Interactive Phylogenetic Tree

2024-11-19

#PACKAGE LOADING

```
#Load packages
library(phytools) #Read in phylogeny
```

```
## Loading required package: ape
```

```
## Loading required package: maps
```

```
library(ape) #For the phylo.vcv function
library(geiger) #For name.check function
library(tidyverse) #For piping command
```

```
## -- Attaching core tidyverse packages ------------------------ tidyverse 2.0.0 --
## v dplyr     1.1.4     v readr     2.1.5
## v forcats   1.0.0     v stringr   1.5.1
## v ggplot2   3.5.1     v tibble    3.2.1
## v lubridate 1.9.3     v tidyr     1.3.1
## v purrr     1.0.2
```

```
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
## x purrr::map()    masks maps::map()
## x dplyr::where()  masks ape::where()
## i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors
```

```
library(ggraph)
library(igraph)
```

```
##
## Attaching package: 'igraph'
##
## The following objects are masked from 'package:lubridate':
##
##     %--%, union
##
## The following objects are masked from 'package:dplyr':
##
##     as_data_frame, groups, union
##
## The following objects are masked from 'package:purrr':
##
##     compose, simplify
##
## The following object is masked from 'package:tidyr':
##
##     crossing
```

```
##
## The following object is masked from 'package:tibble':
##
##     as_data_frame
##
## The following objects are masked from 'package:ape':
##
##     degree, edges, mst, ring
##
## The following objects are masked from 'package:stats':
##
##     decompose, spectrum
##
## The following object is masked from 'package:base':
##
##     union
```

```
library(htmlwidgets)
library(phylocanvas)
```

```
##
## Attaching package: 'phylocanvas'
##
## The following object is masked from 'package:igraph':
##
##     as_tree
```

#DATAFRAME

```
df <- read.csv("~/Desktop/Menstrual taboos/R CODE DATA FILES (USE)/Master's data set.csv", header=TRUE)
```

#PHYLOGENETIC TREE

```
phylo<-readNexus("~/Desktop/Menstrual taboos/R CODE DATA FILES (USE)/Time-calibrated SCCS supertree ulti
```

#MAKE CULTURE NAMES THE ROWNAMES IN DATAFRAME

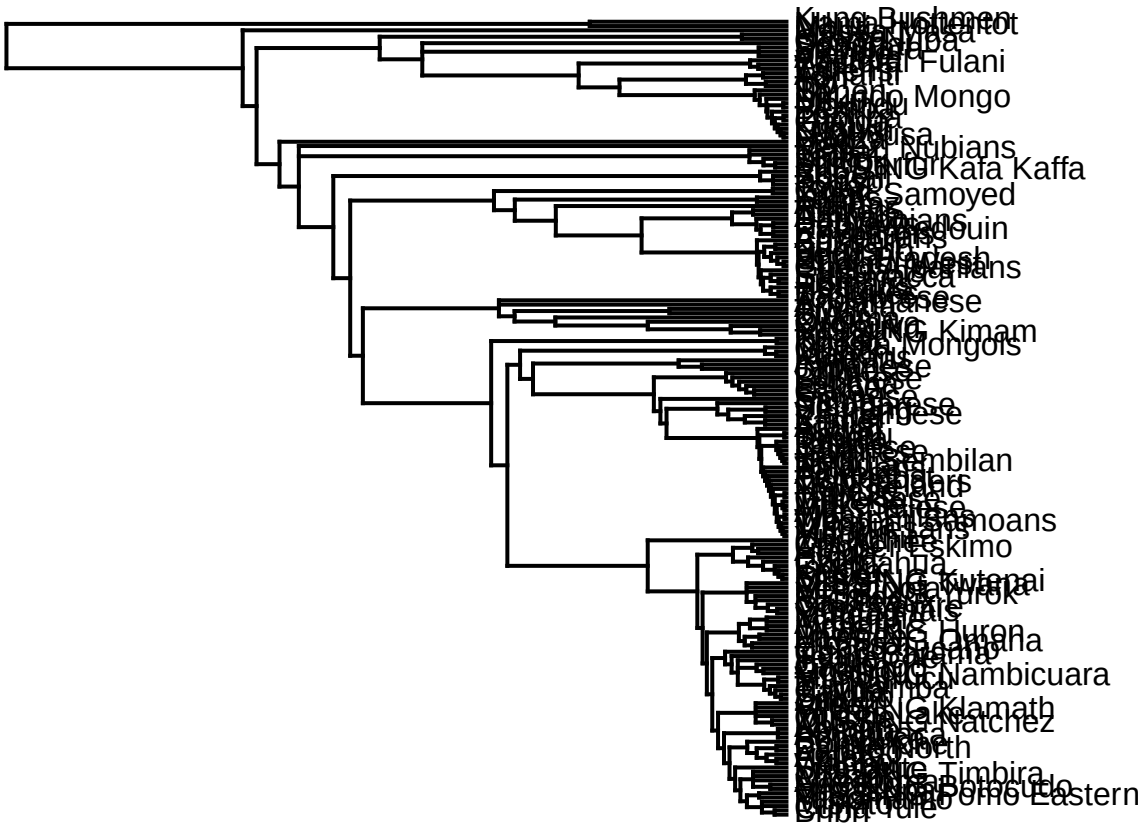
```
rownames(df) <- df$tip.label #Set rownames in data frame

pop <- df[,2] #Store the population column

str(df) #Look at data frame
```

```
## 'data.frame':    144 obs. of  17 variables:
##  $ HRAF.culture                : chr  "Babylonians" "Zuni" "Teda" "O'odham" ...
##  $ tip.label                   : chr  "Babylonians" "Zuni" "Teda" "Papago" ...
##  $ Expression                  : int  1 0 1 1 1 1 1 1 1 ...
##  $ Restrictiveness             : int  3 0 1 3 1 2 1 3 3 1 ...
##  $ lat                         : int  33 36 21 32 23 -24 32 43 23 12 ...
##  $ long                        : int  45 -109 18 -112 39 134 -110 -119 7 -72 ...
##  $ Subsistence_Pattern         : chr  "Intensive Agricultralists" "Intensive Agricultralists" "Agro-
##  $ Subsistence                 : chr  "Agriculture" "Agriculture" "Agriculture" "Agriculture" ...
##  $ Biome                       : chr  "Deserts & Xeric Shrublands" "Deserts & Xeric Shrublands" "Dese
##  $ Landscape                   : chr  "Deserts" "Deserts" "Deserts" "Deserts" ...
##  $ MeanMonthlyTemperature      : int  23 10 22 22 27 21 14 7 20 26 ...
##  $ Temperature_Predictability  : num  0.64 0.579 0.642 0.615 0.725 ...
##  $ Temperature_Variance        : int  111 103 46 62 24 37 70 84 55 1 ...
```

```
##  $ Precipitation_Variance      : num  1.72e+08 7.89e+08 1.57e+08 7.05e+08 1.85e+08 ...
##  $ MeanMonthlyPrecipitation    : num  7853 41599 5593 24750 6403 ...
##  $ Precipitation_Predictability: num  0.347 0.556 0.304 0.404 0.249 ...
##  $ Men_Poly                    : int  0 0 10 27 NA 60 18 12 0 40 ...
```

