

## PTERIDOPHYTA

## LYCOPSIDA

## 1. LYCOPODIACEAE

Herbs with main stems suberect or creeping, sometimes below-ground. Lvs small, narrow, veinless or with midrib only; ligule 0. Sporangia all alike, borne singly at base of upper surface of sporophylls which may or may not form terminal cones. Prothalli mycorrhizic, partly or completely subterranean.

- |   |   |                  |
|---|---|------------------|
| 1 | Stems rooting only near base, suberect, forking above into equal branches; sporophylls aggregated but not in terminal cones.  |                  |
|   | Stems creeping with short lateral branches, rooting at intervals; sporophylls in terminal cones.  | 1. HUPERZIA      |
| 2 | Lvs in 4 rows.  | 4. DIPHASIASTRUM |
|   | Lvs spirally arranged or in whorls.   | 3                |
| 3 | Main stems procumbent; lvs flat, linear to linear-lanceolate, acute to hair-pointed; fertile branches forking; sporophylls broad-based and with toothed scarious margins. | 2. LYCOPODIUM    |
|   | Main stems prostrate; lvs upcurved, awl-shaped; fertile branches unforked, erect; sporophylls like lvs but with 2–4 basal teeth.  | 3. LYCOPODIELLA  |

## 1. HUPERZIA Bernh.

Stems short, ascending or suberect, forking a few times into branches of about equal length. Lvs in many rows. Sporangia stalked, in the axils of leaf-like sporophylls aggregated into subterminal fertile zones.

1. *H. selago* (L.) Bernh. ex Schrank & Mart. (*Lycopodium selago* L.)  
Fir Clubmoss

5–25 cm. Lvs 4–8 × c. 1.5 mm, linear to lanceolate, acute. Sporangia and bud-like gemmae borne in lf-axils in alternating zones. Spores ripe 6–8. Heaths, moors, mountain grassland and rock-ledges. Locally common in mountain districts but very rare in the lowlands.

## 2. LYCOPODIUM L.

Main stems long, procumbent, with few to numerous ascending branches. Lvs spirally arranged, flat, linear to lanceolate. Sporophylls in terminal cones, ovate, acute to hair-pointed, with broadly scarious fine-toothed margins.

- |   |                        |
|---|------------------------|
| Lvs and sporophylls with long white hair-points; cones at ends of long stalks bearing small somewhat scale-like lvs.                        | 1. <i>clavatum</i>     |
| Lvs and sporophylls acute but not hair-pointed; cones at ends of branches bearing ordinary lvs. Mountains in N. England and Scotland, rare. | <i>L. annotinum</i> L. |
| Interrupted Clubmoss  |                        |

1. *L. clavatum* L. Stag's-Horn Moss

Main stems (20–)30–100 cm, much branched. Lvs 3–5 mm, linear, with a long white hair-point 2–3 mm. Fertile branch-systems 5–15(–25) cm,

ascending and much branched below with normal lvs, but erect and forking only once or twice in the cone-bearing upper lengths where the smaller and less spreading lvs are linear-subulate, yellowish and distant. Cones 1–5 cm, borne 2(–3) close together at the ends of forks of the long stalk-like parts of the fertile branch, rarely solitary. Sporophylls ovate, tapering into long white hair-points. Spores ripe 6–9. Widely distributed and locally common on heaths and moors and in rough grassland, especially in mountain districts.

## 3. LYCOPODIELLA Holub

Main stems prostrate with a few short branches. Lvs spirally arranged, awl-shaped, curving upwards. Fertile branches erect, with terminal cones. Sporophylls much like the lvs but broader-based and with a few marginal teeth just above the sporangium.

