Tree from Open Tree

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Insects - 1 million named species Mammals - 5k named species Flowering plants - 200k named species

Read a newick tree from the Open Tree of Life

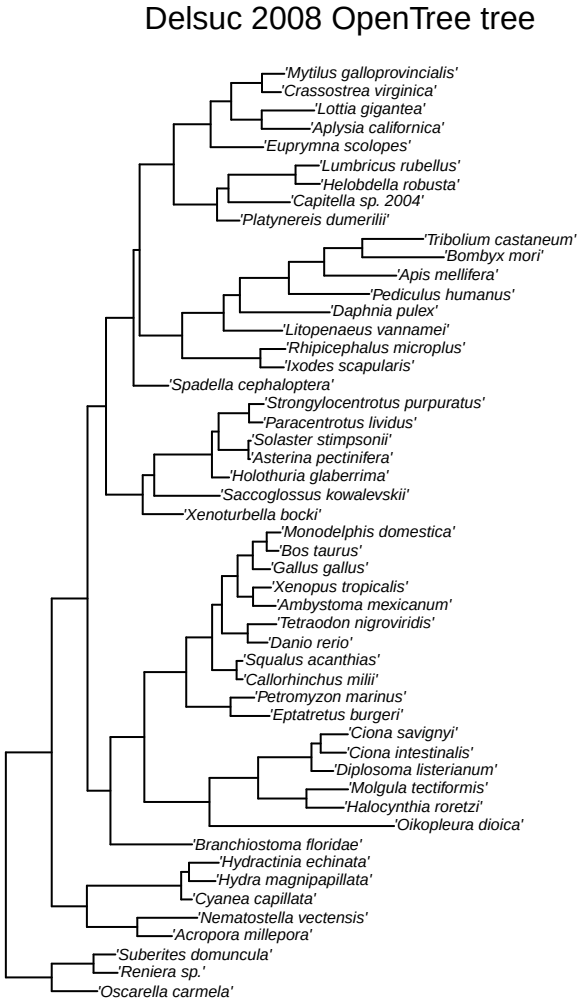
The following function can only read trees in newick format. Make sure your file is a newick tree. If you got your tree from the Phylesystem repo, you tree is going to be in json format and will not be read by the function.

Newick Tree downloaded from https://tree.opentreeoflife.org/opentree/opentree13.4@ott118027/Gymnophiona

```
tree <- read.tree(file = "../data-raw/delsuc_2008.tre")
```

Now plot the tree:

```
plot(tree, cex = 0.5)
mtext(text = "Delsuc 2008 OpenTree tree")
```



We can also use the url of a tree to read a tree into R. We will provide th eURL in the argument `file =`. In this case, we do not have to keep a copy of the file, we can just download it directly The url is "http://ape-package.ird.fr/APER/APER2/primfive.tre":

```
small_tree <- read.tree(file = "http://ape-package.ird.fr/APER/APER2/primfive.tre")
small_tree
```

```
##
## Phylogenetic tree with 5 tips and 4 internal nodes.
##
## Tip labels:
##   Homo, Pongo, Macaca, Ateles, Galago
##
## Rooted; includes branch lengths.
```

The R structure of a phylogenetic tree

Getting a tree for your species from the Open Tree of Life

The Open Tree of Life has tools that allow to match the names of a group or species to their unified taxonomy so that we can look for information on their databases.

If we are doing this in R, we are using the `tnrs_match_names()` from the package `rotl`; tnrs stands for taxonomic name resolution service:

```
tnrs <- tnrs_match_names(names = "amphibians")
class(tnrs)
```

```
## [1] "match_names" "data.frame"
```

```
tnrs
```

```
##   search_string unique_name approximate_match ott_id is_synonym flags
## 1    amphibians    Amphibia              TRUE 544595      FALSE
##   number_matches
## 1              6
```

What is the main difference between the information that we have in the coumn `search_string` and `unique_name`: One is the search string and the other is the scientific taxonomic name from the Open Tree of Life unified Taxonomy (OTT).

We can use the unique number identifier from OTT to get information fro that taxon.

