

# Spatial assignment of test sample

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## Contents

<b>Input</b>	<b>1</b>
Isotope values of test sample . . . . .	1
<b>Output</b>	<b>1</b>
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 . . . . .	4
Goodness of fit of test sample: . . . . .	4

## Input

Website Identifier:

### Isotope values of test sample

Table 1: Isotope values of test sample

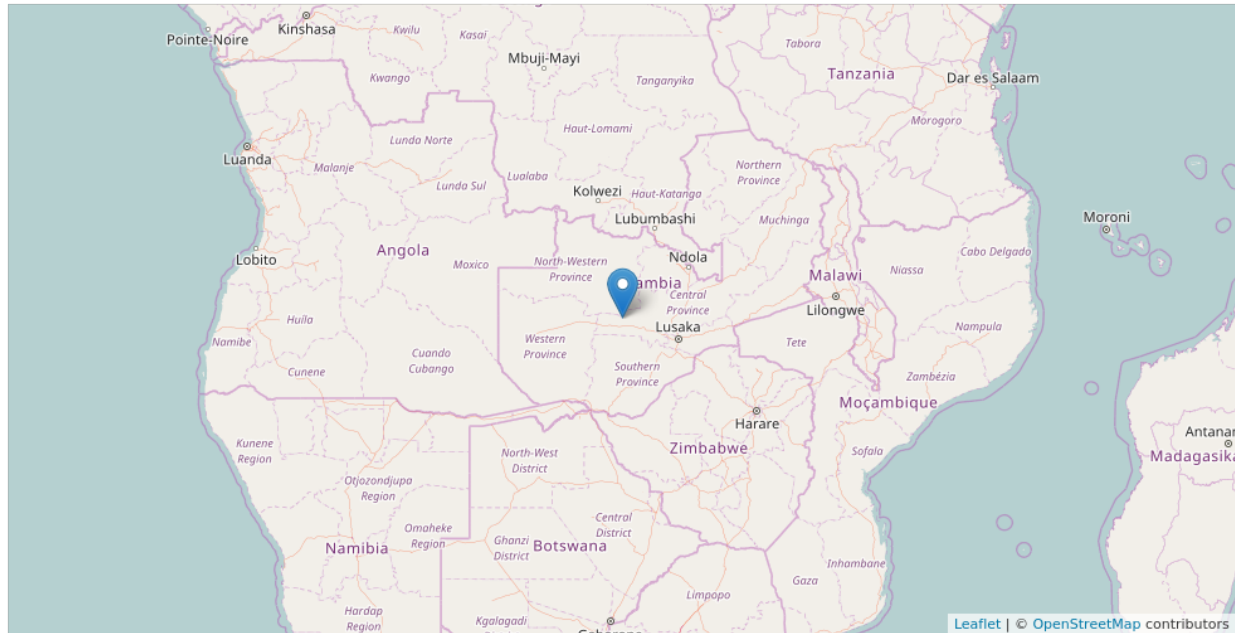
13C/12C	15N/14N	18O/16O	2H/1H	34S/32S
-23.9	7.7	19.3	-51.6	5.9

## 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
```

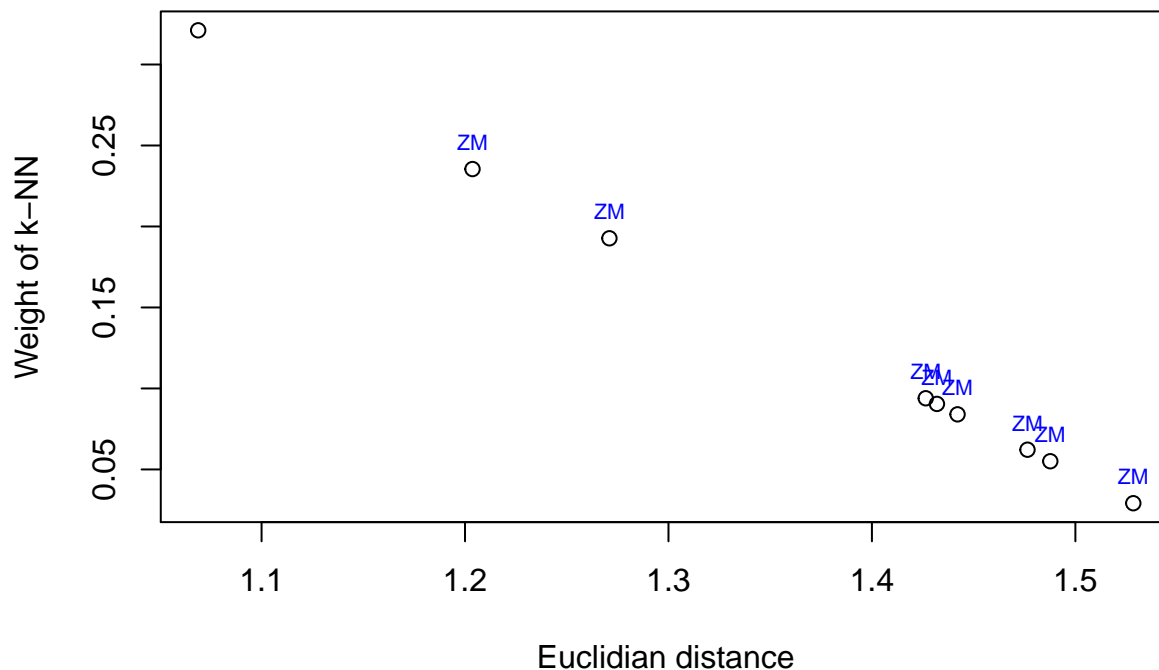
## Map of best fitted reference sample



### Best fitted reference sample:

- Site: Southern Zambia
- Country: ZM
- Region: Southern Africa
- CITES: Appendix I
- Lat: -14.734547
- Lon: 26.330943

## 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
26.33	-14.73	Southern Zambia	-23.1	7.0	18.8	-53.1	8.9
25.70	-16.73	Southern Zambia	-22.5	7.6	18.4	-50.8	8.8
26.71	-14.96	South Zambia, East of Kafue National Par	-21.9	7.7	18.6	-50.8	8.1
26.21	-14.38	Southern Zambia	-23.0	7.9	18.2	-43.4	9.2
32.30	-11.10	North Zambia, near Chibesakunda	-22.1	6.7	17.6	-56.4	6.3
31.59	-12.32	East Zambia, North of South Luangwa Nati	-21.7	6.8	19.5	-47.5	8.1
25.70	-16.73	Southern Zambia	-22.1	8.0	18.0	-51.8	9.1
32.55	-12.22	East Zambia, east to North Luangwa Natio	-21.3	7.5	18.4	-52.9	7.3
25.60	-16.26	Southern Zambia	-22.9	5.8	18.9	-50.8	9.5

Country of prediction: ZM

### 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

“0.000005070, 0.000005070, 0.000000052, 0.000000026, 0.000000026, 0.000000026, 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**”