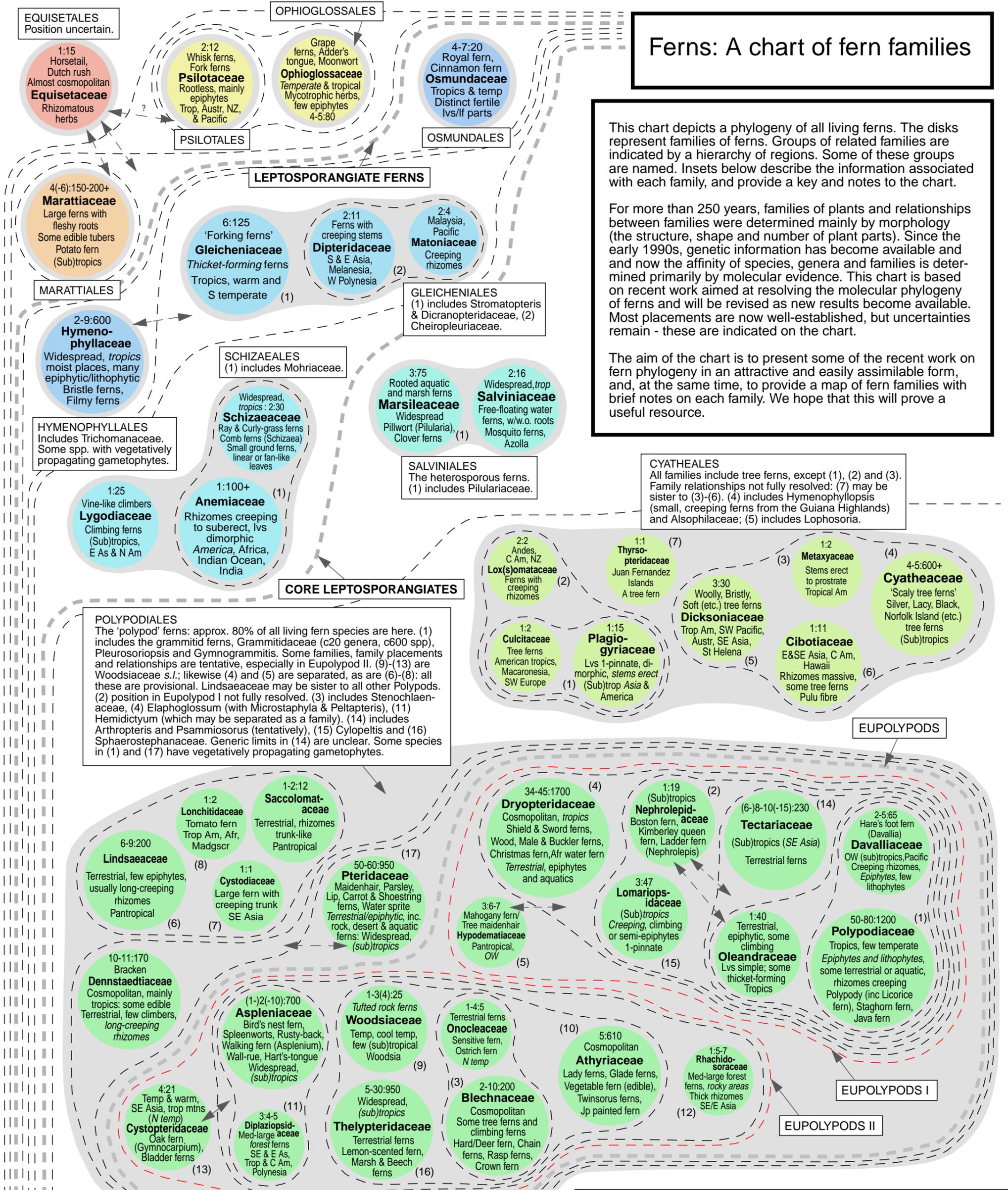


Ferns: A chart of fern families

This chart depicts a phylogeny of all living ferns. The disks represent families of ferns. Groups of related families are indicated by a hierarchy of regions. Some of these groups are named. Insets below describe the information associated with each family, and provide a key and notes to the chart.

For more than 250 years, families of plants and relationships between families were determined mainly by morphology (the structure, shape and number of plant parts). Since the early 1990s, genetic information has become available and now the affinity of species, genera and families is determined primarily by molecular evidence. This chart is based on recent work aimed at resolving the molecular phylogeny of ferns and will be revised as new results become available. Most placements are now well-established, but uncertainties remain - these are indicated on the chart.

The aim of the chart is to present some of the recent work on fern phylogeny in an attractive and easily assimilable form, and, at the same time, to provide a map of fern families with brief notes on each family. We hope that this will prove a useful resource.



POLYPODIALES
The 'polypod' ferns: approx. 80% of all living fern species are here. (1) includes the grammitid ferns, Grammitidaceae (c20 genera, c600 spp), Pleurosoriopsis and Gymnogrammitis. Some families, family placements and relationships are tentative, especially in Eupolypod II. (9)-(13) are Woodsiaceae s.l.; likewise (4) and (5) are separated, as are (6)-(8): all these are provisional. Lindsaeaceae may be sister to all other Polypods. (2) position in Eupolypod I not fully resolved. (3) includes Stenochlaenaceae, (4) Elaphoglossum (with Microstaphyla & Peltapteris), (11) Hemidictyum (which may be separated as a family), (14) includes Arthropteris and Psammiosorus (tentatively), (15) Cylopeltis and (16) Sphaerostephanaceae. Generic limits in (14) are unclear. Some species in (1) and (17) have vegetatively propagating gametophytes.

CYATHEALES
All families include tree ferns, except (1), (2) and (3). Family relationships not fully resolved: (7) may be sister to (3)-(6). (4) includes Hymenophyllopsis (small, creeping ferns from the Guiana Highlands) and Alsophilaceae; (5) includes Lophosoria.

FAMILY KEY

Approx. number of genera :
 Approx. number of species :
 Family name :
 Distribution :
 Range of growth forms :
 Some familiar ferns/products :

Family circumscriptions are based on those of Christenhusz, Zhang & Schneider (2011).

The size of the disk indicates the number of species, in ranges:
 1-10
 10-100
 100-1000
 1000-10000

KEY:
 Phrases in italics are to be read as 'mainly/predominantly', including 'centres of distribution'. (Sub)tropics = tropics and subtropics. N/S/E/W = North/South/East/West, C = Central. SE Asia includes the islands between mainland Asia and Austr. C Am includes the Caribbean islands. OW = Old World.

NOTES:
 The chart is available from www.botanicalchart.org.uk. The website gives details of the chart, its interpretation and sources. Several words of warning: Most of the families and relationships displayed here are well established. However, some uncertainties remain and these are noted. As further results appear, revised versions of the chart will be published. Common (or vernacular) names (in English) of ferns are included. These however should be treated with caution: a common name may be used for several different species and usage may vary around the world.