

# Spatial assignment of test sample

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## Input

Website Identifier: 357

## Isotope values of test sample

Table 1: Isotope values of test sample

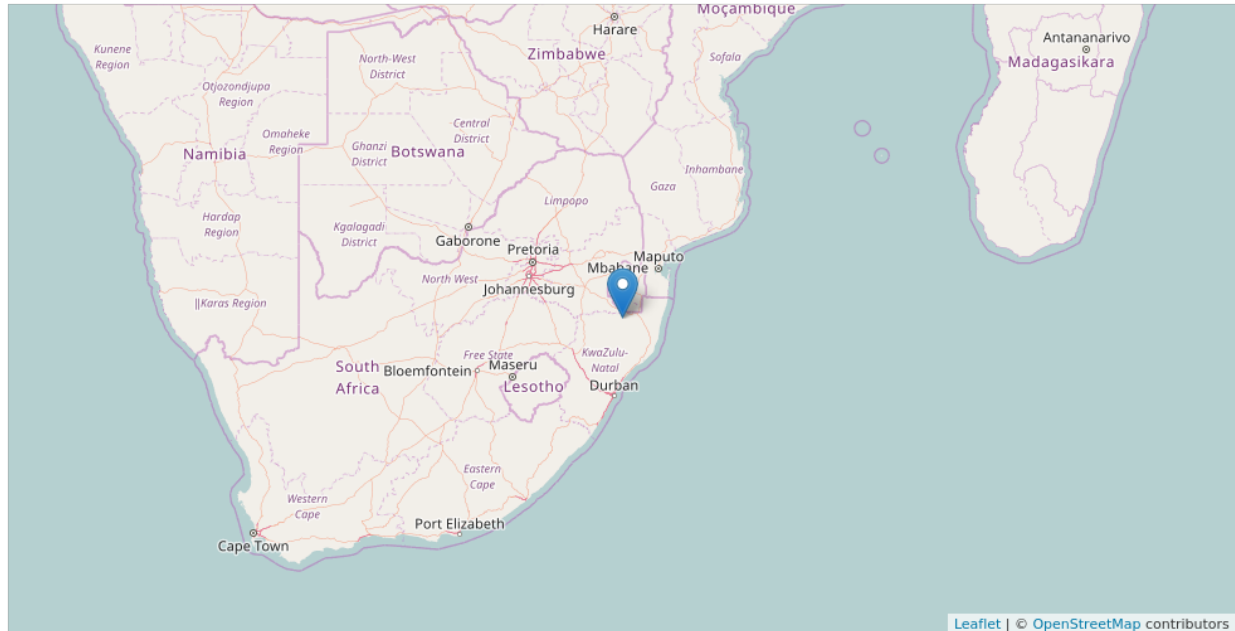
13C/12C	15N/14N	18O/16O	2H/1H	34S/32S
-21.2	7.4	17.2	-41.2	10.3

## 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
```

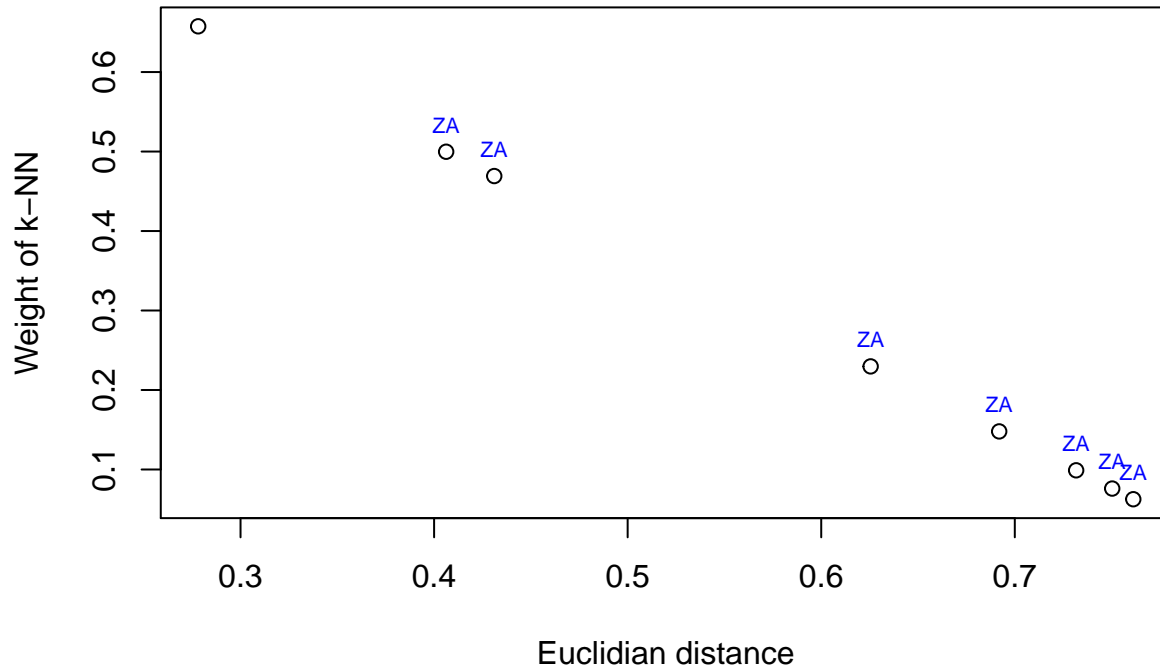
## Map of best fitted reference sample



### Best fitted reference sample:

- Site: South Africa, Ithala
- Country: ZA
- Region: Southern Africa
- CITES: Appendix II
- Lat: -27.51
- Lon: 31.29

## 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
31.29	-27.51	South Africa, Ithala	-21.4	7.1	16.9	-41.0	10.8
31.29	-27.51	South Africa, Ithala	-21.2	7.0	17.7	-42.2	11.1
31.29	-27.51	South Africa, Ithala	-21.4	7.2	17.0	-37.8	11.1
31.29	-27.51	South Africa, Ithala	-21.4	7.2	16.0	-39.9	10.5
31.29	-27.51	South Africa, Ithala	-21.8	6.6	18.1	-42.4	10.0
31.29	-27.51	South Africa, Ithala	-21.4	7.1	18.3	-39.9	11.8
27.07	-25.24	South Africa, Pilanesberg	-21.9	7.7	17.2	-38.4	8.3
27.07	-25.24	South Africa, Pilanesberg	-21.0	7.3	17.2	-36.1	8.3

Country of prediction: ZA

### 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

“0.652, 0.561, 0.425, 0.270, 0.217, 0.070, 0.051, 0.018”

**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**”