1. *L. inundata* (L.) Holub (*Lycopodium inundatum* L.; *Lepidotis inundata* (L.) C. Börner) Marsh Clubmoss

Main stems 5–20 cm. Lvs 4–6 mm, awl-shaped, acute, curving towards the upper side of the stem. Cones 1–3 cm, solitary at the ends of simple suberect fertile branches bearing normal lvs throughout. Sporophylls more spreading than the lvs, with 1–2 teeth on each side just above the broadened base. Spores ripe 6–9. Local and rare in wet lowland heaths in S. and E. England and Ireland and in boggy moorland in N. England and Scotland.

## 4. DIPHASIASTRUM Holub

Main stems far-creeping, dorsiventral, with frequent branches forking into tufts of branchlets. Lvs opposite and decussate and thus in 4 rows, those of the lateral rows keeled. Cones single at the ends of branchlets of ascending and dichotomizing fertile branches. Sporophylls differing from ordinary lvs.

Finer branchlets not or little flattened; lvs usually glaucous; under-lvs of sterile branches lanceolate, stalked; sporophylls ovate-lanceolate, acute or acuminate.

1. *alpinum*

Finer branchlets distinctly flattened; lvs often true green; under-lvs of sterile branches linear, sessile; sporophylls ovate, suddenly acuminate. Mountain grassland and heath, very rare and sometimes confused with abnormal forms of 1.

*D. issleri* (Rouy) Holub (perhaps *D. alpinum* × *D. complanatum* (L.) Holub)

1. *D. alpinum* (L.) Holub (*Lycopodium alpinum* L.; *Diphasium alpinum* (L.) Rothm.) Alpine Clubmoss

Main stems 15–30(–50) cm, with densely tufted ascending not or little flattened branches. Lvs 2–4 mm, oblong-lanceolate, decurrent, usually glaucous, acute, often with a short broadish transparent pointed tip; lvs more distant on main stems than on branches. Cones 1–2 cm, at the ends of dichotomizing fertile branches, 4–7 cm, bearing ordinary lvs. Sporophylls ovate-lanceolate, acute or acuminate, with narrowly scarious fine-toothed margins. Spores ripe 6–8. Heaths, moors and rough grassland, especially in mountain districts; locally common.

**2. SELAGINELLACEAE**

3

**2. SELAGINELLACEAE**

Herbs with small minutely ligulate lvs which are either all spirally arranged and all similar, or in decussate pairs each comprising a spreading lateral lf and a diagonally opposite and much smaller appressed lf on the upper side of the stem, there being 4 rows of lvs in all. Sporangia borne singly near the base of the upper surface of sporophylls in terminal cones, those below with (1–)4 large spores (megasporengia, megaspores), but some near the apex of the cone having numerous small spores (microsporengia, microspores).

**1. SELAGINELLA Beauv.**

The only genus.

Lvs all similar, spirally arranged.

**1. selaginoides**

Lvs of 2 sizes in 4 rows. A small creeping plant, jointed at the nodes, with lateral lvs 2–3 mm, ovate-lanceolate, and upper lvs c. 1 mm, very unequal at the base. Cones up to 2 cm, 4-sided. An escape from greenhouses and naturalized in a few places in Cornwall, Wales and Ireland.

\**S. kraussiana* (G. Kunze) A. Braun

**1. *S. selaginoides* (L.) Link**

Lesser Clubmoss

Stems 3–15 cm, decumbent, slender, with short sterile and longer ascending fertile branches. Lvs 2–4 mm, spirally arranged, lanceolate, acute, sparsely and coarsely ciliate. Cones solitary on the ends of lf branches; sporophylls like the vegetative lvs but larger. Microsporengia few or sometimes 0. Spores ripe 6–8. Locally common in open vegetation in places permanently moist with water of at least moderately high calcium content (including mesotrophic and eutrophic soligenous mires), species-rich dwarf-shrub heaths, and dune-slacks, from N. Wales and N. Lincs northwards and in Ireland.

