

Nomenclature harmonization

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```
# setup -----
library(tidyverse)

## -- Attaching core tidyverse packages ----- tidyverse 2.0.0 --
## v dplyr     1.1.4     v readr     2.1.6
## v forcats   1.0.1     v stringr   1.6.0
## v ggplot2   4.0.1     v tibble    3.3.0
## v lubridate 1.9.4     v tidyr    1.3.2
## v purrr    1.2.0
## -- Conflicts ----- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()   masks stats::lag()
## i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors

library(readxl)

# taxonomic harmonization -----
#with TNRS
speciesharm <- read_csv("data/tnrs_result.csv") |>
  select(c("Name_submitted", "Accepted_species", "Accepted_family"))

## Rows: 148 Columns: 48
## -- Column specification -----
## Delimiter: ","
## chr (25): Name_submitted, Name_matched, Name_matched_rank, Author_submitted, ...
## dbl (10): Overall_score, Name_matched_id, Name_score, Author_score, Genus_sc...
## num  (2): ID, unique_id
## lgl  (11): Family_submitted, Family_matched, Family_score, Infraspecific_rank...
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.

speciesharm[146,2] <- "Cyclamen repandum" #not accepted yet
speciesharm[146,3] <- "Primulaceae"
speciesharm[147,2] <- "Stellaria nemorum" #error because of subsp.

specieslist <- read_excel("data/Species_list.xlsx")
specieslist <- specieslist |>
```

```

left_join(speciesharm, by = join_by("Species name"=="Name_submitted")) |>
  rename(species = "Accepted_species") |>
  rename(code = Code) |>
  rename(family = "Accepted_family") |>
  filter(!is.na(species)) |>
  select(!"Species name")

```

Here is the output. The reference species list is larger than the list for the transect, so some species don't have a transect code.

