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APPENDIX A

Scientific Names of Plants and Animals Used in Text\*  
(Listed in alphabetical order of common name)

Names of two ducks are used in the text in a special manner. When only the term scaup is used, both greater and lesser scaup are referred to, although the latter make up the larger proportion of the ducks involved. Where the name common goldeneye appears, it must be recognized that a few Barrow's goldeneye may be included. This is especially true when considering migrant and wintering populations. However, since the Barrow's goldeneye is encountered infrequently in Wisconsin, the numbers included would be extremely small.

PLANTS		ANIMALS	
Alder	<i>Alnus</i> spp.	Beaver	<i>Castor canadensis</i>
Alfalfa	<i>Medicago</i> spp.	Blood parasites	<i>Leucocytozoon</i> spp.
Ash, black	<i>Fraxinus nigra</i>		<i>Hemaphysalis</i> spp.
Barley	<i>Hordeum</i> spp.	Bufflehead	<i>Filula</i> spp., <i>Platanidium</i> spp.
Beggar-ticks	<i>Bidens</i> spp.	Canvasback	<i>Aythya vallisneria</i>
Birch	<i>Betula</i> spp.	Carp	<i>Cyprinus carpio</i>
Buckwheat	<i>Polygonum</i> spp.	Coot, American	<i>Fulica americana</i>
Bulrush	<i>Scirpus</i> spp.	Crow, common	<i>Corvus brachyrhynchos</i>
Burreed	<i>Sparganium</i> spp.	Duck, black	<i>Anas rubripes</i>
Cattail	<i>Typha</i> spp.	Duck, ring-necked	<i>Aythya collaris</i>
Cedar, White	<i>Thuja occidentalis</i>	Duck, ruddy	<i>Oxyura jamaicensis rubida</i>
Coontail	<i>Ceratophyllum</i> spp.	Duck, wood	<i>Aix sponsa</i>
Cordgrass	<i>Spartina pectinata</i>	Gadwall	<i>Anas strepera</i>
Corn	<i>Zea Mays</i>	Gizzard worms	<i>Amidostomum</i> spp.
Cottongrass	<i>Eriophorum</i> spp.	Goldeneye, common (American)	<i>Bucephala clangula americana</i>
Dock	<i>Rumex</i> spp.	Goldeneye, Barrow's	<i>Bucephala islandica</i>
Dogwood	<i>Cornus</i> spp.	Grouse, ruffed	<i>Bonasa umbellus</i>
Duckweed	<i>Lemna</i> spp.	Mallard	<i>Anas p. platyrhynchos</i>
Elm	<i>Ulmus</i> spp.	Merganser, common (American)	<i>Mergus merganser americanus</i>
Grass, reed canary	<i>Phalaris arundinacea</i>	Merganser, hooded	<i>Lophodytes cucullatus</i>
Grass, wool	<i>Scirpus</i> spp.	Merganser, red-breasted	<i>Mergus serrator</i>
Leatherleaf	<i>Chamaedaphne calyculata</i>	Mink	<i>Mustela vison</i>
Maple, Silver	<i>Acer saccharinum</i>	Muskrat	<i>Ondatra zibethica</i>
Meadowsweet	<i>Spiraea</i> spp.	Old-squaw	<i>Clangula hyemalis</i>
Millet	<i>Echinochloa</i> spp.	Opossum	<i>Didelphis virginiana</i>
Oak	<i>Quercus</i> spp.	Pheasant, ring-necked	<i>Phasianus colibitica</i>
Oats	<i>Avena</i> spp.	Pike, northern	<i>Esox lucius</i>
Pine, jack	<i>Pinus banksiana</i>	Pintail	<i>Anas acuta</i>
Pondweed, flat-stemmed	<i>Potamogeton zosteriformis</i>	Raccoon	<i>Procyon lotor</i>
Pondweed, floating-leaf	<i>Potamogeton nodosus</i>	Redhead	<i>Aythya americana</i>
Pondweed, leafy	<i>Potamogeton foliosus</i>	Scaup, greater	<i>Aythya marila</i>
Pondweed, sago	<i>Potamogeton pectinatus</i>	Scaup, lesser	<i>Aythya affinis</i>
Rice, wild	<i>Zizania aquatica</i>	Scoter, common (American)	<i>Oidemia nigra americana</i>
Rye	<i>Secale</i> spp.	Scoter, white-winged	<i>Melanitta deglandi</i>
Sedge	Family Cyperaceae	Shoveler	<i>Spatula clypeata</i>
Smartweed	<i>Polygonum</i> spp.	Skunk	<i>Mephitis mephitis</i>
Spruce, black	<i>Picea mariana</i>	Teal, blue-winged	<i>Anas discors</i>
		Teal, green-winged	<i>Anas carolinensis</i>
		Widgeon, American (baldpate)	<i>Marca americana</i>

\* Scientific names of plants and animals are from the following references: plants—Fensholt (1940) and Fernald (1950); mammals—Burt and Grossenheider (1952); fishes—Hubbs and Lagler (1947); birds—American Ornithologists' Union (1957).

The binomial nomenclatures of common plants are listed as follows:

Common Name	Scientific Names
Sunflower	<i>Helianthus annuus</i>
Mango	<i>Mangifera indica</i>
Neem	<i>Azadirachta indica</i>
Rose	<i>Rosa</i>
Tulsi	<i>Ocimum tenuiflorum</i>
Apache Plume	<i>Fallugia paradoxa</i>
Aplle Blossom Grass	<i>Gaura</i>
Wild rye	<i>Elymus sp.</i>
Wild Oats	<i>Avena fatua</i>
Red Maple	<i>Acer rubrum</i>
Rice	<i>Oryza sativa</i>
Wheat	<i>Triticum spp.</i>
Finger millet	<i>Eleusine coracana</i>
Barley	<i>Hordeum vulgare</i>
Coriander	<i>Coriandrum sativum</i>
Cashew nut	<i>Anacardium occidentale</i>
Curry leaf	<i>Murraya koenigii</i>
Dragon fruit	<i>Hylocereus undatus</i>
Ginger	<i>Asarum</i>
Orange	<i>Citrus sinensis</i>
Papaya	<i>Carica papaya</i>
Pine apple	<i>Ananas comosus</i>
Cinnamon	<i>Cinnamomum zeylanicum</i>