**3. ISOETACEAE**

Herbs, often aquatic, with short stout stems concave above and bearing numerous roots on the 2–3-lobed underside. Lvs in a dense rosette, subulate or filiform, usually hollow but with many internal septa; base broadened, sheathing; ligule present. Sporangia ± embedded in the lf-base below the ligule, of 2 kinds: earliest lvs of the season bear megasporengia with many megaspores 0.3–0.8 mm diam., later lvs microsporengia with very numerous microspores.

**1. ISOETES L.**

The only genus in the northern hemisphere.

- 1 Plant aquatic, never completely lfless; stem without persistent lf-bases; lvs 4–20(–50) cm × 2–5 mm.

2

Plant terrestrial, dormant and lfless in summer; stem ± covered by persistent glossy blackish lf-bases; lvs 2–8 cm × 0.5–1 mm, shining dark green; megaspores covered with small blunt tubercles which are often confluent. Peaty and sandy places, wet only in winter, in the Lizard district of Cornwall and the Channel Is. *I. hixtrix* Bory

- 2 Lvs 8–20(–50) cm, dark green, abruptly narrowed in the apical 5 mm, very stiff and brittle; megaspores covered with short blunt tubercles.

**1. lacustris**

Lvs 4–12(–20) cm, grass-green, tapering evenly from the base into hair-like tip, supple; megaspores covered with long spines.

2. *echinospora*1. *I. lacustris* L.

Quill-wort

Submerged aquatic with subulate subterete lvs tapering only slightly for most of their length then abruptly narrowed to an asymmetric point, usually held erect and not collapsing when removed from water. Megaspores greyish- or yellowish-white, 0.5–0.7 mm diam., covered with warty protuberances; spores ripe 5–7. In lakes and tarns with nutrient-poor water, chiefly on stones or sand with little or no silt or peat. Locally abundant in upland districts of S.W. England, N. Wales, Cumbria, Scotland north to Shetland, and Ireland.

2. *I. echinospora* Durieu (*I. setacea* auct.) Spiny-spored Quill-wort

Usually a smaller plant than *I. lacustris*, with flattened lvs which taper steadily throughout their length into the long hair-like tip and are markedly less rigid, often curving outwards and downwards and collapsing together into a brush when removed from water. Megaspores c. 0.5 mm diam., covered with long slender spines. Local in lakes, tarns and reservoirs, and usually on peat in very nutrient-poor water, in S.W. England, Wales, Lake District (only 1 locality), N. Scotland and Ireland.

## SPHENOPSISIDA

## 4. EQUISETACEAE

Herbs with creeping rhizomes. Stems hollow, grooved, simple or branched, all alike and green or fertile ones simple and not green. Lvs in whorls, small, joined into a sheath in lower part, rarely green. Sporangia all alike, on the under side of peltate sporangiophores which are borne in whorls and form a compact terminal cone.

## 1. EQUISETUM L.

The only genus.

- |   |   |                      |
|---|---|----------------------|
| 1 | All stems present fertile and not green.  | 2                    |
|   | Green sterile stems present (fertile ones present or not, like or unlike the sterile).  | 3                    |
| 2 | Sheaths numerous, with 20–30 teeth; cone 4–8 cm.  | 7. <i>telmateia</i>  |
|   | Sheaths 4–6, each with 6–12 teeth; cone 1–4 cm.   | 6. <i>arvense</i>    |
| 3 | Sterile stems with whorls of branches.  | 4                    |
|   | Sterile stems simple or with few branches.  | 10                   |
| 4 | Sterile stem c. 10 mm diam.; grooves 20–40, very fine; branches very numerous.  | 7. <i>telmateia</i>  |
|   | Sterile stem rarely more than 7 mm diam.; grooves fewer than 20 (if stouter or grooves more than 20 then branches few and ceasing several nodes below the top). | 5                    |
| 5 | Branches usually again branched; sheaths of main stems with 3–6 broad subacute teeth, fewer than the grooves.   | 5. <i>sylvaticum</i> |
|   | Branches usually simple; sheaths of main stem with awl-shaped teeth, as many as the grooves.  | 6                    |

