

# Spatial assignment of test sample

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## Input

Website Identifier:

### Isotope values of test sample

Table 1: Isotope values of test sample

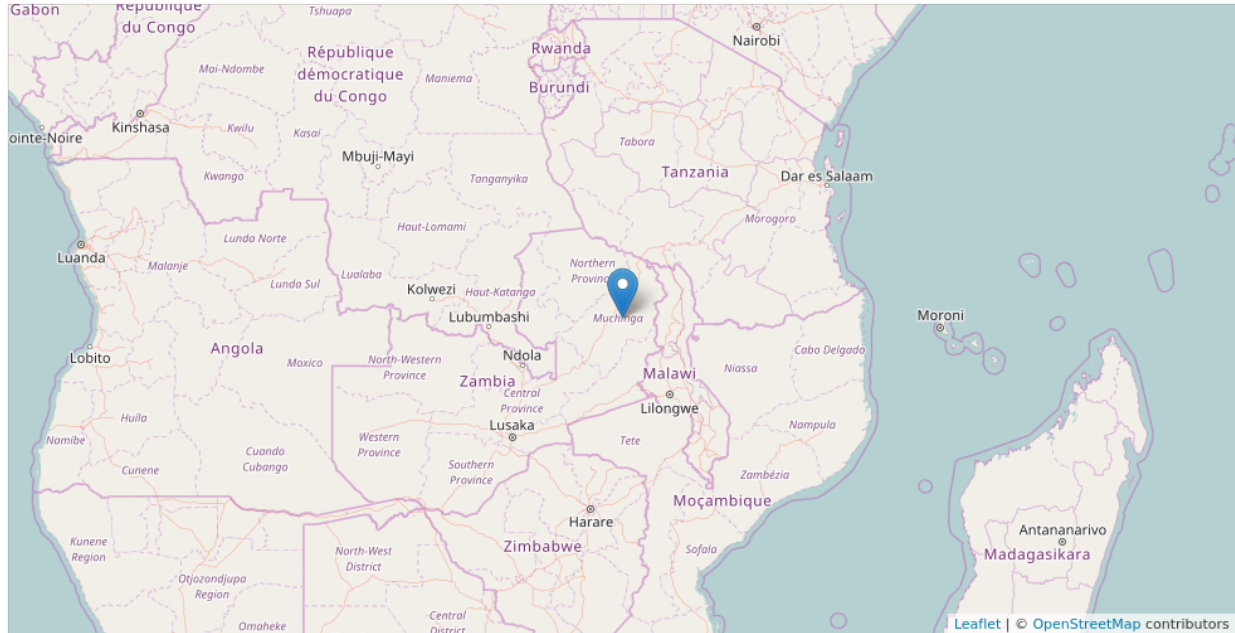
13C/12C	15N/14N	18O/16O	2H/1H	34S/32S
-20.4	8.6	18.3	-53.3	2.7

## 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
```

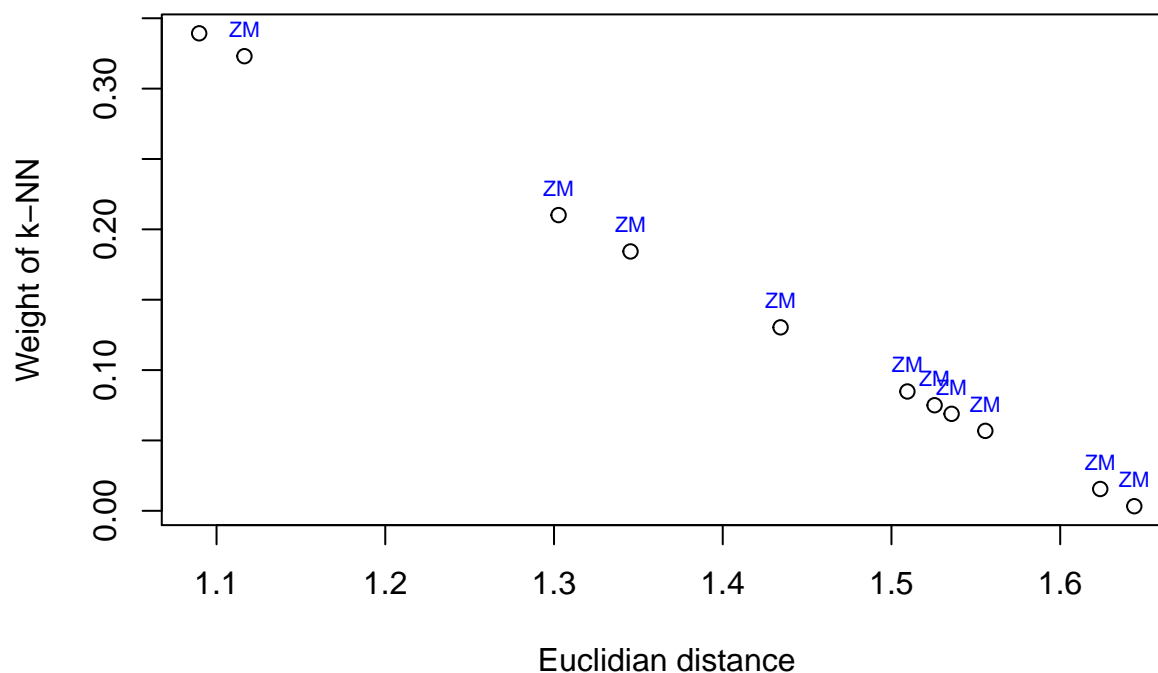
## Map of best fitted reference sample



### Best fitted reference sample:

- Site: Southern Zambia
- Country: ZM
- Region: Southern Africa
- CITES: Appendix I
- Lat: -11.40573
- Lon: 32.13137

## 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
32.13	-11.41	Southern Zambia	-20.8	9.1	18.4	-49.1	6.0
25.95	-16.27	Southern Zambia	-19.4	8.4	17.9	-52.7	6.0
32.04	-12.05	Southern Zambia	-20.0	8.2	18.5	-48.8	6.8
32.11	-11.52	Southern Zambia	-21.2	6.1	18.3	-53.4	3.4
31.40	-12.24	Southern Zambia	-19.9	8.0	18.5	-48.0	7.1
32.08	-11.40	Southern Zambia	-19.5	8.2	17.2	-57.5	7.0
32.55	-12.22	East Zambia, east to North Luangwa Natio	-21.3	7.5	18.4	-52.9	7.3
31.79	-12.42	Southern Zambia	-20.1	8.0	18.5	-41.9	6.3
32.11	-11.52	Southern Zambia	-21.4	5.9	17.5	-57.2	2.7
32.09	-11.48	Southern Zambia	-19.9	7.2	17.8	-57.2	7.4
32.09	-11.48	Southern Zambia	-21.8	6.0	18.4	-46.6	1.9

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

“0.590744927, 0.477307012, 0.002262130, 0.000000103, 0.000000026, 0.000000026, 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: “**good fit**”