Scientific Names - Fruits and Vegetables :

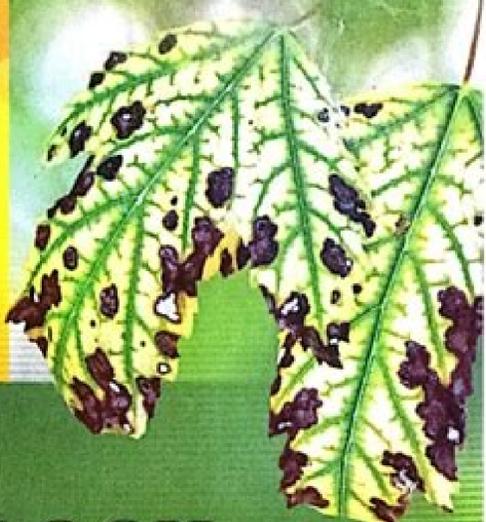
Vegetables		Fruits	
Scientific Name	Common Name	Scientific Name	Common Name
<i>Allium cepa</i>	Onion	<i>Mangifera indica</i>	Mango
<i>Solanum tuberosum</i>	Potato	<i>Pyrus malus</i>	Apple
<i>Cucumis sativas</i>	Cucumber	<i>Citrullus vulgaris</i>	Watermelon
<i>Lactuca sativa</i>	Lettuce	<i>Citrus Limonium</i>	Lemon
<i>Daucas carota</i>	Carrot	<i>Citrus aurantium</i>	Orange



Please be aware that the coloured flowers will fade over a 6-8 week period for Guzmanias, Tillandsias, Phalaenopsis and Vriisia.



R. P. Singh  
Mamta Singh  
Smita Puri



# PLANT PATHOLOGY AT A GLANCE

For ICAR's Exams, AIEEA-PG  
JRF, SRF, NET, ARS, IARI  
Ph.D, SAU's, UPSC and Allied  
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Plant botanical names. List of plants and their botanical name. List 20 botanical name of plants. Types of botanical plants. List of medicinal plants with botanical name. Botanical list of plants.

From Aloe to Zebra Grass—and with over 1,000 plants to explore—find every plant in the alphabet within our comprehensive A to Z index.

