

# Spatial assignment of test sample

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## Input

Website Identifier: 005p562-28

## Isotope values of test sample

Table 1: Isotope values of test sample

13C/12C	15N/14N	18O/16O	2H/1H	34S/32S
-25.7	11.3	14.3	-49	11.4

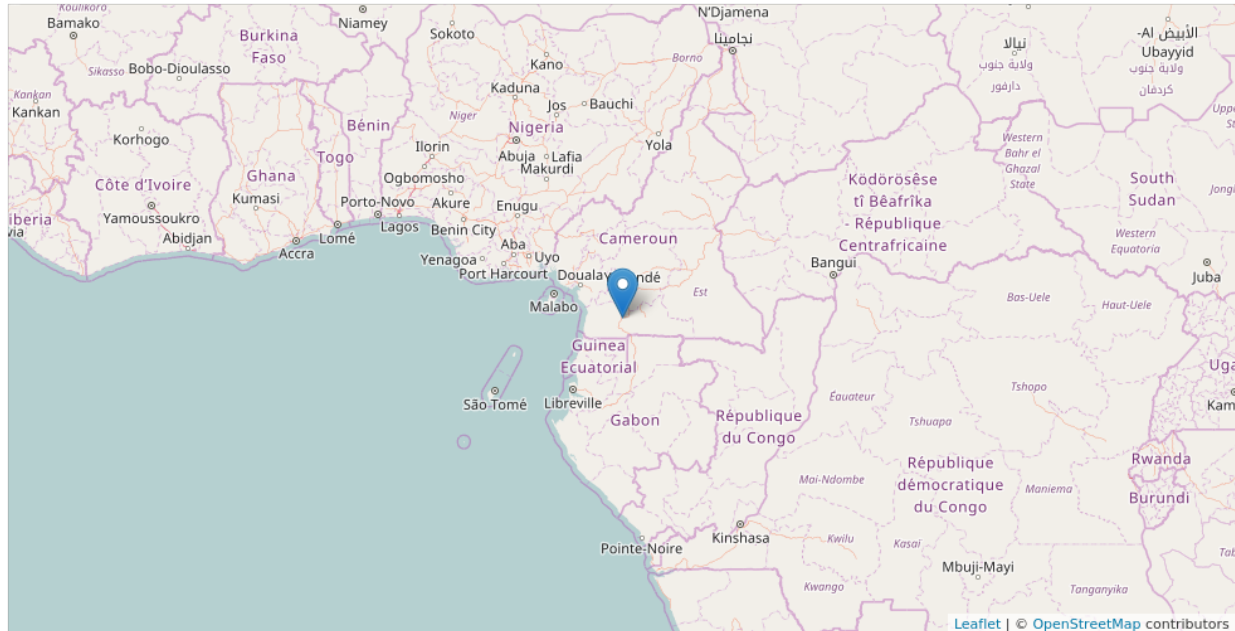
## Output

### Model

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

Classifier: **region**

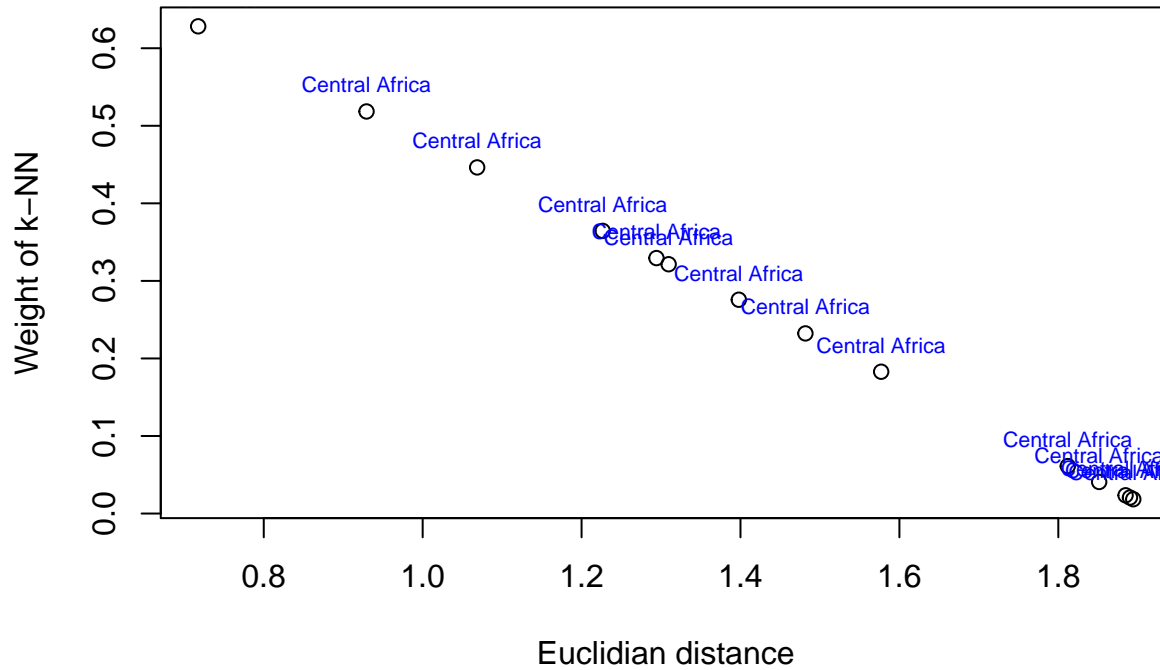
## Map of best fitted reference sample



### Best fitted reference sample:

- Site: Cameroon, near Ebolowa
- Country: CM
- Region: Central Africa
- CITES: Appendix I
- Lat: 2.86
- Lon: 11.15

## 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
11.15	2.86	Cameroon, near Ebolowa	-25.0	11.7	15.0	-52.0	10.1
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
12.76	-1.18	Gabon	-26.6	10.0	15.0	-56.9	9.9
14.57	-0.08	Dem. Rep. Congo	-24.9	10.3	16.4	-49.5	10.0
17.11	-1.10	Dem. Rep. Congo, Lukolela	-24.8	10.5	15.4	-43.4	8.4
12.76	-1.18	Gabon	-26.6	10.4	14.9	-57.1	8.2
11.64	-4.13	Congo, Shot in Southern Congo, 50km from	-25.0	8.5	14.7	-49.4	11.9
10.20	3.13	Cameroon, Lokundji	-26.7	11.1	15.5	-51.6	6.8
16.20	-3.40	Dem. Rep. Congo, Tua	-22.8	10.2	14.8	-42.0	9.8
29.50	0.45	Dem. Rep. Congo, Beni	-23.5	10.9	15.9	-43.2	7.7
12.47	4.98	Cameroon	-25.0	9.6	15.2	-50.0	6.0
22.33	-2.68	Dem. Rep. Congo, Momu	-23.7	10.8	16.0	-44.8	7.1
17.42	-1.47	Dem. Rep. Congo, Bongo	-23.8	10.4	15.7	-45.1	6.8

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

“0.349884, 0.302163, 0.279954, 0.202012, 0.169386, 0.042653, 0.022221, 0.010699, 0.009150, 0.001538, 0.000419, 0.000259, 0.000037, 0.000014”

### 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**”