

# Processing Occurrence Data

Emily Bellis

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## Description

This R markdown document describes cleaning of occurrence data and generation of background points for *Cuscuta* species described in Masanga *et al.* (submitted).

## Load libraries

```
library(raster)
```

```
## Loading required package: sp
```

```
library(maps)
```

```
library(rgdal)
```

```
## rgdal: version: 1.5-12, (SVN revision 1018)
```

```
## Geospatial Data Abstraction Library extensions to R successfully loaded
```

```
## Loaded GDAL runtime: GDAL 3.1.1, released 2020/06/22
```

```
## Path to GDAL shared files: /Library/Frameworks/R.framework/Versions/4.0/Resources/library/rgdal/gdal
```

```
## GDAL binary built with GEOS: TRUE
```

```
## Loaded PROJ runtime: Rel. 6.3.1, February 10th, 2020, [PJ_VERSION: 631]
```

```
## Path to PROJ shared files: /Library/Frameworks/R.framework/Versions/4.0/Resources/library/rgdal/proj
```

```
## Linking to sp version:1.4-2
```

```
## To mute warnings of possible GDAL/OSR exportToProj4() degradation,
```

```
## use options("rgdal_show_exportToProj4_warnings"="none") before loading rgdal.
```

```
library(rgbif)
```

```
data(worldMapEnv)
```

## Field data for Kenya collected by Runo lab

```
occ <- read.csv("Cuscuta_georeferenced.csv")
```

```
cc <- subset(occ, Cuscuta.Species=="C. campestris")
```

```
nrow(cc)
```

```
## [1] 26
```

```
cr <- subset(occ, Cuscuta.Species=="C. reflexa")
```

```
nrow(cr)
```

```
## [1] 67
```

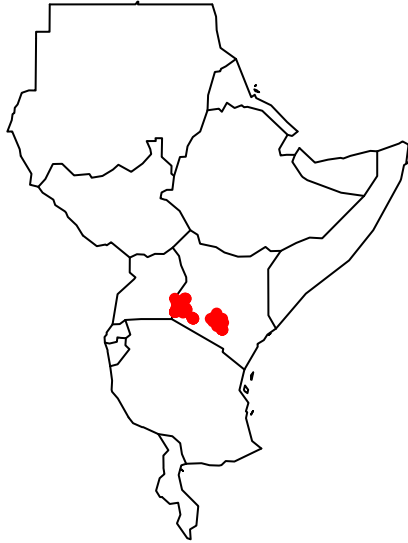
```
ck <- subset(occ, Cuscuta.Species=="C. kilimanjari")
```

```
nrow(ck)
```

```
## [1] 3
```

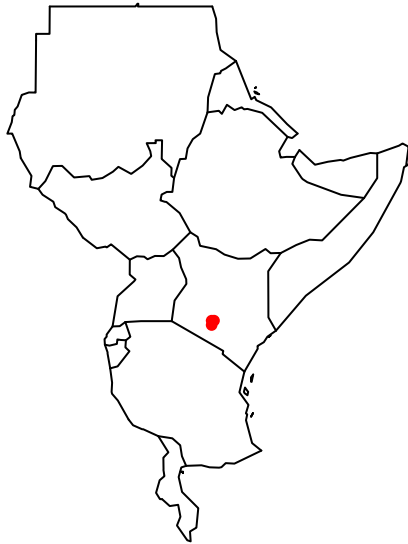
## *C. reflexa*

```
## Get all occurrences
# no African occurrences in GBIF
map(database="world", regions=c("Kenya","Tanzania","Ethiopia","Uganda","Rwanda","Burundi","Sudan","South Africa"),
points(cr$Long, cr$Lat, col="red", pch=20)
```



## *C. kilimanjari*

```
## Get all occurrences
map(database="world", regions=c("Kenya","Tanzania","Ethiopia","Uganda","Rwanda","Burundi","Sudan","South Africa"),
points(ck$Long, ck$Lat, col="red", pch=20)
```



```
# from GBIF
```