GENERAL PLANT LIST (sorted by botanical name [A-B]) (101 different plants) To add plants to your garden quickly login or register. A B C D E F G H I J K L M N O P Q R S T U V W X Y Z 1 to 50 of 2809 results >> 1 to 50 of 2809 results >> Enter a Genus (eg *Ocimum*) or genus and species (eg *Ocimum basilicum*). ? will match a single character. \* will match any number of characters. Use at least three letters in the genus name if you include a ? or \*. Δ The Plant List (TPL) was a working list of all known plant species produced by the botanical community in response to Target 1 of the 2002-2010 Global Strategy for Plant Conservation (GSPC). TPL has been static since 2013, but was used as the starting point for the Taxonomic Backbone of the World Flora Online (WFO), and updated information can be found at [www.worldfloraonline.org](http://www.worldfloraonline.org). WFO is being developed by a consortium of leading botanical institutions worldwide in response to the 2011-2020 GSPC's updated Target 1, to achieve an online Flora of all known plants by 2020. WFO welcomes feedback from users for improvements to its Taxonomic Backbone which is curated by a growing community of WFO Taxonomic Expert Networks (TENs). The Plant List was a working list of all known plant species that aimed to be comprehensive for species of Vascular plant (flowering plants, conifers, ferns and their allies) and of Bryophytes (mosses and liverworts). Collaboration between the Royal Botanic Gardens, Kew and Missouri Botanical Garden enabled the creation of The Plant List by combining multiple checklist data sets held by these institutions and other collaborators. Version 1.1 (September 2013) replaced Version 1.0 which remained accessible here. Version 1.1 includes new data sets, updated versions of the original data sets and improved algorithms to resolve logical conflicts between those data sets. The differences between versions are summarised here. The Plant List provides the Accepted Latin name for most species, with links to all Synonyms by which that species has been known. Around 20% of names are unresolved indicating that the data sources included provided no evidence or view as to whether the name should be treated as accepted or not, or there were conflicting opinions that could not be readily resolved. The Plant List is not perfect and represents work in progress. Our aims remain to produce a 'best effort' list, to demonstrate progress and to stimulate further work. Important limitations are summarised here. The Plant List includes 1,064,035 scientific plant names of species rank. Of these 350,699 are accepted species names. The Plant List contains 642 plant families and 17,020 plant genera. The status of the 1,064,035 species names, are as follows: Page 2 How to use this site The Search function will locate scientific plant names stored within The Plant List (Scope). You may retrieve either a single species name OR a set of species names which match your search string. You may search using the name of a genus alone OR using a binomial (a genus and species combination). You may search using wild characters in your search strings: using a "?" for any single character and a "\*" for any string of characters. You may also search for a single family. The Search function will NOT retrieve names using search strings including infraspecific names species names with their publishing authors search strings with less than three characters long when using wild characters in your search The Search function will not retrieve names not within the Scope of The Plant List. Algae or other excluded groups Vernacular or Common names The Search function will not enable you to obtain statistics about a particular Genus or Family nor see lists of Species names. To achieve these goals please refer to How to Browse The Plant List. For any particular plant name the Search function therefore enables you to: validate the spelling of that name and to find names that are spelt similarly. find out the currently Accepted (botanically preferred) name for that name. discover all recorded Synonyms of that name. obtain more detailed information about that plant name and the plant for which it is used. The Plant List was built by bringing together data records from various Checklist Data Sources. This resource was then complemented by the inclusion of any additional names found in IPNI (the International Plant Name Index) (for Angiosperms, Gymnosperms and Fern & Fern Allies) or in the Missouri Botanical Garden's Tropicos system (e.g. for Mosses & Bryophytes). If you are unable to find a plant name in The Plant List therefore you should first check that you are spelling it correctly. Each of the databases used to build The Plant List will have added plant names in the months since they passed us their data. These would be included in future versions. We would nevertheless appreciate hearing of plant names that you consider to be missing from The Plant List. When not to use Search The Search function will not retrieve names using search strings including infraspecific names species names with their publishing authors search strings with less than three characters long when using wild characters in your search The Search function will not retrieve names not within the Scope of The Plant List: Algae or other excluded groups Vernacular or Common names The Search function will not enable you to obtain statistics about a particular Genus or Family nor see lists of Species names. To achieve these goals please refer to How to Browse The Plant List. The search box can be found on the home page and at the top right hand corner of other screens. Submit your search string Enter a Genus (eg *Ocimum*) or genus and species (eg *Ocimum basilicum*). ? will match a single character. \* will match any number of characters. Use at least three letters in the genus name if you include a ? or \*. As you type characters into the search box, you will be prompted with lists of names that match your search string Prompting with generic names as you enter the first word Prompting with binomials once a unique genus name has been entered If you submit a two word search string that does not retrieve any records then the Search facility will retrieve any names that match the Genus name you submitted Examples of searches that will work Use *Vicia faba* to locate this name (and any infraspecific names associated with it). Use *Schusterella* to locate all names in this genus. Use *Taxaceae* to see the *Taxaceae* family page. Use *Quercus a\** to locate all names in the genus *Quercus* that have a species name beginning with the letter 'a'. Use *Psilo\** to locate all names in any genera which begin with the letters "Psilo". Use *Orcnis a????* to locate all names in the genus *Orcnis* which have a species name of exactly six letters, the first of which is the letter 'a'. Use *M?cro\** to locate all names in any genera whose names begin with 'Micro' or 'Macro'. Examples of searches that will not work *La\** is not a valid search string, since at least three letters are required when a ? or \* in the genus. Neither 'ubus nor 'ubus are valid search strings since each begins with a wildcard. Using *Vicia sativa var. sativa* will return all names that would be found using *Vicia sativa* rather than just those infraspecific names matching the full string. Limitations when Searching The Plant List The Plant List aims to have complete coverage of the species names for the plant groups included. (Scope) The Plant List does not aim to have complete coverage of: infraspecific scientific plant names misspelt versions of names used in the literature (spelling variations) records of how a scientific plant name has been misused to refer to a species erroneously (misapplied names) How to use the Results Page When one or more names are found that match the name of the Genus (and of the Family) are to be found i) immediately underneath the name of the Species and ii) within the Breadcrumbs at the top of the page From the Browse Genus page click on the name of the Family to which this Genus belongs to see all other Genera in this Family or click on the name of the Higher Group to which this Family belongs to see all Families in this Higher Group. Please note that the name of the Family (and of the Higher Group) are to be found i) immediately underneath the name of the Genus and ii) within the Breadcrumbs at the top of the page From the Browse Family page click on the name of the Higher Group to which this Family belongs to see all other Families in this Higher Group. Please note that the name of the Higher Group is to be found i) immediately underneath the name of the Family and ii) within the Breadcrumbs at the top of the page From any Browse page you can always return to the top of the taxonomic tree by clicking on The Plant List at the start of the breadcrumbs at the top of any page. Browsing by Family Move to the Main Browse Page by selecting the BROWSE menu option Above the list of Major Groups you will find the opportunity to browse The Plant List by Major Group, by Family or by Genus. Click on the option to Browse by Family You will see a list of all families included within The Plant List. Browsing by Genus Move to the Main Browse Page by selecting the BROWSE menu option Above the list of Major Groups you will find the opportunity to browse The Plant List by Major Group, by Family or by Genus. Click on the option to Browse by Genus You will see a list of all accepted genera included within The Plant List. Finding out more about a Family If you know to which Higher Plant Group a Family belongs you can browse within that Major Group If you do not know to which Higher Plant Group a Family belongs then choose to Browse by Family and then select the Family of interest. You will retrieve statistics associated with this Family and be able to browse a list of Genera which belong to it. A Genus If you know to which
