

# Spatial assignment of test sample

December 14, 2016

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## Input

Website Identifier: 112

### Isotope values of test sample

Table 1: Isotope values of test sample

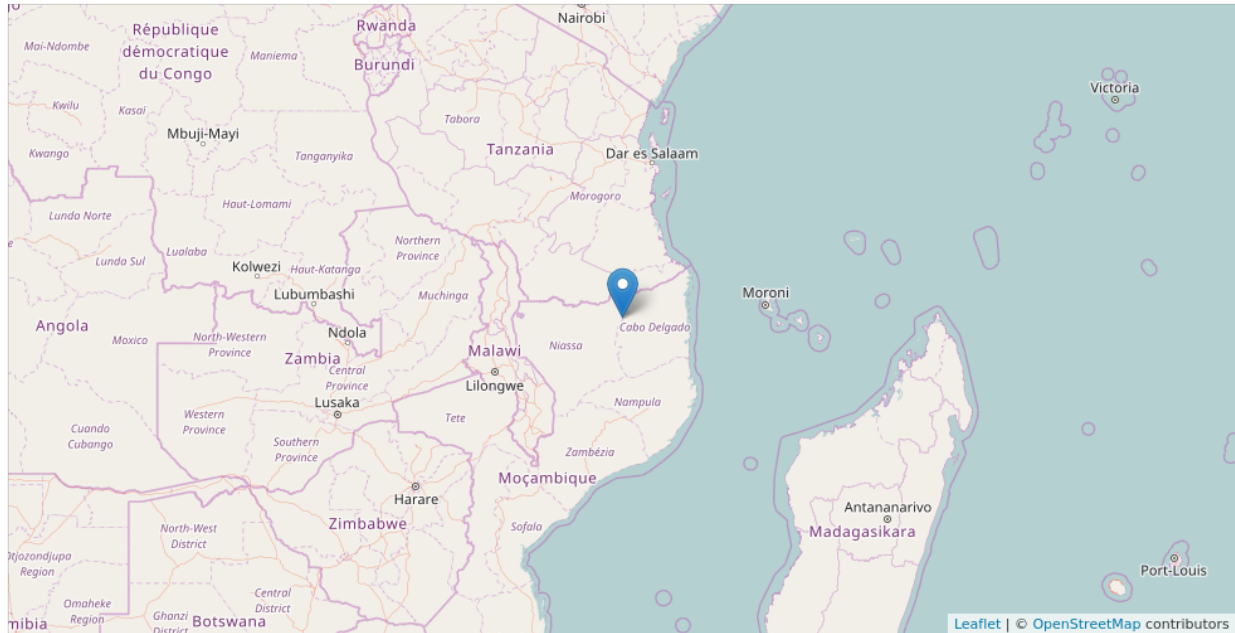
13C/12C	15N/14N	18O/16O	2H/1H	34S/32S
-22.5	7.9	14.8	-34.5	11.9

## 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
```

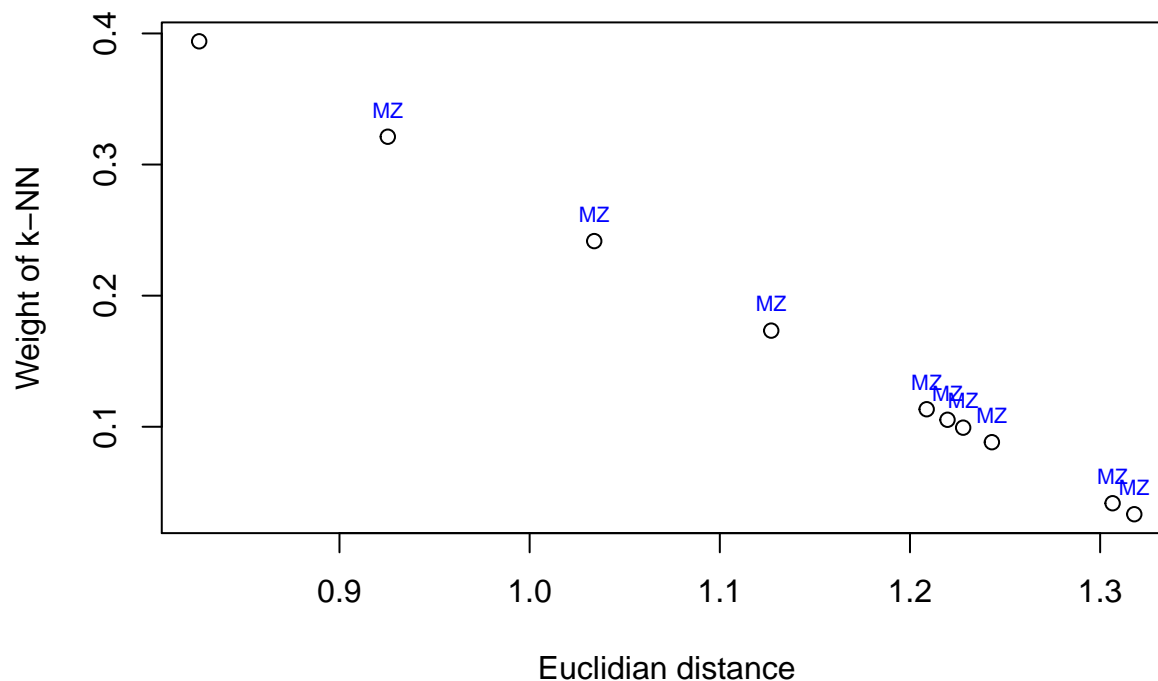
## Map of best fitted reference sample



### Best fitted reference sample:

- Site: Mozambique, Lugenda south bank (block C)
- Country: MZ
- Region: Southern Africa
- CITES: Appendix I
- Lat: -12.18
- Lon: 38.22

## 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
38.22	-12.18	Mozambique, Lugenda south bank (block C)	-22.0	7.8	15.5	-39.5	10.1
37.84	-12.00	Mozambique, Kambako (block L8) area	-23.4	8.1	15.2	-35.8	9.3
36.86	-11.90	Mozambique, Chipuputa area (block L5)	-21.7	7.0	15.9	-39.0	10.3
38.52	-12.00	Mozambique, Kambako (block L8) - Salt Sp	-21.9	9.0	13.7	-38.2	9.6
37.85	-11.32	Mozambique, Chipupa / Rovuma	-22.0	6.9	16.7	-37.7	10.5
38.52	-12.00	Mozambique, Kambako block - L8	-23.4	8.7	16.6	-35.4	10.0
38.42	-11.55	Mozambique, Lugenda north bank - Chipopu	-22.5	6.9	15.7	-35.8	8.4
32.10	-14.70	Mozambique, Kambako block - L8	-21.5	7.1	16.2	-42.3	10.8
37.84	-12.30	Mozambique, Block L7 - Lugenda south ban	-22.0	7.5	15.5	-41.6	8.4
38.51	-12.00	Mozambique, Kambako block - L8	-23.5	8.6	16.5	-30.4	9.5

Country of prediction: MZ

### 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

“0.94862324, 0.12252401, 0.09321572, 0.02292252, 0.00027569, 0.00000250, 0.00000173, 0.00000049, 0.00000031, 0.00000018”

### 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**”