

# Spatial assignment of test sample

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## Input

Website Identifier: 10

### Isotope values of test sample

Table 1: Isotope values of test sample

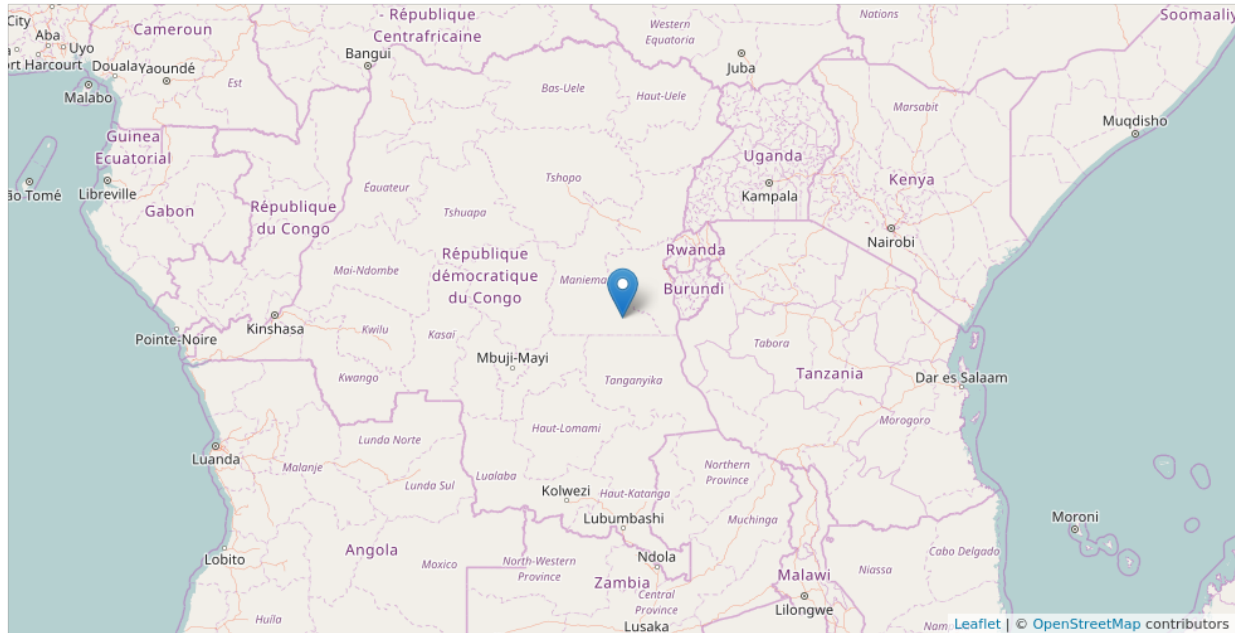
13C/12C	15N/14N	18O/16O	2H/1H	34S/32S
-20.4	9.8	17.1	-39	3.4

## 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
```

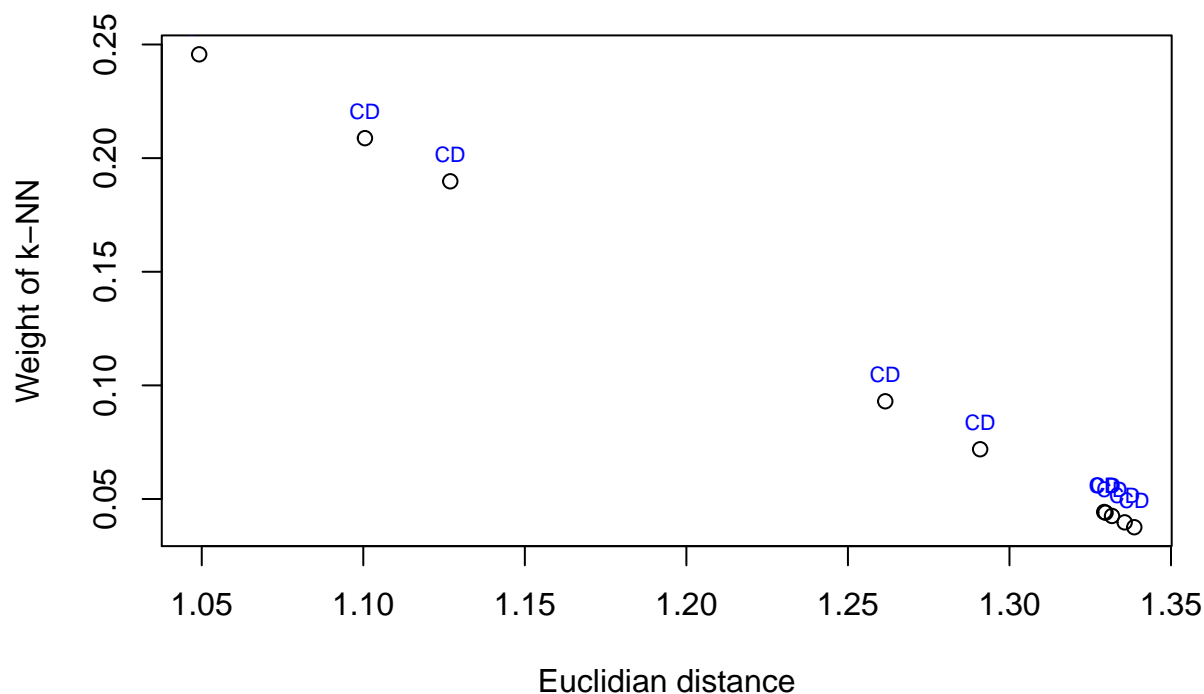
## Map of best fitted reference sample



### Best fitted reference sample:

- Site: Dem. Rep. Congo, Kabambare
- Country: CD
- Region: Central Africa
- CITES: Appendix I
- Lat: -4.42
- Lon: 27.43

## 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
27.43	-4.42	Dem. Rep. Congo, Kabambare	-22.0	8.7	16.5	-38.2	3.7
30.26	1.23	Dem. Rep. Congo, Kasenyi	-19.6	9.2	16.0	-30.5	3.9
25.26	3.40	Dem. Rep. Congo, Api	-20.2	8.1	17.4	-33.6	5.1
29.21	-1.20	Dem. Rep. Congo, Rumangabo	-18.6	8.5	17.7	-34.4	3.8
22.25	-7.12	Dem. Rep. Congo, Luisa terr	-21.0	8.3	17.5	-40.9	6.7
22.90	3.89	Dem. Rep. Congo, Uele	-22.8	10.2	17.9	-39.5	3.0
19.52	4.14	Dem. Rep. Congo, Bosobolo	-20.0	7.9	17.5	-38.8	6.4
27.20	-2.42	Dem. Rep. Congo, Bakisi	-22.4	10.9	16.3	-35.5	2.2
27.43	-4.42	Dem. Rep. Congo, Kabambare	-21.9	8.1	16.1	-37.2	4.8
29.09	3.40	Dem. Rep. Congo, Gangala na Bodio	-20.6	8.2	16.7	-29.0	5.0

Country of prediction: CD

### 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

“0.376588383, 0.331404679, 0.056772646, 0.029159027, 0.000515506, 0.000420507, 0.000000490, 0.000000309, 0.000000026, 0.000000026”

### 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**”