Higher Plant Group and Family your Genus belongs then you can sue use the Browse options to descend the taxonomic tree If you do not know to which Family your Genus belongs then you can choose to Browse by Genus and then select the Genus of interest. You will retrieve statistics associated with this Genus and be able to browse a list of Species which belong to it. A Species You can locate a Species within The Plant List either by typing its name into the Search facility OR (if you know which Family or Genus it belongs to) by using the Browse feature. Each Accepted Name page contains a set of standard information for each Species contained You can locate a particular plant name contained within The Plant List by using the Search or Browse features. The Browse feature will only enable you to detect plant names that are considered to be Accepted or Unassessed for a given species. You can see detailed information for a particular plant name by either Nomenclatural details for individual names Each individual Name page within The Plant List will provide you with the following information: For all name pages The name string including the publishing author The Status of that name record (Accepted; Synonym; Unresolved or Missapplied) The Confidence level with which this status was assigned during the creation of The Plant List Any further indication should this name be Illegitimate, Invalid or a Spelling Variant (where this information was provided by the database from which this record was derived) The name of the Source database which supplied this name record A direct link to this record within the Source database online — to facilitate access to any additional information that they may hold. Please note that direct links are only available for those datasets which are visible online. Details of where this name was published derived from the Source database (where this information was supplied). A direct link to the IPNI database record for this name which will provide full publication details. Links to IPNI appear a) where we were able to confidently (unambiguously) match that name against the IPNI database and b) only for name records other than Missapplied names) For accepted name pages only The Genus to which this Species belongs The Family to which this Species belongs The Higher Plant Group to which this Species belongs A list of all known Synonyms of this name with their Source, Status and Confidence level For synonym pages only The Accepted name pages only The Accepted name pages only The name of the plant to which this name has been erroneously applied in the past Details of where this misuse of the name has been published or recorded (where such information was derived from the Source database). If this information is not present on this page then follow the link to the Source database online. Accepted name pages and Unresolved name pages also provide links to additional information about these plants stored within online databases that are held and managed by other institutions and projects. These resources include: Other checklists or Floras Specimen and Herbarium databases Molecular, DNA and Chemical databases More General resources including Bibliographic databases, Image libraries and our own broader institutional resources. To seek further information please use as many of the buttons provided as you wish. You may need to use your browser's 'Back' button to return to this page. There are two options for downloading a set of name records from The Plant List: a set of names resulting from a search names for a given family Both options result in a set of data records in Comma-Separated Values format (CSV) for ease of use in spreadsheets or databases. CSV files are provided in Unicode UTF-8 encoding with an initial byte order mark. Downloading a search result Once you have completed a successful search of The Plant List the results will be displayed on the Results page (see How to Search The Plant List).At the top of the Results page is a link enabling you to download the results viewed on this page in CSV format. All records satisfying the search criteria that you used will be included. For each record the data set will include all the data fields presented along with the source of that data record and the taxonomic status of this record recorded in that database as well as the final status within The Plant List. The format of the download is described below. Downloading all names by family Use the Browse function with The Plant List and find the Family Browse page in which you are interested. See How to Browse The Plant List. Towards the top of the Family Browse Page and immediately above the Statistics you will find a link enabling you to Download accepted names in this family. All name records in The Plant List for this family which have a status of 'Accepted' will be included within your download. For each record the data set will include all the data fields presented along with the source of that data record and the taxonomic status of this record recorded in that database as well as the final status within The Plant List. The download format The CSV file has these columns: Field Name Description ID The unique identifier within The Plant List Major group The Major Plant Group to which this plant belongs Family The Family to which this plant belongs Genus hybrid marker Genus Genus name Species hybrid marker Species Species name Infraspecific name Rank for infraspecific names Infraspecific epithet Infraspecific name Authorship Publishing Author(s) Taxonomic status in The Plant List Nomenclatural status from original data source Confidence assigned to the Status within The Plant List Source Original source of this record Source id Unique identifier within the original source database\* IPNI id Unique identifier within IPNI Publication Original Name Publication details Collation Original Name Publication collation details Page Original Name Publication page number(s) Date Original Name Publication date \* Please note that the source identifier is only provided for those datasets which are available online. 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A global view of the botanically accepted name for a plant and all of its alternative synonyms. Since the ability to plan the sustainable use of plants, essential resources for food, medicines, and ecosystem services depends on effective retrieval of information about plants there is a broad constituency of potential users of The Plant List. The Plant List is a working list of known plant species, which each plant group is comprehensive in coverage at species level for all names of mosses and liverworts and vascular plants (Bryophytes and Vascular plants which include the flowering plants (Angiosperms), conifers, cycads and their allies (Gymnosperms) and the ferns and their allies including horsetails and club mosses (Pteridophytes). For each name at species level we aim to provide the author of the name, the original place of publication and an assessment of whether the name is accepted or is a synonym for another name from data resources held by Kew, by Missouri Botanical Garden and by our collaborators. Wherever possible for each name included links are also provided to the original online database record, to its corresponding entry in IPNI and to further sources of information about that plant. The names of some subspecies or varieties of plant are also included in The Plant List primarily where they are synonyms or accepted names for species names and where they were available from the contributing data sets. The Plant List does not aspire to comprehensive coverage of infraspecific taxa (subspecies, varieties, forms etc.). What does The Plant List not contain? Version 1.1 of The Plant List does not contain: scientific names for fossil plants, algae or fungi; common (or vernacular) names for the plants included; the geographic distribution or any other data about the plants included (though such data may be obtained from the source databases in many instances). The Plant List includes all known species of the following major plant groups: Angiosperms Gymnosperms Pteridophytes Bryophytes Genera and species are presented in families which follow the source database(s) except in the case of Angiosperms where we have, wherever possible allocated accepted genera to the families recognised by the Angiosperm Phylogeny Group. Angiosperms Angiosperms (Subclass Magnoliidae Novák ex Takht.). Subclass level classification follows Chase, M.W. & Reveal, J.L., 2009. A phylogenetic classification