To get a tree we can use the function `tol_subtree()`

```
tol_subtree(ott_id = tnrs$ott_id)
```

```
## Progress [--------------------------------] 0/189 (  0) ?sProgress [==============================]
```

```
## Warning in collapse_singles(tr, show_progress): Dropping singleton nodes
## with labels: Rana clamitans ott515378, Rana sphenocephala ott61437, Rana
## aurora ott771201, Glandirana ott407917, Pterorana ott3618410, Pelophylax
## cf ott7070897, Hemimantis ott4133632, Microdiscopus ott4133623, Montorana
## ott4133633, Chiromantis vittatus ott389176, Mercurana ott4133643, Beddomixalus
## ott4133641, Buergeriinae ott223222, Maitsomantis ott678997, Boehmantis
## ott484429, laevigata group ott189959, bernhardi group ott189958, Wakea
## ott484449, Tsingymantis ott976861, Boophinae ott764200, Laliostoma ott1054409,
## Ombrana ott4133654, Chrysopaa ott4133659, Alcalinae ott5926144, Liurananinae
## ott5926192, Natalobatrachus ott532110, Nothophryne ott3618085, Cacosternum
## nanum ott676305, Microbatrachella ott751405, Poyntonia ott475120, Anhydrophryne
## ott113819, Ericabatrachus ott3618087, Phrynobatrachidae ott504589, Micrixalidae
## ott1081209, Odontobatrachidae ott5536254, Lanzarana ott3618164, Trichobatrachus
## ott780979, Pararthroleptis ott4133674, Hyperolius fusciventris ott85268,
## Chlorolius ott3619081, Tachycnemis (genus in Deuterostomia) ott750024, Morerella
## ott85260, Kassinula ott3619075, Opisthothylax ott645881, Chrysobatrachus
## ott3619077, Callixalus ott3619073, Arlequinus ott3619083, Semnodactylus
## ott62328, Tornierella ott4133669, Breviceps adspersus ott3618690, Spelaeophryne
## ott660153, Probreviceps macrodactylus ott111206, Balebreviceps ott348136,
## Hemisotidae ott165721, Oninia ott789802, Genyophryne ott21522, Siamophryne
## ott7070469, Melanobatrachus ott701612, Kalophrynidae ott977735, Phrynella (genus
## in Opisthokonta) ott401609, Mysticellus ott7070618, Dermatonotus ott186184,
## Gastrophryne olivacea ott565409, Arcovomer ott844415, Adelastinae ott5800508,
## Adelastes ott3618939, Dasypops ott513414, Relictivomer ott190096, Anilany
## ott5926118, Madecassophryne ott3618941, Parhoplophryne ott3618937, Otophryninae
## ott404351, Phrynomerinae ott630304, Caluella ott7666463, Corythomantis
## ott442032, Argenteohyla ott578372, Argenteohyla siemersi ott100569, Nyctimantis
## ott1087156, Itapotihyla ott257368, Hyla annectans ott655531, Anotheca ott59159,
## Diaglena ott3620134, Acris crepitans ott59141, Quilticohyla ott7070260, Rheohyla
## ott7070262, Nesorohyla ott7070190, Pachymedusa ott254792, Dryaderces ott7666055,
## Didynamipus ott152264, Barbarophryne ott5800473, Churamiti ott104959, Bufotes
## pewzowi ott1072351, Schismaderma ott506368, Sabahphrynus ott4133471, Strauchbufo
## ott6158681, Epidalea ott334615, Anaxyrus americanus ott889326, Laurentophryne
## ott3619734, Parapelophryne ott3619737, Pseudobufo ott3619739, Bufoides
```

```
## ott3619731, Metaphryniscus ott3619751, Blythophryne ott5926045, Ghatophryne
## ott7069948, Rentapia ott7069968, Silverstoneia nubicola ott638061, Hyloxalinae
## ott1096759, Lithodytes ott315881, Scythrophrys ott462991, Rupirana ott3620326,
## Phrynocerus ott3619498, Physalalemus ott6158772, Niedenia ott4133301,
## Allophrynidae ott57740, Macrogenioglottus ott726713, Insuetophrynus ott44381,
## Telmatobiinae ott777187, Hylorina ott440882, Chaltenobatrachus ott6158620,
## Limnomedusa ott914517, Chacophrys ott431943, Caudiverbera ott1068325,
## Atopophrynus ott3620196, Geobatrachus ott3620197, Ceuthomantinae ott277741,
## Megistolotis ott276283, Adelotus ott276281, Assa (genus in Opisthokonta)
## ott906692, Paracrinia ott989413, Metacrinia ott412471, Spicospina ott1039925,
## Rheobatrachidae ott918183, Hadromophryne ott971912, Atympanophrys ott542885,
## Vibrissaphora ott535112, Pelodytidae ott509554, Xenopodinae ott940173,
## Pseudhymenochirus ott140873, Rhinophrynidae ott459016, Rhinophrynus ott459015,
## Alytinae ott5334814, Discoglossus galganoi ott461369, Latonia ott4948216,
## Leiopelmatidae ott611960, Ascaphidae ott1013114, Pelodryadidae ott3620482,
## Ranoidea (genus in family Pelodryadidae) ott7666856, Iranodon ott7071233,
## Ranodon ott834698, Satobius ott5800418, Pachyhynobius ott1021854, Ambystomatidae
## ott984723, Dicamptodontidae ott60819, Laotriton ott4948201, Triturus marmoratus
## ott1041767, Triturus carnifex ott1041783, Ommatotriton ophryticus ott645229,
## Lissotriton helveticus ott9366, Lissotriton boscai ott830424, Tylototriton
## verrucosus ott932561, Tylototriton wenxianensis ott981376, Pleurodeles waltl
## ott566038, Lyciasalamandra fazilae ott1024882, Salamandrininae ott4948210,
## Pingia ott4132654, Isthmura bellii ott46162, Isthmura sierraoccidentalis
## ott98841, Parvimolge ott46159, Bradytriton ott798666, Nyctanolis ott224306,
## Haideotriton ott133635, Eurycea multiplicata ott839995, Stereochilus (genus
## in Opisthokonta) ott798664, Hemidactylium ott798658, Phaeognathus ott964128,
## Karsenia ott893551, Ensatina ott64118, Hydromantes imperialis ott675243,
## Atylodes (genus in Deuterostomia) ott693464, Hydromantoides ott4132648,
## Amphiumidae ott566022, Rhyacotritonidae ott459010, Sirenoidea ott336754,
## Chikilidae ott4948197, Praslinia ott80530, Sylvacaecilia ott3617918,
## Atretochoana ott3617929, Potamotyphlus ott7667119, Bdellophis ott4132629
##
## Phylogenetic tree with 10020 tips and 4669 internal nodes.
##
## Tip labels:
##   Odorrana_geminata_ott114, Odorrana_chapaensis_ott214633, Odorrana_grahami_ott43280, Odorrana_margar
## Node labels:
##   Amphibia ott544595, Batrachia ott471197, Anura ott991547, , , , ...
##
## Unrooted; no branch lengths.
```

Exercise

Get a subtree from a group; extract the OTT id using the function `tnrs_match_names()`.