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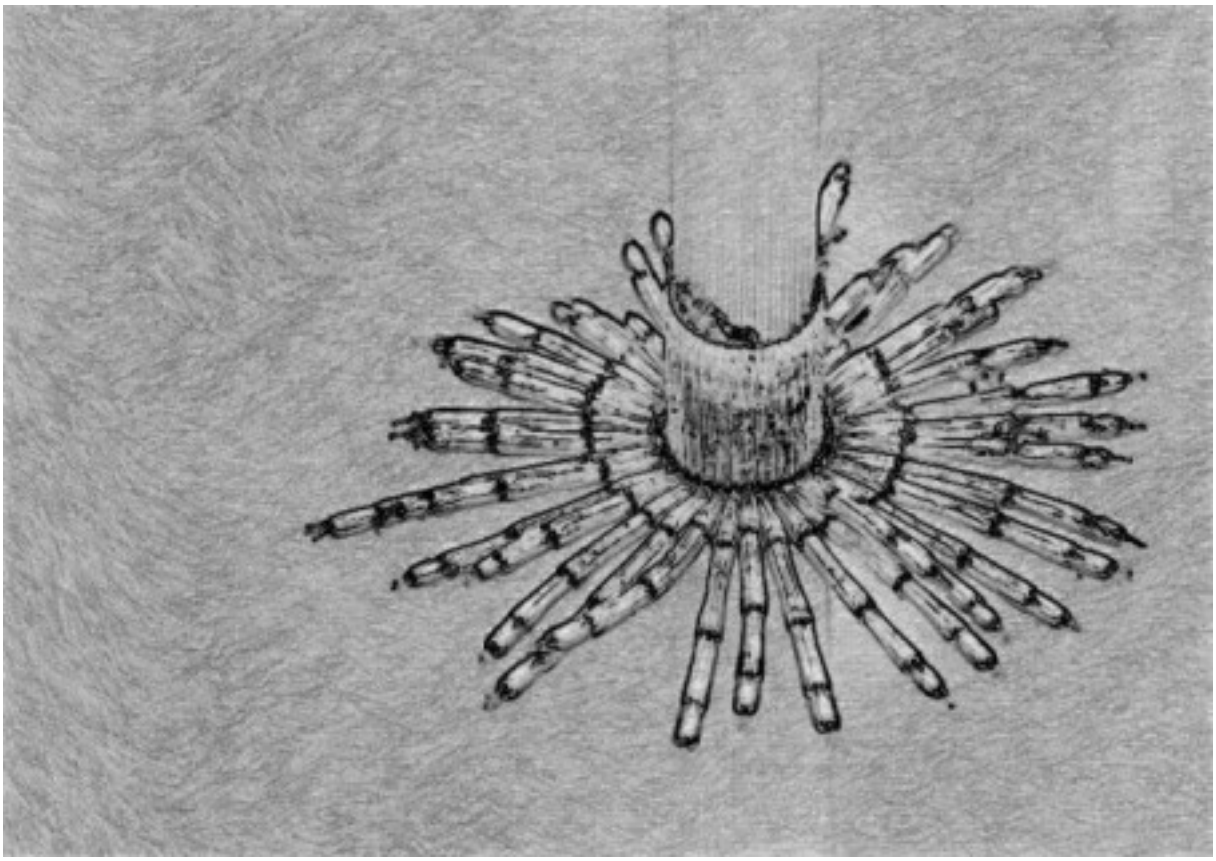

The International Equisetological Association (IEA) is a non-profit membership association whose mission is to promote Equisetology (Horsetail Biology) .

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Botanical Report

INTERNATIONAL EQUISETOLOGICAL ASSOCIATION
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Short Taxonomic Notes of Genus Equisetum (Horsetail)

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The INTERNATIONAL EQUISETOLOGICAL ASSOCIATION
And WORLD EQUISETUM PROGRAM – RESEARCH SERVICE

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Short General Characteristics :

Equisetum is a genus of vascular plants that reproduce by spores rather than seeds. The genus includes 15 main species commonly known as horsetails and scouring rushes. It is the only living genus in class Equisetopsida, formerly of the division Equisetophyta (Arthrophyta in older works), though recent molecular analyses place the genus within the ferns (Pteridophyta). Other classes and orders of Equisetopsida are known from the fossil record, where they were important members of the world flora during the Carboniferous period.