of the land plants to accompany APG III. Botanical Journal of the Linnean Society, 161, 122–127. Genera and species of Angiosperms are presented in families following family circumscriptions in The Angiosperm Phylogeny Group, 2009. An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG III. Botanical Journal of the Linnean Society, 161, 105–121. Within the Angiosperms, data quality varies widely reflecting the patchiness of the taxonomic and geographic coverage of the source databases. Coverage is believed to be most comprehensive and consistent for Monocotyledon, where The Plant List benefited from the existence of comprehensive checklists fully reviewed by experts (see WSCP and GrassBase). For Angiosperms other than Monocotyledons, expert-reviewed lists of similar quality provide comprehensive and consistent coverage for certain major families. Otherwise coverage is more patchy and likely to be less consistent as the name records have been assembled from regional lists and/or other sources not fully reviewed by specialist systematists. Coverage is probably least reliable for areas for which regional lists were not available for incorporation, especially for South East Asia, and for genera with names ending with the letters H-Z (as genera beginning with the letters A-G benefited from earlier compilation effort as part of development of the World Checklist of Selected Plant Families). Gymnosperms Gymnosperms — Conifers, Cycads, Ephedras, Gnemtum, Ginkgo and Welwitschia (including Subclass Ginkgooidae Engl; Subclass Cycadidae Pax, Subclass Pinidae Cronquist, Takht. & Zimmerm.; Subclass Gnetaidae Pax following Chase and Reveal, 2009) Gymnosperms records derive primarily from WCPSP and incorporate the 2001 World Checklist of Conifers by A.Farjon. Coverage is thought to be comprehensive. Pteridophytes Pteridophytes — ferns, horsetails and club mosses (including Subclass Equisetidae Wurm; Subclass Marattiidae Kluge; Subclass Ophioglossidae Klinge; Subclass Polypodiidae Cronquist, Takht. & Zimmerm.; Subclass Psilotidae Reveal; Subclass Lycopodiidae Beketov.) No peer-reviewed global list of any family of ferns or other Pteridophyte has been incorporated. The data presented are compiled from regional and nomenclatural sources not reviewed by experts and are therefore likely to be less comprehensive and consistent than those for Angiosperms and Gymnosperms. Bryophytes Bryophytes — mosses, liverworts and hornworts (including Subclass Anthocerotidae Engl.; Subclass Bryidae Engl; Subclass Marchantiidae Engl.) Nomenclatural coverage The Plant List aims to provide all the scientific names for species for these plant groups. A breakdown of the numbers of plants and names included in each plant group is provided, see Statistics. Coverage of infraspecific taxa (subspecies, varieties, forms etc) is not comprehensive; they are included, primarily where they are synonyms or accepted names for species names. Coverage and data quality are primarily influenced by the source data sets used to build The Plant List. We are aware of additional data sets which, had they been included, would have enriched and improved the final product. We hope to include such data sets in later releases. The Status of name records Each name record included within The Plant List is assigned one of the statuses listed below. The Status of each name is derived primarily from the data source from which that name record comes (see Derivation of Name Status). The decision, for example, that one name is the accepted name of a given plant is based upon a taxonomic opinion recorded within the cited data source. Such decisions were automated using a rules-based approach which, where necessary, selected from among alternative taxonomic opinions expressed, within or between different data sources. For an explanation of how these decisions were reached see How The Plant List was Created. Accepted Name This is the name which should be used to refer to the species (or to a subspecies, variety or forma). For each name with Status of 'Accepted' The Plant List aims to provide: the name currently accepted as the one which should be used in preference to refer to this species (or subspecies, variety or forma); the author(s) credited with publishing that name; the place and date of original publication of the name where this was supplied; a reference to the source database supplying this name record that recorded the opinion that it is an accepted name (with, where possible, a link to that record in the source database); other names (synonyms) considered to refer to that species; the IPNI identifier (linking the name record to the International Plant Names Index, a bibliographic resource which will provide full original publication details for this name); an assessment of the Confidence that The Plant List attaches to the name being accepted. (This is an indication of the confidence that the Status of the name is correct). Synonym A Synonym is an alternative name which has been used to refer to a species (or to a subspecies, variety or forma) but which The Plant List does not consider to be the currently Accepted name. The decision to assign the Status of Synonym to a name record is based upon a taxonomic opinion recorded in the cited data source (selected using automated rules-based approach; see How The Plant List was Created). Synonymy can be derived directly from the source data (showing identical data as the source data) or can be derived indirectly using the automated decision rules (e.g. if source 1 says that A is a synonym of B and source 2 says that B is a synonym of C, then The Plant List will show A to be a synonym of C). For each name with Status of Synonym The Plant List aims to provide: the name; the author(s) credited with publishing that name; the place and date of original publication of the name where this was supplied; a link to its Accepted name; a reference to the source database supplying this name record and expressing the opinion that it is a Synonym (with, where possible, a link to that record in the source database); the IPNI identifier (linking the name record to the International Plant Names Index, a bibliographic resource which will provide full original publication details for this name); an assessment of the Confidence that The Plant List attaches to the Status of the name being Synonym. Unresolved Name Unresolved names are those to which it is not yet possible to assign a Status of either 'Accepted' or 'Synonym'. For an explanation of how names were assigned a status please refer to How The Plant List was Created. Unresolved names fall into two sub-classes: Unassessed names for which there is no evidence within any of the contributing data sources that the status of this name had been evaluated by the data owners. None had recorded that it was either 'accepted' or a 'synonym'. None had recorded that they had attempted such an evaluation. Since, by definition, a name is accepted by the publishing author at the time of publication, it could be argued that all names are putatively Accepted until such time as they are demonstrated to be Synonyms. Unplaced names for which the data source supplying that record indicated positively that the data owners had sought to resolve its status and not been able to come to a conclusion so as to place it either in synonymy or as the accepted name of a new species. This is often the case if the name has insufficient description and no herbarium specimens are known or where one or more nomenclatural acts are required to provide the accepted name for which the unplaced name would be a synonym. Among Unresolved names, Unassessed names are much more numerous than Unplaced names. It is also important to note that in a small number of cases the status 'Unresolved' was assigned to a name record during creation of The Plant List despite a taxonomic opinion having been recorded in the contributing data source. This occurs where to have followed this opinion would have conflicted with opinions recorded elsewhere in other data sources. To follow both would have resulted in inconsistencies within the working list of plants. In such cases: the status of the record on this website is indicated with an "\*" to indicate that it derives from the procedures used to build The Plant List and the original status of the name (as recorded in the source database) is indicated on the details page for that name. For each name with Status of 'Unresolved' The Plant List aims to provide: the name; the author(s) credited with publishing that name the place and date of original publication of the name where this was supplied; a reference crediting the source database providing the name; (with, where possible, a link to that record in the source database) the IPNI identifier (linking the name record to the International Plant Names Index which will provide full original publication details for this name); Unresolved names are generally flagged as 'Low Confidence' entries. Misapplied Names Some data sets which contributed to The Plant List record not only how plant names should be used but also where in the published literature a given name may previously have been used inappropriately (to refer erroneously to another species). Recording such misapplication of names helps users to avoid pitfalls when interpreting the literature. The decision that a record represents the misuse of a name is derived from the cited data source (see How The Plant List was Created.) For each reported misapplication of a plant name we aim to provide: the name; the author(s) that published that name and wherever possible an indication of where or by whom this name was misused (e.g. 