#CLEAN PHYLOGENETIC TREE FOR ANALYSIS

```
plotTree(phylo) #Look at phylogeny
```




```
name.check (phylo,df$tip.label) # check which populations are in the tree but not in the data and remov
```

```
## $tree_not_data
##   [1] "Abipon"              "Abkhaz"              "Ainu"
##   [4] "Ajie"                "Aleut"               "Alorese"
##   [7] "Amahuaca"            "Amhara"              "Andamanese"
##  [10] "Aranda"              "Armenians"           "Ashanti"
##  [13] "Atayal"              "Aweikoma"            "Aymara"
##  [16] "Azande"              "Aztec"               "Babylonians"
##  [19] "Badjau"              "Balinese"            "Bambara"
##  [22] "Banen"               "Basques"             "Basseri"
##  [25] "Bellacoola"          "Bemba"               "Bogo"
##  [28] "Bribri"              "Burmese"             "Burusho"
##  [31] "Callinago"           "Carib_Barama"        "Cayapa"
##  [34] "Cayua"               "Chinese"             "Chiricahua"
##  [37] "Chukchee"            "Comanche"            "Copper_Eskimo"
##  [40] "Creek"               "Cubeo_Tucano"        "Cuna_Tule"
##  [43] "Egyptians"           "Eyak"                "Fon"
##  [46] "Fur_Darfur"          "Ganda"               "Garo"
##  [49] "Gheg_Albanians"      "Gilbertese"          "Gilyak"
```