Etymology:
The name horsetail, often used for the entire group, arose because the branched species somewhat resemble a horse's tail, the name Equisetum being from the Latin equus, "horse", and seta, "bristle". Ironically Equisetum is poisonous to horses. Other names include candock (applied to branching species only), and scouring-rush (applied to the unbranched or sparsely branched species). The latter name refers to the plants' rush-like appearance; the stems were used for scouring cooking pots in the past (due to them being coated with abrasive silica).

Distribution:
The genus is near-cosmopolitan, being absent only from Australasia and Antarctica. They are perennial plants, either herbaceous, dying back in winter (most temperate species) or evergreen (some tropical species, and the temperate species Equisetum hyemale, E. scirpoides, E. variegatum and E. ramosissimum). They mostly grow 0.2-1.5 m tall, though E. telmateia can exceptionally reach 2.5 m, and the tropical American species E. giganteum 5 m, and E. myriochaetum 8 m.

Anatomy:

In these plants the leaves are greatly reduced and usually non-photosynthetic. They contain a single, non-branching vascular trace, which is the defining feature of microphylls. However, it has recently been recognised that these microphylls probably evolved by the reduction of a megaphyll; therefore they are commonly referred to as megaphylls to reflect this homology.

They grow in whorls fused into nodal sheaths. The stems are green and photosynthetic, also distinctive in being hollow, jointed, and ridged (with (3-) 6-40 ridges). There may or may not be whorls of branches at the nodes; when present, these branches are identical to the main stem except smaller.

Spores:

The spores are borne under sporangiophores in cone-like structures (strobilus, pl. strobili) at the tips of some of the stems. In many species the cone-bearing stems are unbranched, and in some (e.g. E. arvense) they are non-photosynthetic, produced early in spring separately from photosynthetic sterile stems. In some other species (e.g. E. palustre) they are very similar to sterile stems, photosynthetic and with whorls of branches.

Horsetails are mostly homosporous, though in E. arvense, smaller spores give rise to male prothalli. The spores have four elaters that act as moisture-sensitive springs, assisting spore dispersal after the sporangia have split open longitudinally.

Habitat:

Many plants in this genus prefer wet sandy soils, though some are aquatic and others adapted to wet clay soils. One horsetail, E. arvense, can be a nuisance weed because it readily regrows after being pulled out. The stalks arise from rhizomes that are deep underground and almost impossible to dig out. It is also unaffected by many herbicides designed to kill seed plants. The foliage of some species is poisonous to grazing animals if eaten in large quantities. Equisetum is cooked and eaten in Japan.

Geological history:

The horsetails are the sole surviving genus of the Equisetopsida, a diverse and widespread group during the Carboniferous period. Some species were large trees reaching to 30 m tall. The genus Calamites (family Calamitaceae) is abundant in coal deposits from the Carboniferous period.

Equisetum

Linnaeus, Sp. Pl. 2: 1061. 1753; Gen. Pl. ed. 5, 484, 1754.

Family Equisetaceae

Equisetum L.
[horsetail, scouring rush]
Popular Species

Equisetum arvense L.
[common horsetail, field horsetail]

Equisetum arvense L. f. alpestre (Wahlenb.) Luerss.
Equisetum arvense L. f. boreale (Bong.) Klinge
Equisetum arvense L. f. decumbens (G.Mey.) W.D.J.Koch
Equisetum arvense L. f. ramulosum (Rupr.) Klinge
Equisetum arvense L. f. varium (Milde) Klinge
Equisetum arvense L. ssp./var. alpestre Wahlenb.
Equisetum arvense L. ssp./var. boreale (Bong.) Rupr.
Equisetum arvense L. ssp./var. boreale (Bong.) Rupr. f. pseudo-varium Vict.
Equisetum arvense L. ssp./var. boreale (Bong.) Rupr. f. pseudo-alpestre Vict.
Equisetum arvense L. ssp./var. campestre Wahlenb.
Equisetum arvense L. ssp./var. riparium Farw.
Equisetum calderi B.Boivin

Equisetum X ferrissii Clute
[Ferriss' horsetail] PARENTS =

Equisetum hyemale L. ssp. affine (Engelm.) Calder & Roy L.Taylor X E. laevigatum A.Braun)

Equisetum hyemale L. ssp./var. elatum (Engelm.) C.V.Morton
Equisetum hyemale L. ssp./var. intermedium A.A.Eaton
Equisetum intermedium (A.A.Eaton) Rydb.

