

Spatial assignment of test sample

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Input

Website Identifier: 184

Isotope values of test sample

Table 1: Isotope values of test sample

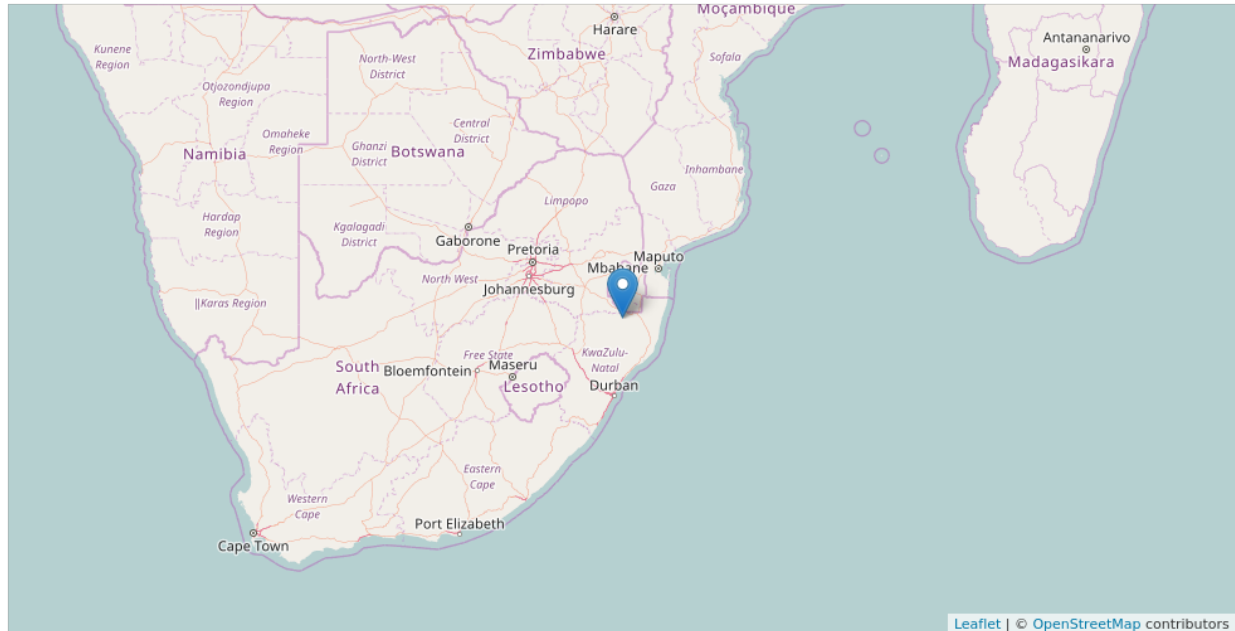
| 13C/12C | 15N/14N | 18O/16O | 2H/1H | 34S/32S |
|---------|---------|---------|-------|---------|
| -21.1 | 6.4 | 18.2 | -38.1 | 12.4 |

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
```

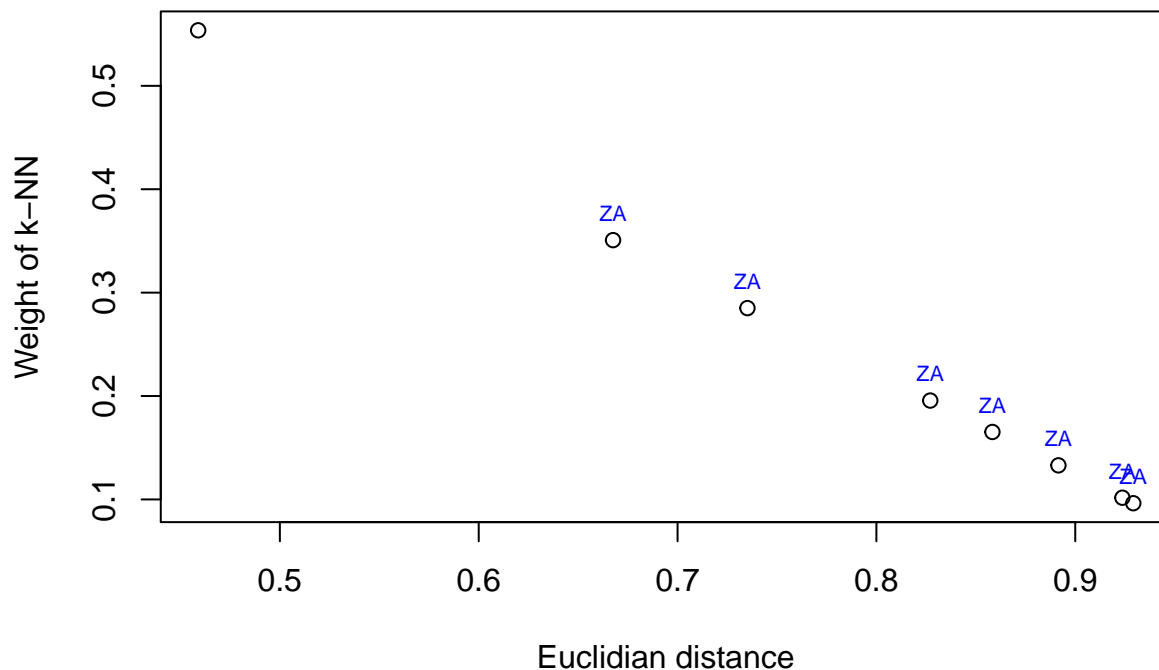
Map of best fitted reference sample



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 | 18.3 | -39.9 | 11.8 |
| 31.29 | -27.51 | South Africa, Ithala | -21.2 | 7.0 | 17.7 | -42.2 | 11.1 |
| 31.29 | -27.51 | South Africa, Ithala | -22.1 | 6.5 | 17.9 | -37.8 | 10.7 |
| 31.29 | -27.51 | South Africa, Ithala | -21.4 | 7.2 | 17.0 | -37.8 | 11.1 |
| NA | NA | South Africa, HiP | -21.7 | 7.6 | 18.9 | -39.1 | 13.7 |
| 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 | 16.9 | -41.0 | 10.8 |
| 32.29 | -28.01 | South Africa, Hluhluwe | -21.0 | 7.9 | 18.5 | -41.0 | 13.9 |

Country of prediction: ZA

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

“0.47731, 0.13370, 0.06966, 0.04110, 0.03674, 0.03674, 0.01784, 0.00063”

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**”