- 1. EUISETUM** 5
- 6 Stem with 10–30 very fine shallow grooves; teeth not ribbed; sterile and fertile stems alike; central hollow at least  $\frac{1}{4}$  diam. of stem. 8
- 3. fluiatile**
- Stem with 4–20 deep grooves; teeth ribbed; central hollow less than  $\frac{1}{4}$  diam. of stem. 7
- 7 Fertile and sterile stems alike; branches hollow. 8  
Fertile and sterile stems normally differing; branches solid. 9
- 8 Stem with 4–8 grooves; central hollow less than  $\frac{1}{2}$  diam. of stem; cone blunt; common. 4. palustre  
Stem with 8–20 grooves; central hollow more than  $\frac{1}{2}$  diam. of stem; cone pointed. Lincolnshire; very rare. *E. ramosissimum* Desf.
- 9 Branches mostly 4-angled; fertile stems dying after fr. 6. arvense  
Branches mostly 3-angled; fertile stems often continuing to grow and branch after fr. Local in N. England, Scotland and N. Ireland. *E. pratense* Ehrh.
- 10 Sheaths finally with blackish bands at top and bottom; teeth soon falling; cone pointed. 1. hyemale  
Sheaths without a blackish band at bottom (though sometimes wholly black); teeth persistent; cone pointed or not. 11
- 11 Stems smooth or nearly so, dying in autumn; cone blunt. 12  
Stems very rough, persisting through the winter; cone pointed. 2. variegatum
- 12 Stems with 4–8 deep grooves; teeth 1-ribbed. 4. palustre  
Stems with 10–30 fine grooves; teeth not ribbed. 3. fluiatile

**1. E. hyemale** L.

Dutch Rush

Stems 30–100 cm, erect, 4–6 mm diam., simple, rough, persisting through the winter; grooves 10–30; sheaths about as long as broad, whitish with black bands at top and bottom. Spores ripe 7–8. Shady banks, etc., local in the north, very rare in the south

**E. × moorei** Newm., with stems dying in autumn and sheaths longer than broad, occurs in Scotland and in Ireland. **E. × trachyodon** A.Br., with persistent stems, wholly black sheaths and persistent teeth, is very local in Scotland and Ireland. Both probably have *E. hyemale* as one parent.

**2. E. variegatum** Schleicher ex Weber & Mohr

Variegated Horsetail

Stems 10–60 cm, usually decumbent, up to 3 mm diam., simple or sparsely branched, persisting through the winter; grooves 4–10; sheaths green with a black band at top. Spores ripe 7–8. Dunes, wet ground on mountains, etc., local in the north, rare elsewhere.

**3. E. fluiatile** L.

Water Horsetail

Stems 50–140 cm, ± erect, 2–12 mm diam., all green, simple or with irregular whorls of branches in the middle, smooth; grooves 10–30, very fine, sheaths fitting close to stem; teeth small, not ribbed; central hollow at least  $\frac{1}{4}$  diam. of stem. Branches simple, hollow. Spores ripe 6–7. In shallow water, less often in marshes, common and widespread.

**E. × litorale** Kühlew. ex Rupr. (*E. arvense* × *fluiatile*), with loose sheaths and central hollow  $\frac{1}{2}$ – $\frac{2}{3}$  diam. of stem, occurs locally.

**4. E. palustre** L.

Marsh Horsetail

Stems 10–60 cm, erect or decumbent, 1–3 mm diam., all green, usually irregularly branched, slightly rough; grooves 4–8, deep; sheaths loose;

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**5. OPHIOGLOSSACEAE**

teeth 1-ribbed; central hollow small. Branches simple, hollow. Damp places, common and widespread.

