

# Spatial assignment of test sample

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## Input

Website Identifier: 106

## Isotope values of test sample

Table 1: Isotope values of test sample

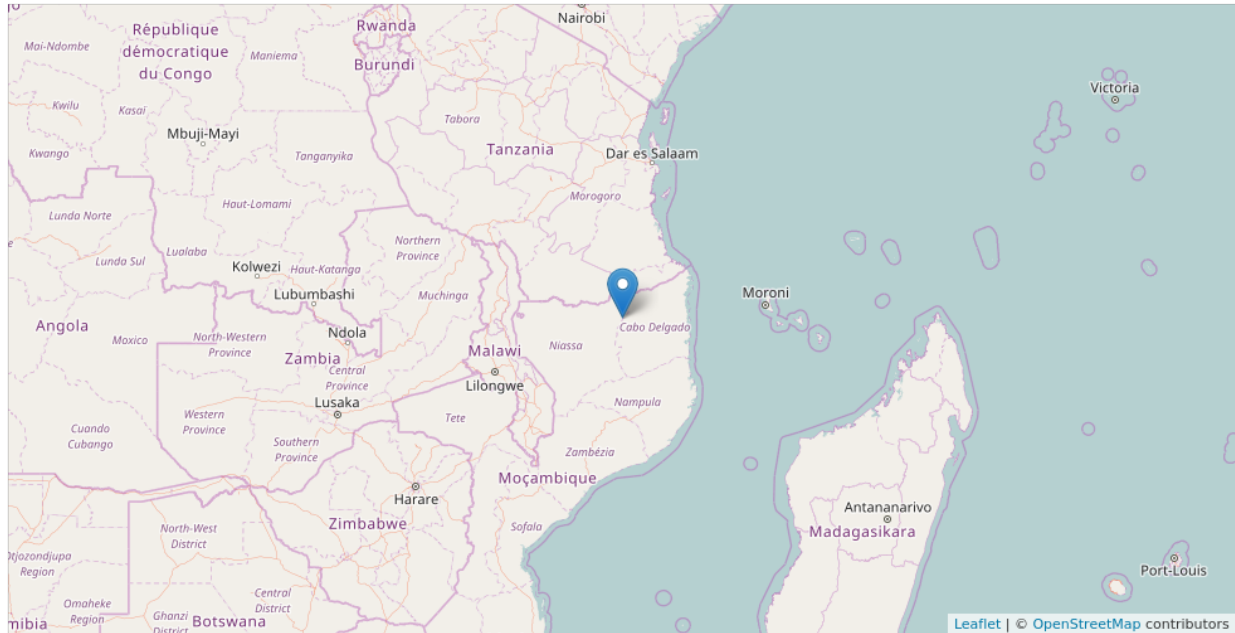
13C/12C	15N/14N	18O/16O	2H/1H	34S/32S
-22.1	6.9	14.6	-44.4	11

## 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
```

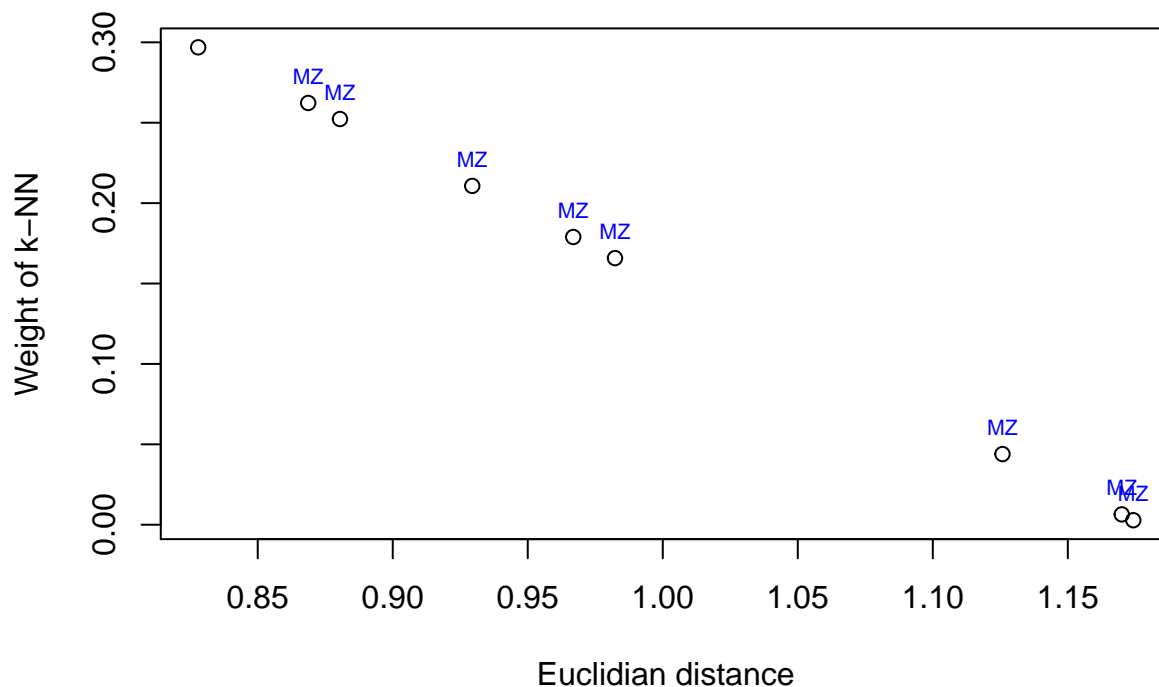
## Map of best fitted reference sample



### 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
36.86	-11.90	Mozambique, Chipuputa area (block L5)	-21.7	7.0	15.9	-39.0	10.3
32.10	-14.70	Mozambique, Kambako block - L8	-21.5	7.1	16.2	-42.3	10.8
37.84	-12.31	Mozambique, Lugenda	-23.3	7.4	15.2	-45.8	9.1
37.84	-12.30	Mozambique, Block L7 - Lugenda south ban	-22.0	7.5	15.5	-41.6	8.4
37.84	-12.31	Mozambique, Block L7 - Lugenda south ban	-23.1	7.0	15.5	-45.2	8.6
32.00	-14.75	Mozambique, Kambako	-20.8	7.8	16.0	-45.0	9.8
34.34	-18.66	Mozambique	-21.4	7.8	15.1	-50.3	8.2
37.30	-12.00	Mozambique, Luwure (block L7) area	-22.5	6.7	16.5	-41.6	8.9

Country of prediction: MZ

### 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

“0.076919, 0.045875, 0.020250, 0.001115, 0.000421, 0.000068, 0.000068, 0.000041, 0.000031”

**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: “**moderate fit**”