'sensu Smith' may appear after the publishing author); a link to the Accepted name of the species to which this name has been previously and erroneously applied; a reference crediting the source database recording this misuse of the name; (with a link to that record in the source database and hence the publication details of where this name was misapplied) an assessment of the Confidence that The Plant List attaches to this name having been erroneously applied to another species. Annotation of names supplied which contributed name records The Plant List record included, on relatively few occasions, additional information about individual names beyond their status as Accepted or Synonym. Where possible this information is retained within The Plant List and made visible to users as annotations attached to the relevant name record. Invalid and Illegitimate Names Some of the names in The Plant List were recorded by the contributing data sets to be either invalidly or illegitimately published according to the rules of the International Code of Botanical Nomenclature. Spelling variants (or Orthographic variants) Some data sources include names which are recorded as 'Orthographic variants' (or spelling variants) of another name. These misspell names may not have been validly published and yet are nevertheless used in the literature and therefore included in The Plant List to guide those that find them. Confidence Levels For each name record The Plant List offers an indication of the confidence that the Status of the name record is correct. Our confidence assessments are based primarily on the nature and taxonomic integrity of the source data. High Confidence level is applied to the Status of name records derived from taxonomic datasets which treat the whole of the taxonomic group in question on a global basis and have been peer reviewed (e.g. ILLDIS, WCPSP, see collaborators). Medium Confidence level is applied to the Status of name records derived from: Either national or regional databases via a rules-based automated process, reflecting the challenges inherent in resolving taxonomic differences between different name data sets for the same species for different geographic areas. Regional datasets used as sources for The Plant List are primarily those stored within Tropicos (see collaborators for details). Or taxonomic datasets which treat the whole of the taxonomic group in question on a global basis but which have not undergone peer review (e.g. GCN and WCPSP (in review) see Collaborators). Low Confidence level is applied to the Status of name records derived from any of the contributing data sets which were recorded as unresolved in those data sets. The name records whose status has been inferred from (sometimes conflicting) information from more than one source database, to records derived from nomenclatural resources such as IPNI which do not contain opinions about the status of the name and which were assigned a status of Unresolved in The Plant List. The data resources used to build Version 1 of The Plant List are listed here and we are grateful to the many collaborators listed below that made their data available. We welcome offers of additional data sets for inclusion in the future editions of The Plant List (see Contributions). Global species resources This large database of global monographic treatments was supplied to The Plant List as two separate data sets which were treated slightly differently: Peer reviewed treatments are available online for 151 Seed Plant families (view published families), WCPSP gives information on the accepted scientific names and synonyms of selected plant families. It includes more than 320,000 names and allows the user to search for all the scientific names of a particular plant, or the areas of the world in which it grows (distribution). The data set counts upon the collaboration over 16 years of 132 specialists from 25 countries who have contributed data or acted as reviewers. In addition to the published family checklists the World Checklist database contains data for many other families which have either been completed and await review by specialists or are still being compiled. The Plant List also incorporates these unpublished data which include more than 290,000 additional names. The nomenclatural component of this database currently holds over 60,000 names and lists names for any given genus, geographical region or genus within a geographical region; and links to the GrassBase description for any species. The nomenclatural data from GrassBase is made available through the WCPSP system. is an integrated database of nomenclatural and taxonomic information for the second largest vascular plant family in the world. This checklist is published by the International Composite Alliance and compiled from many contributed datasets. The database will be continually updated. Additional information such as references, distribution and infraspecific taxa are available on the website. All species are marked as 'provisionally accepted names' in the beta version. The data set has not yet been fully peer-reviewed and may contain some errors. More than 100,000 records derived from The Global Compositae Checklist are included in The Plant List. is a long-term programme of co-operation among legume specialists worldwide to create a biodiversity database for the Leguminosae (Fabaceae) family. The database provides a taxonomic checklist plus basic factual data on distribution, common names, life-forms, uses, literature references to descriptions, illustrations and maps. More than 40,000 records derived from ILLDIS are included in The Plant List. The Rosaceae Database is a dataset of over 55,000 names with classification status, for this economically and ecologically important plant family. This extensive and highly polished dataset was developed by Dr Richard Pankhurst, with the help of colleagues at the Royal Botanic Garden Edinburgh, using his PANDORA database system. Due to the horticultural and agricultural importance of this family many taxon names are often of dubious validity and were published in inappreciable literature. However, Richard tracked down the original publication for ca. 95% of the names. Richard died in March 2013, and to facilitate the continued use of the data, the dataset has been included within the World Checklist of Selected Plant Families. The Rosaceae dataset is now being kept up to date as part of WCPSP, ensuring a lasting legacy for Richard's life's work. developed and tested the processes and procedures that would be required during production of an authoritative, global online list of plant names. The project was a collaboration between The Royal Botanic Gardens, Kew, the Missouri Botanical Garden and the New York Botanical Garden and was funded from April 2004 to May 2006 by the Gordon and Betty Moore Foundation. Checklists for the following families were made available for The Plant List: Bignoniaceae, Iridaceae, Lecythidaceae, Melanophyllaceae, Phytosaceae, Sarcocaulaceae, Schlegeliaceae and Sphaerosepalaceae. More than 11,000 records derived from iPlants are included in The Plant List. aims to provide a series of computerized databases summarizing taxonomic, biological, and other information on plants of the world. IOPI's mission is to develop an efficient and effective means of providing basic plant information to users, and guide them toward sources of authoritative data. Their checklist currently holds over 200,000 names from which The Plant List derives records for Juncaceae compiled by J. Kirschner (Institute of Botany, Pruhonice) (Over 1,000 name records). The Bryophyte information was primarily gathered from A Checklist of Mosses and ongoing projects dealing with mosses and liverworts to create World Checklists for these groups. Some liverwort names were not yet available from data sources but are expected to be added in future versions. Floristic Datasets the botanical information system at the Missouri Botanical Garden, Tropicos, contains information on over one million plant names and 3.9 million herbarium specimens. The system was developed through the actions of a wide variety of floristic, nomenclatural, and bibliographic projects both at the Garden and in collaboration with other institutions. All of this information is available on the Internet through the Garden's web site. Tropicos provides access to the accumulated data on vascular plant and bryophyte as authority files for the development of floras and checklists that provide synthesis of local and regional vegetation. Included within each of these syntheses are indications of acceptance, synonymy and misapplication of names within a floristic region. This information was used to evaluate plant names from these regions for The Plant List. The project data held by Tropicos and used in the