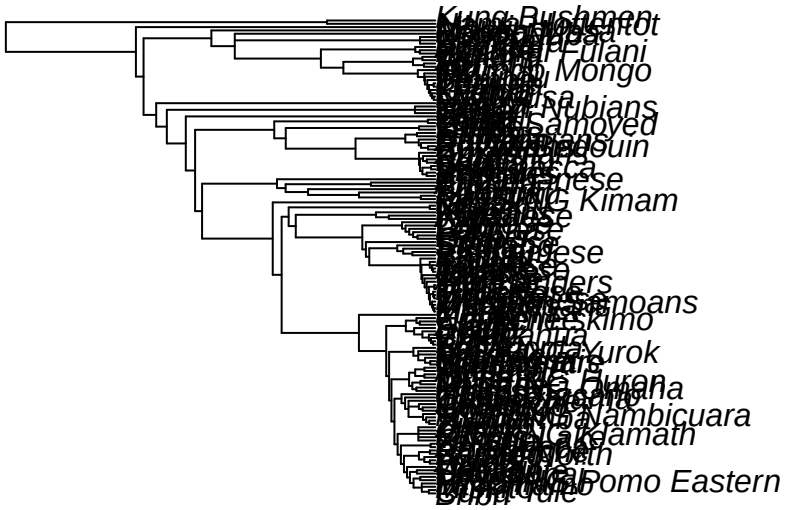
```
##  [52] "Goajiro"              "Gond"                 "Gros_Ventre"
##  [55] "Hadza"                "Haida"                "Haitians"
##  [58] "Hausa"                "Havasupai"            "Hebrews"
##  [61] "Hidatsa"              "Huichol"              "Iban"
##  [64] "Ibo"                  "Ifugao"               "Inca"
##  [67] "Ingalik"              "Irish"                "Japanese"
##  [70] "Javanese"             "Jivaro"               "Kapauku"
##  [73] "Kaska"                "Kazak"                "Kenuzi_Nubians"
##  [76] "Khalka_Mongols"       "Khmer"                "Kikuyu"
##  [79] "Konso"                "Koreans"              "Kung_Bushmen"
##  [82] "Kurd"                 "Kwoma"                "Lakher"
##  [85] "Lamet"                "Lapps"                "Lengua"
##  [88] "Lepcha"               "Lolo"                 "Lozi"
##  [91] "Luguru"               "Manchu"               "Manus"
##  [94] "Mao"                  "Maori"                "Mapuche"
##  [97] "Marquesans"           "Marshallese"          "Masai"
## [100] "Massa_Masa"           "Mbau_Fijians"         "Mbundu"
## [103] "Mbuti"                "Mende"                "Micmac"
## [106] "Miskito"              "MISSING_Botocudo"     "MISSING_Huron"
## [109] "MISSING_Kafa_Kaffa"   "MISSING_Kimam"        "MISSING_Klamath"
## [112] "MISSING_Kutenai"      "MISSING_Nambicuara"   "MISSING_Natchez"
## [115] "MISSING_Omaha"        "MISSING_Pomo_Eastern" "MISSING_Timbira"
## [118] "MISSING_Twana"        "MISSING_Yurok"        "Montagnais"
## [121] "Mundurucu"            "Nama_Hottentot"       "Negri_Sembilan"
## [124] "New_Ireland"          "Nicobarese"           "Nkundo_Mongo"
## [127] "Nyakyusa"             "Orokaiva"             "Otoro_Nuba"
## [130] "Paiute_North"         "Palauans"             "Papago"
## [133] "Pastoral_Fulani"      "Pawnee"               "Pentecost"
## [136] "Popoluca"             "Punjabi_West"         "Quiche"
## [139] "Rhade"                "Riffians"             "Romans"
## [142] "Russians"             "Rwala_Bedouin"        "Santal"
## [145] "Saramacca"            "Saulteaux"            "Semang"
## [148] "Shavante"             "Shilluk"              "Siamese"
## [151] "Siriono"              "Siuai"                "Slave"
## [154] "Somali"               "Songhai"              "Suku"
## [157] "Tallensi"             "Tanala"               "Teda"
## [160] "Tehuelche"            "Thonga"               "Tikopia"
## [163] "Tiv"                  "Tiwi"                 "Tobelorese"
## [166] "Toda"                 "Toradja"              "Trobrianders"
## [169] "Trukese"              "Trumai"               "Tuareg"
## [172] "Tupinamba"            "Turks"                "Uttar_Pradesh"
## [175] "Vedda"                "Vietnamese"           "Warrau"
## [178] "Western_Samoans"      "Wolof"                "Yahgan"
## [181] "Yanomamo"             "Yapese"               "Yokuts_Lake"
## [184] "Yukaghir"             "Yurak_Samoyed"        "Zuni"
##
## $data_not_tree
## NULL
```

```
MT_Tree <- drop.tip (phylo, tip=c("Abipon", "Abkhaz", "Ajie", "Atayal", "Aweikoma", "Banen", "Basseri",

name.check (MT_Tree, df) # OK
```

```
## [1] "OK"
```

```
write.tree (MT_Tree, "MT.Phylo") # write the reduced tree

phylo.Reduced <- read.tree("MT.Phylo")

phylo_vcv <- vcv.phylo(phylo, cor=TRUE)
phylo.reduced <- vcv.phylo(phylo.Reduced, cor=TRUE)
```

```
plot(phylo.Reduced,type="tidy")
```




```
p <- phylocanvas(phylo.Reduced, treetype = "rectangular", nodestyles = NULL,
nodesize = 30, textsize = 30, linewidth = 3, showlabels = TRUE,
alignlabels = TRUE, showhistory = FALSE, showcontextmenu = TRUE,
showscalebar = FALSE, width = NULL, height = NULL, elementId = NULL )

p
```

```
#saveWidget(p, file=paste0( getwd(), "/Desktop/Menstrual taboos/R CODE DATA FILES (USE)/InteractiveMap.
```