

# Spatial assignment of test sample

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## Input

Website Identifier: 27

## Isotope values of test sample

Table 1: Isotope values of test sample

13C/12C	15N/14N	18O/16O	2H/1H	34S/32S
-26.1	11.2	18	-47.2	12.3

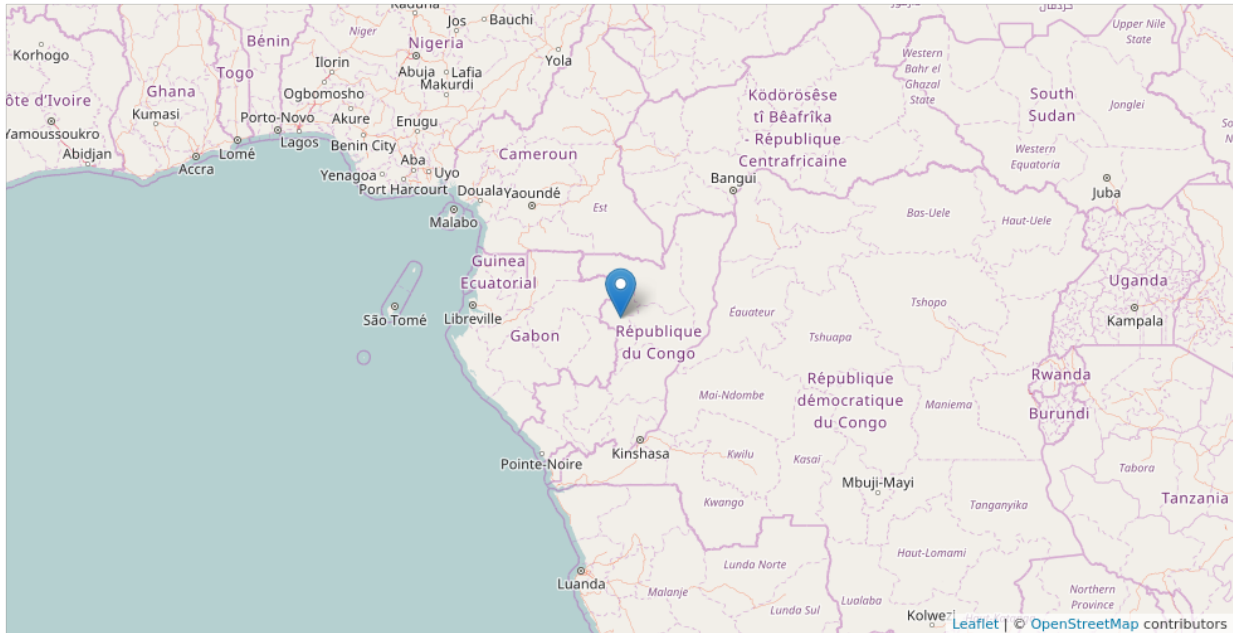
## Output

### Model

```
##
## Call:
## train.kknn(formula = fmla, data = ivory.train, kmax = 15, distance = 2, kernel = knl)
##
## Type of response variable: nominal
## Minimal misclassification: 0.1889986
## Best kernel: triangular
## Best k: 14
```

