

# Spatial assignment of test sample

December 14, 2016

## 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 . . . . .	3
Goodness of fit of test sample: . . . . .	4

## Input

Website Identifier: 124

## Isotope values of test sample

Table 1: Isotope values of test sample

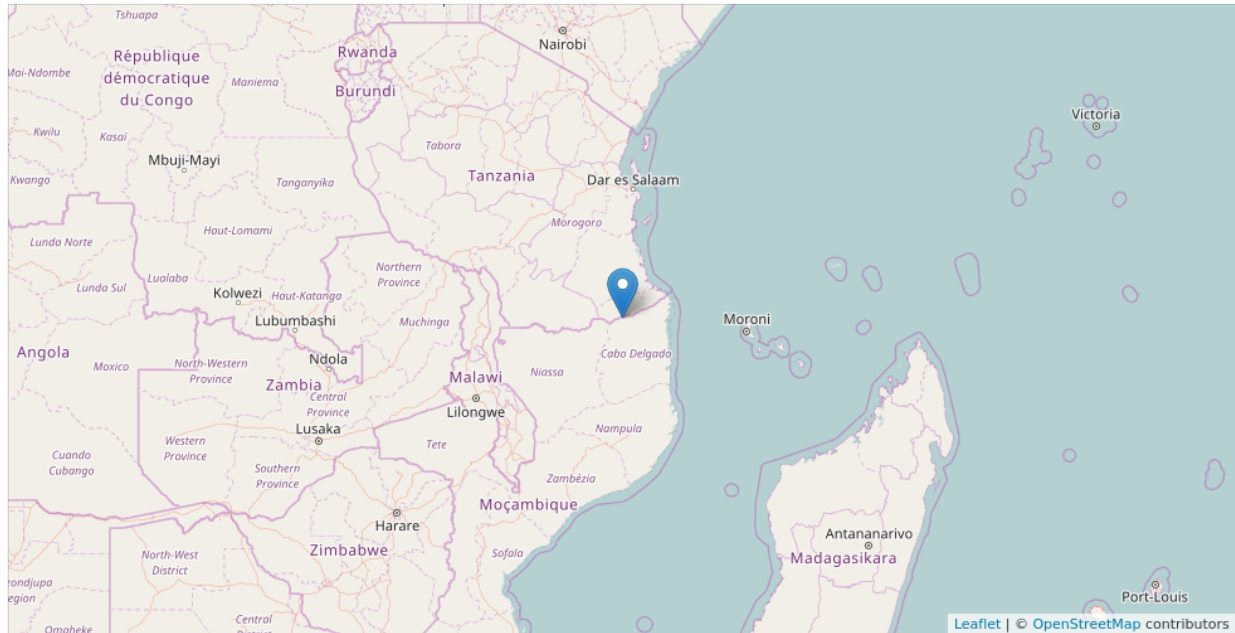
13C/12C	15N/14N	18O/16O	2H/1H	34S/32S
-21.1	7	15.8	-39.4	4.2

## 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
```

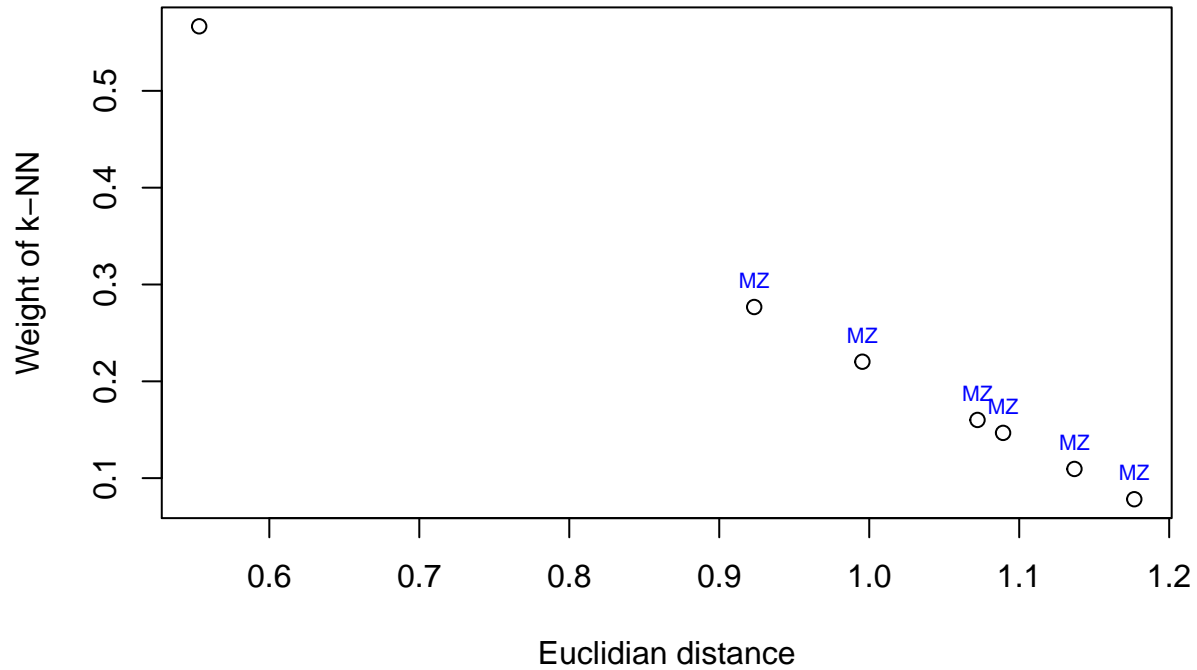
## Map of best fitted reference sample



### Best fitted reference sample:

- Site: Mozambique, Chipupa / Rovuma
- Country: MZ
- Region: Southern Africa
- CITES: Appendix I
- Lat: -11.26
- Lon: 38.91

## 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
38.91	-11.26	Mozambique, Chipupa / Rovuma	-21.1	7.4	16.1	-44.6	4.5
37.15	-12.29	Mozambique, Naulala village	-20.2	8.1	16.6	-38.9	5.6
39.00	-11.18	Mozambique, Rovuma river area	-20.8	7.0	15.4	-40.0	7.5
37.64	-12.44	Mozambique, Mbamba village area - Lugend	-22.3	8.5	16.0	-38.3	5.6
37.35	-12.00	Mozambique, Gomba	-21.6	8.0	14.3	-38.5	6.1
32.58	-14.60	Mozambique, Naulela village	-22.8	7.6	16.3	-43.8	5.7
37.55	-13.30	Mozambique, Niassa Nature Reserve	-20.8	5.7	15.0	-43.6	6.9

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

“0.35355, 0.23401, 0.10231, 0.05677, 0.01048, 0.00506, 0.00042”

**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**”