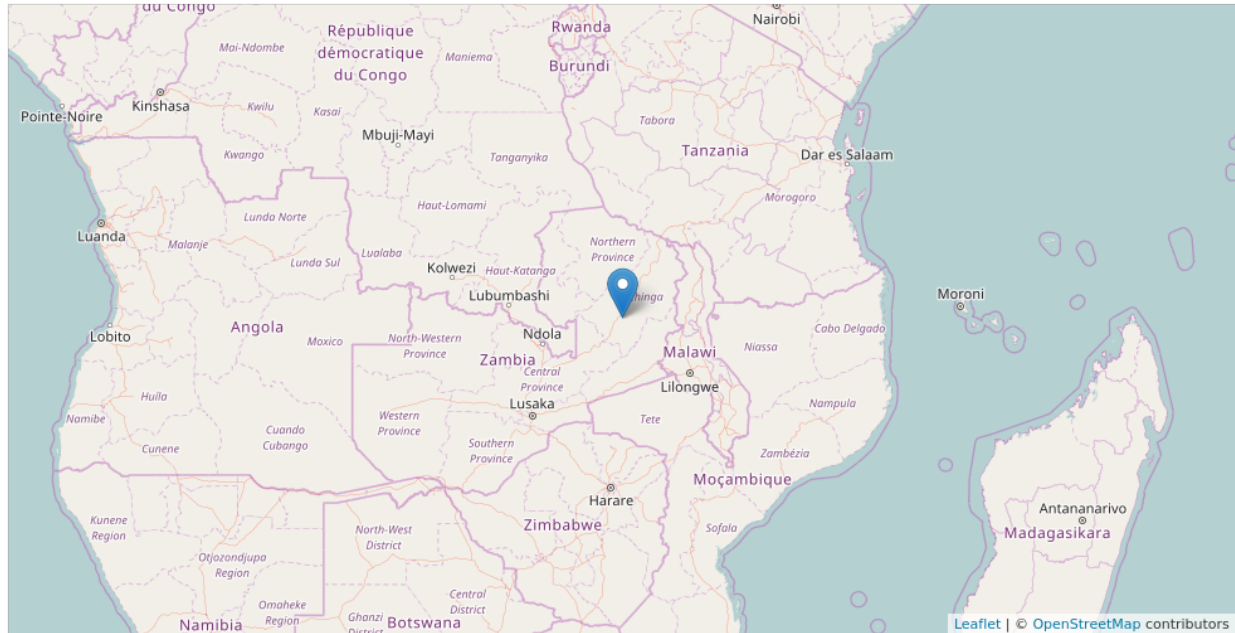
Best fitted reference sample:

- Site: Northeastern Zambia, near Chilonga
- Country: ZM
- Region: Southern Africa
- CITES: Appendix I
- Lat: -12.12
- Lon: 31.44

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
31.44	-12.12	Northeastern Zambia, near Chilonga	-20.9	6.9	18.7	-53.0	7.4
25.88	-16.09	Southern Zambia	-21.0	6.4	18.1	-56.6	9.6
25.96	-14.97	Southern Zambia	-20.6	7.1	19.6	-51.9	8.2
25.68	-16.76	Southern Zambia	-20.7	6.4	18.0	-57.7	10.0
32.30	-11.37	Southern Zambia	-20.8	7.3	18.6	-54.2	9.6
25.45	-16.52	Southern Zambia	-21.3	7.1	18.8	-49.7	8.9
32.19	-11.41	Southern Zambia	-20.6	7.2	18.4	-46.4	7.3
32.10	-12.05	Southern Zambia	-19.6	7.3	18.3	-45.3	7.4
25.88	-16.09	Southern Zambia	-20.8	6.5	17.8	-56.3	10.5
32.38	-11.29	North Zambia, near Msitu	-20.7	7.0	18.2	-44.8	10.6

Country of prediction: ZM

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

"0.001338314, 0.000515506, 0.000221484, 0.000040640, 0.000013100, 0.000009619, 0.000005028, 0.000001160, 0.000001160, 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**"