Classifier: **region**

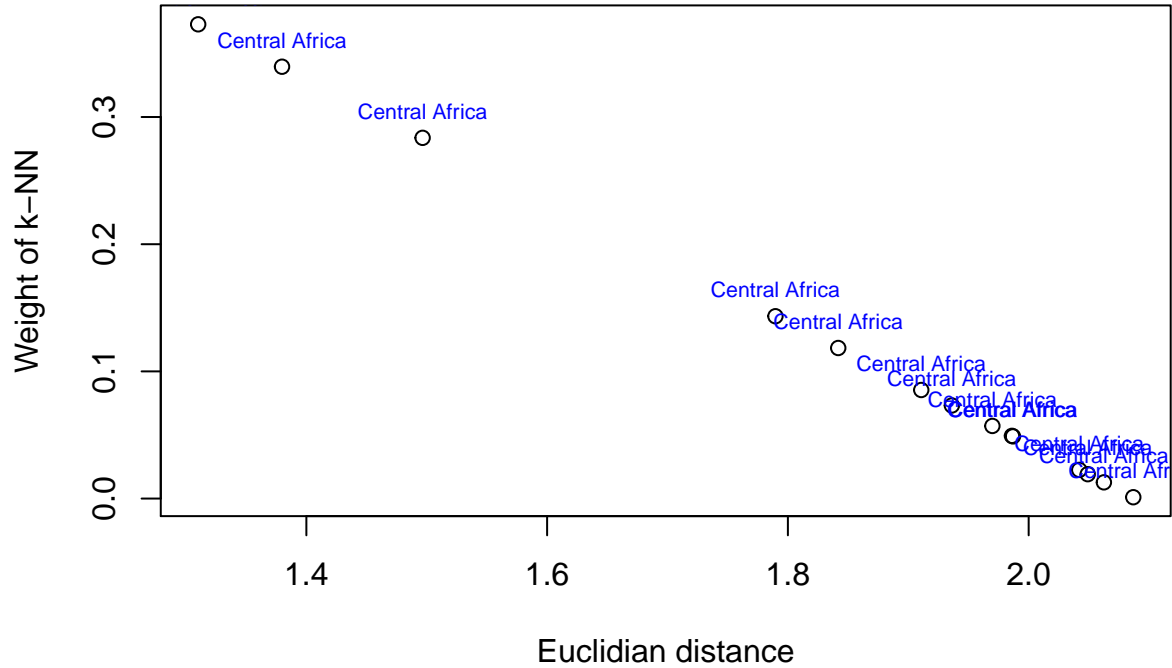
## Map of best fitted reference sample



### Best fitted reference sample:

- Site: Dem. Rep. Congo
- Country: CD
- Region: Central Africa
- CITES: Appendix I
- Lat: -0.082275
- Lon: 14.573353

## 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
14.57	-0.08	Dem. Rep. Congo	-24.9	10.3	16.4	-49.5	10.0
11.27	-3.78	Congo, Shot in Southern Congo, on the At	-24.7	11.6	15.8	-48.1	11.0
14.47	-0.01	Dem. Rep. Congo	-25.0	10.2	15.8	-49.9	10.1
11.15	2.86	Cameroon, near Ebolowa	-25.0	11.7	15.0	-52.0	10.1
19.00	8.00	Central African Republic	-25.7	12.8	19.8	-36.6	9.0
17.11	-1.10	Dem. Rep. Congo, Lukolela	-24.8	10.5	15.4	-43.4	8.4
15.08	2.43	Cameroon, S dosten Kamerun N he Kika	-25.2	13.4	19.2	-36.1	9.1
18.20	-1.55	Dem. Rep. Congo, Leopold ii meer	-25.9	10.9	17.1	-39.7	6.2
12.76	-1.18	Gabon	-26.6	10.0	15.0	-56.9	9.9
19.00	8.00	Central African Republic	-25.6	12.8	19.7	-32.8	9.4
23.55	-1.35	Dem. Rep. Congo, Moma	-25.6	10.8	16.9	-44.4	5.7
13.02	-1.43	Dem. Rep. Congo, Itoko	-24.2	10.4	18.1	-38.4	7.0
21.45	-1.00	Dem. Rep. Congo, Itoko	-24.2	10.2	16.9	-42.9	6.8
27.37	1.40	Dem. Rep. Congo, Nepoko	-24.3	10.5	18.0	-34.9	7.4

Region of prediction: Central Africa

## 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

“0.7563768, 0.7563768, 0.4582687, 0.0002586, 0.0000902, 0.0000678, 0.0000012, 0.0000002, 0.0000001, 0.0000001, 0.0000001, 0.0000001, 0.0000001, 0.0000001”

### 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**”