Equisetum fluviatile L.
[pipes, river horsetail, water horsetail]

Equisetum fluviatile L. f. linnaeanum (Döll) M.Broun
Equisetum fluviatile L. f. minus (R.Br.) M.Broun

Equisetum fluviatile L. f. natans (Vict.) M.Broun
Equisetum fluviatile L. ssp./var. limosum (L.) Gilbert
Equisetum limosum L.

Equisetum hyemale L. ssp. affine (Engelm.) Calder & Roy L.Taylor
[common scouring rush, scouring rush horsetail]

Equisetum affine Engelm.
Equisetum hyemale L. ssp./var. affine (Engelm.) A.A.Eaton
Equisetum hyemale L. ssp./var. californicum Milde
Equisetum hyemale L. ssp./var. pseudohyemale (Farw.) C.V.Morton
Equisetum hyemale L. ssp./var. robustum (A.Braun) A.A.Eaton
Equisetum prealtum Raf.
Equisetum robustum A.Braun
Equisetum robustum A.Braun ssp./var. affine Engelm.
Hippochaete hyemalis (L.) Bruhin ssp. affinis (Engelm.) W.A.Weber

Equisetum laevigatum A.Braun
[smooth horsetail, smooth scouring rush]

Equisetum funstonii A.A.Eaton
Equisetum kansanum J.H.Schaffn.
Equisetum laevigatum A.Braun ssp. funstonii (A.A.Eaton) Hartm.
Hippochaete laevigata (A.Braun) Farw.

Equisetum X litorale Kühlew. ex Rupr. (pro sp.)
[littoral horsetail, shore horsetail] PARENTS = Equisetum arvense L. X E. fluviatile L.

Equisetum X mackaii (Newman) Brichan
[MacKay's horsetail] PARENTS = Equisetum hyemale L. subsp. affine (Engelm.) Calder & Roy L.Taylor X E. variegatum Schleich. ex F.Weber & D.Mohr

Equisetum hyemale L. ssp. trachyodon A.Braun
Equisetum hyemale L. ssp./var. mackaii Newman
Equisetum trachyodon (A.Braun) W.D.J.Koch
Equisetum variegatum Schleich. ex F.Weber & D.Mohr ssp./var. jesupi A.A.Eaton

Equisetum X trachyodon (A.Braun) W.D.J.Koch

Equisetum X nelsonii (A.A.Eaton) J.H.Schaffn.

[Nelson's horsetail, Nelson's scouring rush] PARENTS =
Equisetum laevigatum A.Braun X E. variegatum Schleich. ex F.Weber & D.Mohr

Equisetum nelsonii (A.A.Eaton) J.H.Schaffn.

Equisetum variegatum Schleich. ex F.Weber & D.Mohr ssp./var. nelsonii A.A.Eaton

Equisetum palustre L.

[marsh horsetail]

Equisetum palustre L. f. verticillatum Milde

Equisetum palustre L. ssp./var. americanum Vict.

Equisetum palustre L. ssp./var. americanum Vict. f. luxurians Vict.

Equisetum palustre L. ssp./var. palustre

Equisetum palustre L. var. simplicissimum A.Braun

Equisetum pratense Ehrh.

[meadow horsetail

Equisetum pratense Ehrh. f. nanum (Milde) Klinge

Equisetum scirpoides Michx.

[dwarf scouring rush, sedge horsetail]

Equisetum scirpoides ssp. scirpoides Michx.

Equisetum scirpoides ssp. walkowiaki R.J.Walkowiak

Equisetum sylvaticum L.

[wood horsetail, woodland horsetail]

Equisetum sylvaticum L. ssp./var. multiramosum (Fernald) Wherry

Equisetum sylvaticum L. ssp./var. pauciramosum Milde

Equisetum sylvaticum L. ssp./var. pauciramosum Milde f. multiramosum Fernald

Equisetum variegatum Schleich. ex F.Weber & D.Mohr ssp. variegatum
[variegated horsetail, variegated scouring rush]

Equisetum variegatum Schleich. ex F.Weber & D.Mohr ssp./var. anceps Milde

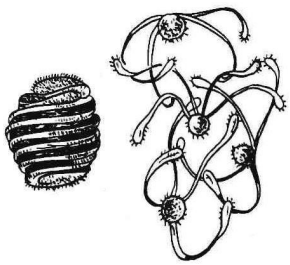
Equisetum variegatum Schleich. ex F.Weber & D.Mohr ssp./var. minus

Hippochaete variegata (Schleich. ex F.Weber & D.Mohr) Bruhin

[ssp. / Subspecies]
[var. / Varietas]
[f. / Forma]

[Important Taxonomic Name]

Equisetum spores



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