development of The Plant List include: Information was also gleaned from recent published literature when the acceptance or synonyms have been recorded in Tropicos. More than 240,000 records derived from Tropicos were included in The Plant List. is a database originating from a collaboration between the Conservatory and Botanical Gardens of the City of Geneva (CJB) and the South African National Biodiversity Institute (SANBI) to bring together all names of vascular plants for sub-Saharan Africa. Further important contributions include North Africa (Alain Dobignard) and Madagascar (Missouri Botanical Garden). It encompasses information on all vascular plant species from Africa, including synonymy and information on the ecology and distribution of species. The database currently (2013) comprises more than 198,000 names of African plants with their nomenclatural status corresponding to some 57,000 accepted species. Data are updated on a regular basis, following the literature. The iPlants project also provides a checklist for Madagascar endemics. Plant nomenclature resources is a database of the names and associated basic bibliographical details of seed plants, ferns and fern allies. Its goal is to eliminate the need for repeated reference to primary sources for basic bibliographic information about plant names. The data are freely available and are gradually being standardised and checked. IPNI will be a dynamic resource, depending on direct contributions by all members of the botanical community. IPNI is the product of a collaboration between the Royal Botanic Gardens, Kew, the Harvard University Herbaria, and the Australian National Herbarium. Development of The Plant List has been a collaborative venture coordinated at the Royal Botanic Gardens, Kew and Missouri Botanical Garden and relying on the generosity of many collaborators who manage significant taxonomic data resources. The purpose was to merge into a single consistent database the best of the nomenclatural information available in these diverse data resources through a defined and automated process. In summary, development of The Plant List involved merging many taxonomic data sources taking the accepted name and synonymy relationships from those that were global checklist datasets, augmenting these and adding additional names and synonymy relationships from regional and national floristic datasets following a set of decision rules. Species names not accounted for in any of the previously incorporated data sets were added from nomenclatural resources, ensuring the list is comprehensive for all plant names. Finally a further set of rules are applied to the final data set to resolve inconsistencies, conflicting or overlapping statuses and to correct logical data errors. The Sequence for Merging Data Sets The starting point was the set of global, peer reviewed family checklists published within the World Checklist of Selected Plant Families (WCPSP). Families available through the WCPSP from other sources including GrassBase, iPlants (Bignoniaceae, Iridaceae, Lecythidaceae, Melanophyllaceae, Phytosaceae, Sarcocaulaceae, Schlegeliaceae and Sphaerosepalaceae) and IOPI (Juncaceae) were also included. To these were added additional global checklists from collaborating partners: The Global Compositae Checklist from the International Composite Alliance and The International Legume Database and Information Service. Also incorporated were all the compiled WCPSP data for families other than those which have been published (i.e. are in the process of being compiled or are under peer review). WCPSP (in review). The second category of information sources was various national and regional checklists. Missouri Botanical Garden's Tropicos system, primarily provided data from ten big digital flora projects. Each of these national or regional floras or checklists was created at a different time by a different team of botanists and considers only plant specimens found within that area's borders. Thus these floras/checklists contain different subsets of plants (and plant names) and often record conflicting opinions as to which are the accepted names for particular plants or what are their synonyms. In building The Plant List, therefore, a significant task was to automate procedures to trawl each of these different data sets to locate new information that they might contain about names and synonymy, then to detect and resolve conflicting opinions among these data sets and to add this additional information to the merged data set. A set of decision rules was employed to differentiate between and select from among the diverse opinions expressed within these national and regional data sets. Finally, there were many scientific plant names (recorded in IPNI or included in Tropicos or WCPSP as uncompiled records) that had not been included in any of the data sets consulted up to that point. The combined set of global and regional data was therefore compared with the IPNI database to detect names missing from our merged data set so that they could be added to our final product. Names derived from IPNI (and other nomenclatural data sets consulted) were included as 'Unresolved', since these data sets did not indicate whether these were Accepted names for plants not yet represented in the merged data set or whether they were Synonyms of plants already in the merged list. A significant component of this and later phases of the creation of The Plant List involved the matching of names between different data sets to identify whether a name was unique to one data set or included in multiple data sets. The algorithms employed to perform name matching varied depending upon the requirements at each stage in the process. Derivation of Name Status The procedures used to build The Plant List were designed to follow the taxonomic opinions recorded within the contributing data sets. Where necessary these procedures selected from among alternative and conflicting opinions recorded between data sets so as to achieve a coherent taxonomic consensus. Consistent application of the decision rules allowed resolution of most instances of conflicts between data sources so that most species names can be clearly presented as either an accepted name or as a synonym with reference to a data source in which that status is recorded. It is important to note that the set of synonyms which point to a given accepted name in The Plant List may have originated from more than one data source i.e. some synonyms for a given species may derive from a data set other than that from which the accepted name record derived. Approximately 98% of all Status values within The Plant List derive directly from the data source which supplied that name record. The Status of the remaining 2% of name records in The Plant List has been modified from that stored in the source data set as a result of the conflict resolution processes. Such changes were made only where necessary to avoid illogical conflicts detected within the data sets supplied or within the merged data set (i.e. they were made to improve the consistency of The Plant List). Where such changes were made, these were primarily to downgrade name records recorded as having a status of 'Accepted' in the source database to having a status of 'Unresolved' in The Plant List. Any name records whose status was modified during the creation of The Plant List are labelled (using an asterisk) and the original status in the data source is also indicated. The Confidence level of any record modified by these procedures was set to 'Low Confidence'. Decision Rules to arbitrate between Conflicts of Opinion A set of decision rules were employed to differentiate between and select from among diverse opinions expressed within all of the data sources consulted. These rules were developed by the team at Kew and Missouri in an attempt to mimic the sort of decision-making rationale a botanist might use in a situation where he/she encounters conflict between taxonomic treatments in the literature but is not in a position to resolve the question by examining the original material. For example: monographic treatments which consider the group in question in its entirety throughout its distribution are given priority over geographically defined treatments which can result in a single species being treated under different names in different parts of its range; synonymy relationships reported in more recent treatments are given priority over those published earlier; publication dates are used to assist in detecting likely illegitimate names; author details are used to detect likely orthographic variants (alternative spellings of the same name); the decision rules are informed by the principles embedded in the International Code of Botanical Nomenclature. Data analysis of logical inconsistencies and data integrity issues The data set created by merging records from the various data sources as described above was found initially to be inconsistent and logically incongruous for a variety of reasons. Each of the taxonomic data sets incorporated into The Plant List are themselves still being developed and improved upon by their owners and editors. None therefore can be considered to be complete or entirely up to date. Nor would