```
print(specieslist, n = 150)
```

```

## # A tibble: 143 x 3
##   code   species           family
##   <chr> <chr>             <chr>
## 1 AB    Abies alba        Pinaceae
## 2 ACE   Acer opalus       Sapindaceae
## 3 PLA   Acer platanoides Sapindaceae
## 4 PSE   Acer pseudoplatanus Sapindaceae
## 5 ACH   Achillea millefolium Asteraceae
## 6 <NA>  Aconitum lycocotonum Ranunculaceae
## 7 <NA>  Actaea spicata  Ranunculaceae
## 8 AUS   Adenostyles australis Asteraceae
## 9 ADO   Adoxa moschatellina Viburnaceae
## 10 AEG   Aegopodium podagraria Apiaceae
## 11 AJU   Ajuga reptans    Lamiaceae
## 12 AL    Alliaria petiolata Brassicaceae
## 13 URS   Allium ursinum   Amaryllidaceae
## 14 ANE   Anemonoides nemorosa Ranunculaceae
## 15 A    Aremonia agrimonoides Rosaceae
## 16 ARP   Arisarum proboscideum Araceae
## 17 ARU   Arum maculatum   Araceae
## 18 PHY   Asplenium scolopendrium Aspleniaceae
## 19 <NA>  Asplenium trichomanes Aspleniaceae
## 20 <NA>  Athyrium filix-femina Aspleniaceae
## 21 AVE   Avenella flexuosa   Poaceae
## 22 BRA   Brachypodium sylvaticum Poaceae
## 23 CAM   Campanula trachelium Campanulaceae
## 24 <NA>  Cardamine amara  Brassicaceae
## 25 BUL   Cardamine bulbifera Brassicaceae
## 26 CHE   Cardamine chelidonia Brassicaceae
## 27 HEPT  Cardamine heptaphylla Brassicaceae
## 28 CIMP  Cardamine impatiens Brassicaceae
## 29 TRI   Cardamine trifolia  Brassicaceae
## 30 CARD  Carduus personata  Asteraceae
## 31 <NA>  Carex divulsa    Cyperaceae
## 32 CRE   Carex remota     Cyperaceae
## 33 CAR   Carex sylvatica  Cyperaceae
## 34 <NA>  Cephalanthera rubra Orchidaceae
## 35 <NA>  Chaerophyllum temulum Apiaceae
## 36 CIR   Circaea lutetiana Onagraceae
## 37 <NA>  Cirsium erisithales Asteraceae
## 38 CLE   Clematis vitalba  Ranunculaceae

```

##	39	CLI	<i>Clinopodium nepeta</i>	Lamiaceae
##	40	COS	<i>Calystegia sepium</i>	Convolvulaceae
##	41	CRA	<i>Crataegus monogyna</i>	Rosaceae
##	42	CRU	<i>Cruciata glabra</i>	Rubiaceae
##	43	CYC	<i>Cyclamen repandum</i>	Primulaceae
##	44	<NA>	<i>Cystopteris fragilis</i>	Cystopteridaceae
##	45	CY	<i>Cytisus scoparius</i>	Fabaceae
##	46	DAC	<i>Dactylis glomerata</i>	Poaceae
##	47	<NA>	<i>Dactylorhiza incarnata</i>	Orchidaceae
##	48	DA	<i>Daphne laureola</i>	Thymelaeaceae
##	49	DIG	<i>Digitalis lutea</i>	Plantaginaceae
##	50	<NA>	<i>Dioscorea communis</i>	Dioscoreaceae
##	51	FX	<i>Festuca altissima</i>	Poaceae
##	52	DRY	<i>Dryopteris filix-mas</i>	Dryopteridaceae
##	53	MONT	<i>Epilobium montanum</i>	Onagraceae
##	54	EPI	<i>Epipactis helleborine</i>	Orchidaceae
##	55	<NA>	<i>Epipactis purpurata</i>	Orchidaceae
##	56	EQ	<i>Equisetum ramosissimum</i>	Equisetaceae
##	57	ELA	<i>Euonymus latifolius</i>	Celastraceae
##	58	EU	<i>Euphorbia amygdaloides</i>	Euphorbiaceae
##	59	EDU	<i>Euphorbia dulcis</i>	Euphorbiaceae
##	60	FA	<i>Fagus sylvatica</i>	Fagaceae
##	61	FE	<i>Festuca heterophylla</i>	Poaceae
##	62	FRA	<i>Fragaria vesca</i>	Rosaceae
##	63	FRAX	<i>Fraxinus excelsior</i>	Oleaceae
##	64	GT	<i>Galeopsis tetrahit</i>	Lamiaceae
##	65	APA	<i>Galium aparine</i>	Rubiaceae
##	66	GAR	<i>Galium aristatum</i>	Rubiaceae
##	67	G	<i>Galium odoratum</i>	Rubiaceae
##	68	ROT	<i>Galium rotundifolium</i>	Rubiaceae
##	69	NOD	<i>Geranium nodosum</i>	Geraniaceae
##	70	ROB	<i>Geranium robertianum</i>	Geraniaceae
##	71	HEX	<i>Hedera helix</i>	Araliaceae
##	72	HEL	<i>Helleborus viridis</i>	Ranunculaceae
##	73	HEP	<i>Hepatica nobilis</i>	Ranunculaceae
##	74	<NA>	<i>Hesperis matronalis</i>	Brassicaceae
##	75	H	<i>Hieracium murorum</i>	Asteraceae
##	76	AND	<i>Hypericum androsaemum</i>	Hypericaceae
##	77	<NA>	<i>Hypericum montanum</i>	Hypericaceae
##	78	<NA>	<i>Hypericum perforatum</i>	Hypericaceae
##	79	<NA>	<i>Ilex aquifolium</i>	Aquifoliaceae
##	80	IMP	<i>Impatiens noli-tangere</i>	Balsaminaceae
##	81	ISO	<i>Isopyrum thalictroides</i>	Ranunculaceae
##	82	CORY	<i>Isopyrum thalictroides</i>	Ranunculaceae
##	83	LAB	<i>Laburnum alpinum</i>	Fabaceae
##	84	LAM	<i>Lamium album</i>	Lamiaceae
##	85	<NA>	<i>Lapsana communis</i>	Asteraceae
##	86	LAT	<i>Lathyrus vernus</i>	Fabaceae
##	87	LIL	<i>Lilium martagon</i>	Liliaceae
##	88	LU	<i>Luzula forsteri</i>	Juncaceae
##	89	NIV	<i>Luzula nivea</i>	Juncaceae
##	90	MEL	<i>Melica uniflora</i>	Poaceae
##	91	ME	<i>Mercurialis perennis</i>	Euphorbiaceae
##	92	MIL	<i>Milium effusum</i>	Poaceae

