State of the World's Plants 2017

Useful Plants- medicines

Counting medicinal species

The State of the Worlds Plants 2017 analysis of medicinal species is based upon data held in the Medicinal Plant Names Services (MPNS) Resource http://mpns.kew.org/mpns-portal/

This is a summary of the methodology employed to analyse that data for SOTWP 2017.

Since all names employed in the MPNS Resource are mapped to Kew's taxonomic indexes MPNS links all records of each plant regardless of the diverse names employed in the original medicinal publication. This enables us to provide a robust count of the medicinal species for which MPNS has gathered evidence. MPNS also provides the means to enable further breakdown by geographical region and by type of publication (see following sections).

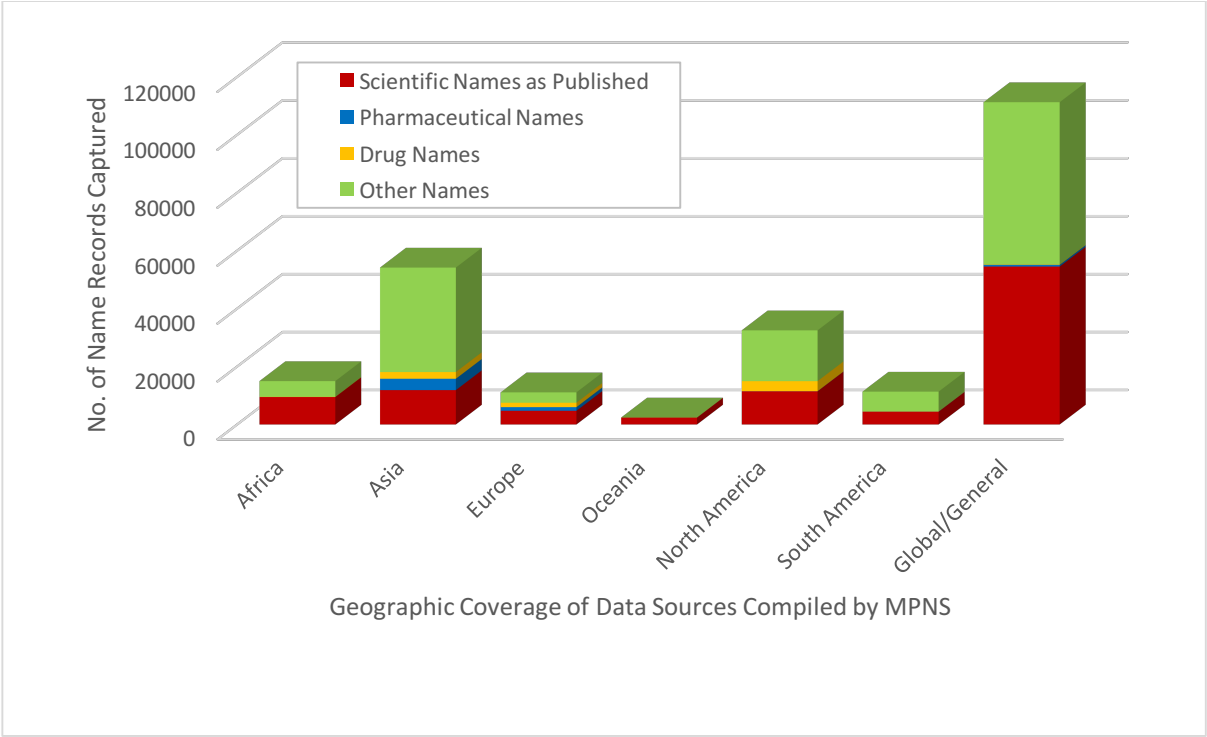
As one further step for SOTWP 2017, all plants were mapped to Catalogue of Life (CoL) to obtain corresponding CoL families so as to be consistent with other chapters of the SOTWP 2017 report. These CoL family mappings were used to demonstrate the distribution of medicinal species across families (see 'Which Plant Families are Richest in Species of Medicinal Use?'; Fig. 4).