their owners claim that these data sets were free of inconsistencies, gaps or data error. Furthermore these databases use terminology in different ways which necessitated some level of standardisation. Some contained fossil plant names or names of taxonomic ranks that are not intended to be included in The Plant List and yet which, nevertheless, might link to names in the merged data set. Careful filtering of the record set was needed. Inevitably, the process of bringing many different data sets together added a layer of further complexity. Thus for example it is not straightforward to automate recognition of a particular Latin binomial reliably within different data sets given that the plant name authors may have been cited or abbreviated differently, subtle differences in spelling and punctuation occur between the data sources and not all sources included the place of publication of a name to help resolve suspected matches. This added a degree of uncertainty even before other complexities such as those surrounding homonyms and misapplied use were dealt with. As a result, in certain circumstances, our procedures resulted in a few names being treated inconsistently in the merged dataset based upon unreconciled records derived from different sources. The goal of The Plant List project is to create a single internally coherent view rather than a set of alternative views. The final stage of development of The Plant List therefore involved rigorous logical analysis of the data set. Steps were taken, for example, to identify likely duplicates used in different senses, to detect where a number of Synonyms link one to another but lack any link to an Accepted name, where illegitimate names are assigned Accepted status or where a subspecies included in the dataset occurs within a species which itself does not occur. Resolution of logical inconsistencies and data integrity issues For each different data inconsistency detected, solutions were derived based upon the concepts and principles as outlined above and used in the previous stages. Additional decision rules were created and new automated steps introduced to perform the following actions on the merged data set: Standardisation of terminology Standardisation, Selection and Filtering of name records Deduplication of names Resolving referential integrity regarding linkages among synonyms. Resolving referential integrity regarding taxonomic relationships. Standardisation of the names of Families and Major Groups so as to create the taxonomic hierarchy necessary to support browsing of The Plant List. Online Publication of The Plant List Target 1 of the GSPC was to achieve a "widely accessible" working list of all known plant species by 2020. To accomplish that aspect of Target 1, this website was created to enable world-wide access to the working list. The final merged and resolved data set of all plant species is accessible through the search and browse features offered here. Next Steps As a result of the data analysis and conflict resolution steps described above it is now intended to provide detailed feedback to each of the collaborators that contributed datasets on providing them with enriched data records, information on inconsistencies detected and comparisons with other relevant data sets. Details of the data processing entailed in creating The Plant List are to be published for broader discussion. Interest in the process and suggestions for refinements to the decision rules are welcome. The Plant List owes its origins to a three-day workshop at Missouri Botanical Garden in May 2008. Bob Allkin, Eimear Nic Lughadha and Alan Paton (Kew) joined Bob Magill and Chuck Miller (MO) to plan how existing resources could best be combined to produce a best efforts working list to meet the 2010 deadline. The principles underlying our approach were agreed at that time, along with many of the decision rules and initial drafts of workflows for the data processing required. Translating that initial plan into action and refining the process to improve the product involved many more people over many months, with datasets, e-mails and occasionally people moving back and forward between Kew and St Louis. Contributors working at Kew Bob Allkin - Project Manager Abigail Barker - Applications Development Manager Matthew Blissett - Lead Developer Web Application Charlotte Couch - Support Families and Genera Index Paramjit Dhalival - IT Operations team Jeff Eden - Graphic Designer Rafaël Govaerts - Editor of the World Checklist of Selected Plant Families Graham Hawkes - Developer responsible for The Plant List data and procedures Chris Hopkins - Developer Web Application Eimear Nic Lughadha - Senior Responsible Owner Nicky Nicolson - Developer responsible for IPNI Alan Paton - Assistant Keeper, Herbarium John Stone - Graphic Designer Julius Welby - Data administration Ian Wright - IT Operations team leader Contributors working at Missouri Bob Magill - Senior Vice President of Science & Conservation Chuck Miller - Vice President of Information Technology Chris Freeland - Director of Center for Biodiversity Informatics Jay Paige - Application and Database Developer Heather Stimmel - Application and Database Developer Craig Geil - Application and Database Developer No further changes will be made to The Plant List. The Plant List Version 1.1 was used to populate the initial taxonomic backbone of The World Flora Online, and is now being enhanced by more recent data sources and Taxonomic Expert Networks (TENs). See - The World Flora Online will continue to link to names in TPL v1.1 as an online reference. The taxon pages in The World Flora Online link to names in TPL v.1 as an online reference. Of the data resources that were used to create The Plant List, many of the previously published global monographic datasets are also available through the Catalogue of Life, which provides peer reviewed information for many plant families. Page 6 The Plant List contains a working list of plants of the world. The species included are grouped into 17,020 genera, 642 families and 4 major groups. You can use the Browse function to explore the taxonomic hierarchy embedded within The Plant List. Either work down the taxonomic hierarchy from Major Group (to find out which Families belong to each), to Family (to work out which Genera belong to each) or Genus (to find out which Species belong to each). Or from within the taxonomic hierarchy move upwards so as to discover, for example, to which Family a particular Genus belongs. Click on the major plant group of interest to explore the taxonomic hierarchy embedded within The Plant List. Alternatively you can browse the entire contents of The Plant List by View statistics summarising the contents of The Plant List. Page 7 The Plant List is no longer accepting any comments concerning the data. Future updates of the original data sources will be made to the World Flora Online taxonomic backbone, and not to The Plant List. Please send your suggestions and comments to the WFO Taxonomic Working Group: taxwg@worldfloraonline.org. To participate in the project or propose new data sets If you have a taxonomic data set which complements or extends the scope of the data sets already contained within The Plant List or if you wish to participate in any other way in the future development of the world list, please contact the Taxonomic Working Group of the World Flora Online consortium by email to taxwg@worldfloraonline.org. Page 8 Species of The Plant List contained within The Plant List belong to 642 plant families and 17,020 plant genera. The Plant List includes 1,064,035 scientific plant names of species rank for the The Plant List. Of these 350,699 are accepted species names. The Plant List includes a further 229,650 scientific plant names of infraspecific rank for the The Plant List. We do not intend The Plant List to be complete for names of infraspecific rank. These are primarily included because names of species rank are synonyms of accepted infraspecific names. The status of the 1,064,035 species names for the The Plant List recorded in The Plant List, are as follows: The status of the 1,293,685 names (including infraspecific names) for the The Plant List recorded in The Plant List, are as follows: Of the species names, A further 1,320 name records indicate where names have been misapplied. The confidence with which the status of the 1,064,035 species names recorded in The Plant List for the The Plant List, are assigned as follows: Confidence level Accepted Synonym Unplaced Unassessed Total High confidence 149,349 229,242 0 378,591 35.6% Medium confidence 193,013 214,107 0 407,120 38.3% Low confidence 8,337 27,275 243 242,469 278,324 26.2% The source of the species name records found in The Plant List for the The Plant List is as follows: Source of record Accepted Synonym Unplaced Unassessed Misapplied Total LLDIS 19,874 21,972 0 30 1,048 41,876 3.9% IOPI 498 809 0 23 0 1,330 0.1% iPlants 193,013 214,107 0 407,120 38.3% Low confidence 8,337 27,275 243 242,469 278,324 26.2% Tropicos 99,498 96,396 0 28,570 0 224,464 21.1% WCPSP 122,609 198,158 0 10,836 149 331,603 31.2% WCPSP (in review) 67,398 91,174 189 134,622 116 293,383 27.6%

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