```

##  93 STEX Moehringia trinervia      Caryophyllaceae
##  94 <NA> Monotropa hypopitys    Ericaceae
##  95 MON  Monotropa hypopitys    Ericaceae
##  96 MY   Lactuca muralis       Asteraceae
##  97 <NA> Myosotis decumbens    Boraginaceae
##  98 <NA> Neottia nidus-avis     Orchidaceae
##  99 <NA> Ostrya carpinifolia   Betulaceae
## 100 O   Oxalis acetosella     Oxalidaceae
## 101 <NA> Parietaria officinalis Urticaceae
## 102 POA  Poa nemoralis       Poaceae
## 103 MUL  Polygonatum multiflorum Asparagaceae
## 104 POLY  Polystichum aculeatum  Dryopteridaceae
## 105 SET   Polystichum setiferum  Dryopteridaceae
## 106 PRE   Prenanthes purpurea   Asteraceae
## 107 P   Primula vulgaris      Primulaceae
## 108 PRU  Prunella vulgaris    Lamiaceae
## 109 AVI  Prunus avium       Rosaceae
## 110 PT   Pteridium aquilinum   Dennstaedtiaceae
## 111 QU   Quercus cerris      Fagaceae
## 112 RO   Rosa arvensis      Rosaceae
## 113 RU   Rubus hirtus       Rosaceae
## 114 IDE  Rubus idaeus      Rosaceae
## 115 GLU  Salvia glutinosa   Lamiaceae
## 116 SAM  Sambucus nigra     Viburnaceae
## 117 SAN  Sanicula europaea  Apiaceae
## 118 SAX  Saxifraga rotundifolia Saxifragaceae
## 119 SCRO  Scrophularia nodosa  Scrophulariaceae
## 120 SED  Sedum cepaea      Crassulaceae
## 121 <NA> Sedum monregalense Crassulaceae
## 122 S   Senecio ovatus      Asteraceae
## 123 <NA> Senecio squalidus  Asteraceae
## 124 SIL  Silene dioica      Caryophyllaceae
## 125 SOL  Solanum dulcamara  Solanaceae
## 126 SOV  Solidago virgaurea  Asteraceae
## 127 SOR  Sorbus aria       Rosaceae
## 128 AUC  Sorbus aucuparia  Rosaceae
## 129 STE  Stellaria media    Caryophyllaceae
## 130 NEM  Stellaria nemorum  Caryophyllaceae
## 131 <NA> Thalictrum aquilegiifolium Ranunculaceae
## 132 TIG  Tilia platyphyllos Malvaceae
## 133 <NA> Trifolium repens   Fabaceae
## 134 <NA> Ulmus glabra     Ulmaceae
## 135 U   Urtica dioica     Urticaceae
## 136 VC   Veronica chamaedrys Plantaginaceae
## 137 VE   Veronica montana   Plantaginaceae
## 138 VO   Veronica officinalis Plantaginaceae
## 139 VCR  Vicia cracca     Fabaceae
## 140 VIC  Vicia sepium     Fabaceae
## 141 VA   Viola alba       Violaceae
## 142 V   Viola odorata     Violaceae
## 143 VR   Viola reichenbachiana Violaceae

```

```
write_csv(specieslist, "data/specieslookup_harm.csv")
```

```

# session info -----
sessionInfo()

## R version 4.5.2 (2025-10-31)
## Platform: x86_64-redhat-linux-gnu
## Running under: Nobara Linux 43 (KDE Plasma Desktop Edition)
##
## Matrix products: default
## BLAS/LAPACK: FlexiBLAS OPENBLAS-OPENMP; LAPACK version 3.12.1
##
## locale:
## [1] LC_CTYPE=it_IT.UTF-8      LC_NUMERIC=C
## [3] LC_TIME=it_IT.utf8       LC_COLLATE=it_IT.UTF-8
## [5] LC_MONETARY=it_IT.utf8   LC_MESSAGES=it_IT.UTF-8
## [7] LC_PAPER=it_IT.utf8      LC_NAME=C
## [9] LC_ADDRESS=C              LC_TELEPHONE=C
## [11] LC_MEASUREMENT=it_IT.utf8 LC_IDENTIFICATION=C
##
## time zone: Europe/Rome
## tzcode source: system (glibc)
##
## attached base packages:
## [1] stats      graphics   grDevices datasets  utils      methods    base
##
## other attached packages:
## [1] readxl_1.4.5    lubridate_1.9.4 forcats_1.0.1  stringr_1.6.0
## [5] dplyr_1.1.4     purrrr_1.2.0    readr_2.1.6    tidyrr_1.3.2
## [9] tibble_3.3.0    ggplot2_4.0.1   tidyverse_2.0.0
##
## loaded via a namespace (and not attached):
## [1] bit_4.6.0        gtable_0.3.6    crayon_1.5.3   compiler_4.5.2
## [5] tidyselect_1.2.1  parallel_4.5.2  scales_1.4.0    yaml_2.3.12
## [9] fastmap_1.2.0    R6_2.6.1       generics_0.1.4  knitr_1.50
## [13] pillar_1.11.1   RColorBrewer_1.1-3 tzdb_0.5.0    rlang_1.1.6
## [17] utf8_1.2.6      stringi_1.8.7   xfun_0.55     S7_0.2.1
## [21] bit64_4.6.0-1   timechange_0.3.0 cli_3.6.5     withr_3.0.2
## [25] magrittr_2.0.4   digest_0.6.39   grid_4.5.2    vroom_1.6.7
## [29] rstudioapi_0.17.1 CoprManager_0.5.7 hms_1.1.4     lifecycle_1.0.4
## [33] vctrs_0.6.5     evaluate_1.0.5  glue_1.8.0    cellranger_1.1.0
## [37] farver_2.1.2    rmarkdown_2.30   tools_4.5.2   pkgconfig_2.0.3
## [41] htmltools_0.5.9

```