Geographic coverage of plant names

Each reference held within the MPNS Resource was mapped to a geographical region based on area of focus or intended use and according to the United Nations geoscheme.

This permits analysis of the regional coverage of each names class held within the Resource (see Fig. 1 below).

Fig 1. Geographic coverage of data sources compiled by MPNS



Breakdown of publication types in the MPNS Resource

MPNS also provides the means to report on the types of publications captured (based upon a pre-established set of categories used to "classify" each reference according to its purpose and domain).

Brief definitions of the classes identified and the number of sources captured and species cited for each are given below. A reference included in MPNS may have been assigned to more than one category. More detailed explanation of how these groupings were derived are available on request.

Fig 2. Class/purpose of data sources included in the SOTWP 2017 analysis

Class/Purpose of data sources included (Individual data sources may map to more than one class)	**Sources consulted**	**No. of species they cite**
Regulatory *official pharmacopoeias and related publications, pharmaceutical monographs, standards and other Regulatory affiliated resources incl. regulatory databases*	54	4,478

Trade *trade standards, reports covering large-scale medicinal plant trade, ethnobotanical and regional trade/market surveys*	13	2,977
Natural Products *pharmaceutical monographs, journal articles and broader lists, reviews and datasets about chemical investigations and screening of plants for active constituents*	50	13,371
Ethnobotanical Research *journal articles and more comprehensive publications containing primary ethnobotanical research*	25	2,975
Conservation *conservation regulation, journal articles and conservation reports*	7	618
Reviews & General Monographs *non-pharmaceutical monographs, databases and reviews*	37	12,466
Medicinal Plant Checklists & Summaries *checklists, summaries and inventories listing medicinal plants with little or no additional information*	18	19,891
Total number of unique data sources/species	143	28,187

This breakdown illustrates the strength of the MPNS Resource (in terms of regulatory data for example), and its relative weaknesses with regard ethnobotanical and conservation resources.

Which plant families are richest in medicinally useful species?

The graph below presents the data underlying the SOTWP 2017 Useful Plants chapter to show the numbers of species known to have medicinal use and their distribution across all plant families. It represents an analysis of the 28,187 species recorded by MPNS as having medicinal use.

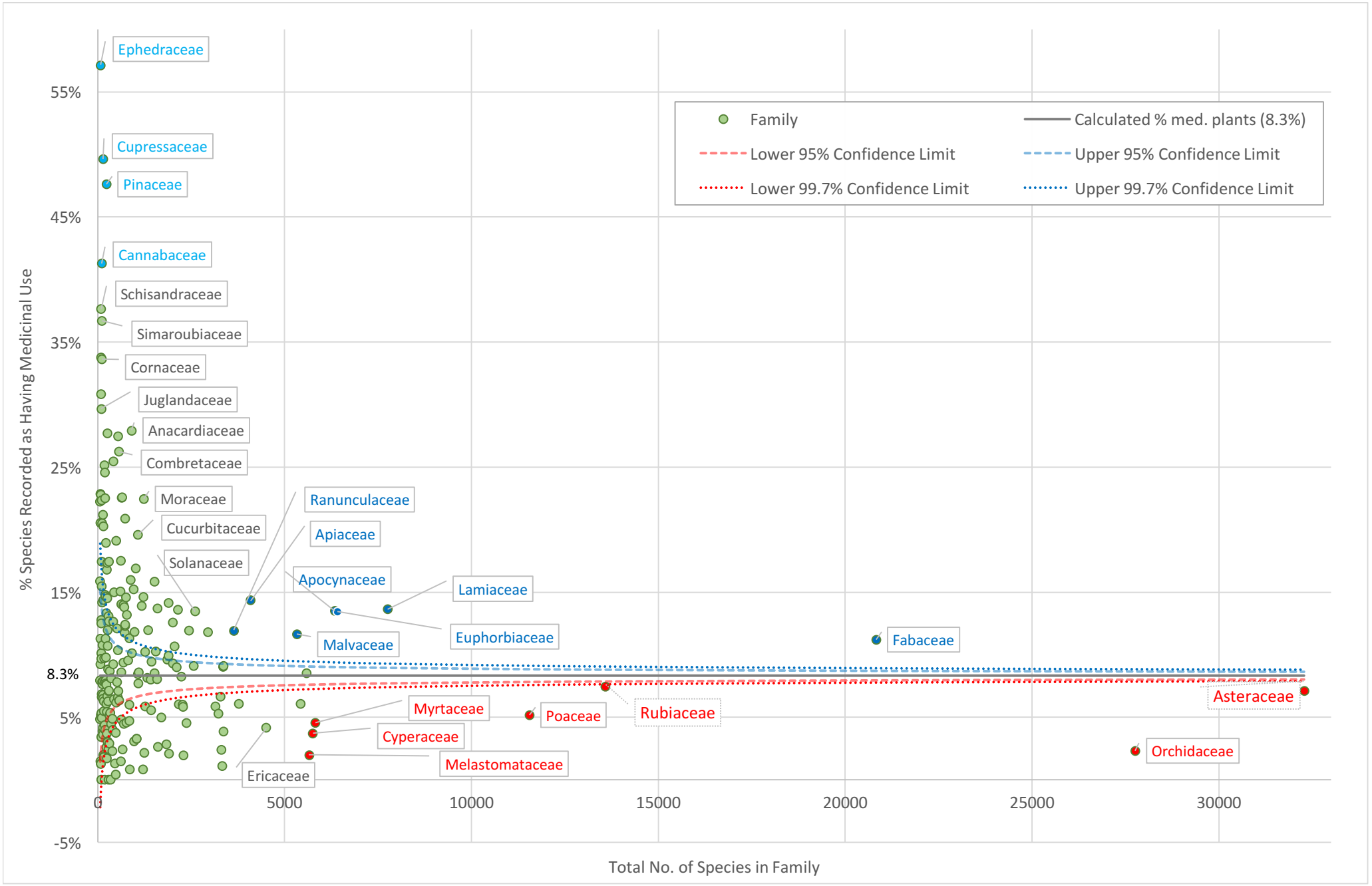
Each point on the graph denotes a plant family, plotted according to:

- *the **total no of species in the family (X axis),** i.e. larger families appear further to the right*
- *the **% species recorded by MPNS as having a medicinal use** (**Y axis**), i.e. families containing a higher proportion of medicinal species appear higher up the graph.*

In the graph (Figure 3):

1) The grey horizontal line represents the percentage of ALL species recorded which also have a medicinal use recorded, regardless of family. This value was found to be 8.3% for this dataset. Thus we would expect this same proportion of medicinal species in any one family were medicinal plants distributed evenly across all families. This proved not to be the case.
2) Plant families with a relatively **high** proportion of medicinal species appear above the **blue** dotted line (confidence limits ·····> 95%; OR –. –. –>97.5%). Examples of large, medicinally rich families are denoted in blue on the graph and include: Fabaceae, Lamiaceae, Euphorbiaceae, Apocynaceae, Malvaceae, Apiaceae and Ranunculaceae.
3) Plant families with a relatively **low** proportion of medicinal species appear below the **red** dotted line (confidence limits ·····> 95%; OR –. –. –>97.5%). Examples of large, medicinally poor families are denoted in red on the graph and include: Asteraceae, Orchidaceae, Rubiaceae, Poaceae, Myrtaceae, Cyperaceae and Melastomataceae.
4) A number of small families containing a particularly high proportion of medicinal species include: Ephedraceae, Cupressaceae, Pinaceae and Cannabaceae. They have been indicated in a brighter blue on the graph.

Fig 3. Which plant families are richest in species of medicinal use?



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