**5. *E. sylvaticum* L.**

Wood Horsetail

Fertile and sterile stems produced at the same time. Fertile stems at first simple and without chlorophyll, becoming green and branching after spore-dispersal. Sterile stems 10–80 cm, erect, c. 1–4 mm diam., nearly or quite smooth; grooves 10–18; teeth united into 3–6 broad, several-ribbed lobes. Branches solid, usually branched. Sheaths of fertile stems greenish below, brown above, with 3–6 broad brown teeth. Spores ripe 4–5. Shady places on acid soil, common in the north, very local in the south.

**6. *E. arvense* L.**

Common Horsetail

Fertile stems produced before the sterile ones, not green, simple, dying when spores are shed. Sterile stems 20–80 cm, erect or decumbent, c. 3–5 mm diam., green, slightly rough; grooves 6–19, deep; sheaths 3–8 mm; teeth 1-ribbed. Branches numerous, solid, usually simple. Fertile stems with 4–6 sheaths. Cone 1–4 cm. Spores ripe 4. Fields, roadsides, etc., common and widespread.

**7. *E. telmateia* Ehrh.**

Great Horsetail

Much larger than 6, with much-branched sterile stems, 50–200 cm, c. 1 cm diam., whitish; grooves 20–40, fine; sheaths 1.5–4 cm; teeth 2-ribbed. Fertile stems 20–40 cm, with numerous sheaths. Cone 4–8 cm; spores ripe 3–5. Damp shady places, spring-fens, seepage-lines, etc., rather local and becoming less common in the north and rare in Scotland apart from the south-west; Ireland.

**FILICOPSIDA**

In the following descriptions of members of the Filicopsida or ferns the degree of dissection of the lf (or 'frond') always refers to the lower part of the lf or pinna: the upper part is almost always less divided. 'Pinnate' is used throughout though 'pinnatisect' would be more correct. Lengths of pinnae, etc., refer to the best developed ones and lf-lengths (unless otherwise stated) to fertile lvs. It is unwise to attempt the identification of young or sterile plants until considerable experience has been gained. There is considerable variation in many ferns and no attempt is made to cover the extremes in the following descriptions.

**5. OPHIOGLOSSACEAE**

Herbs with short rhizomes; scales 0. Lvs 1 or more, not circinate in bud. Fertile lvs with a sterile blade and spore-bearing spike or panicle which, in British spp., appears as if terminal on a stem. Sporangia all alike, borne in 2 rows on the margin of the spike or of the panicle-branches.

Sterile blade pinnate; fertile portion a panicle.

1. **BOTRYCHIUM**

Sterile blade simple, entire; fertile portion a spike.

2. **OPHIGLOSSUM**

**6. OSMUNDACEAE**

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**1. BOTRYCHIUM Swartz**

Sterile blade pinnate or pinnately lobed. Sporangia sessile, on the branches of a panicle.

**1. B. lunaria (L.) Swartz**

Moonwort

Lvs (2-)5-15(-30) cm, solitary (-2), with a brown sheath at base; blade pinnate, oblong in outline; pinnae fan-shaped, entire or somewhat crenate, without midrib; panicle 1-3 times branched, overtopping blade. Spores ripe 6-8. Dry grassland and rock ledges; widespread but local.

**2. OPHIOGLOSSUM L.**

Sterile blade simple, net-veined. Sporangia sunken, in a simple spike or spikes.

1 Lvs usually single, rarely 2; blade more than 3 × 2 cm. **1. vulgatum**  
Lvs often 2-3 together; blade usually less than 3 × 2 cm. 2

2 Blade lanceolate to ovate, acute, 5-20(-30) mm wide, net-veined, with free vein-endings inside the network; 6-15 sporangia on each side of the fertile spike. Sandy ground and short turf near the sea in the north and west; very local. *O. azoricum* C. Presl (*O. vulgatum* ssp. *ambiguum* (Cosson & Germ.) E. F. Warburg)

Blade lanceolate to linear-lanceolate, blunt, 2-7 mm wide, net-veined, with no free vein-endings within the network; 5-10 sporangia on each side of the fertile spike; spores ripe 1-2. Channel and Scilly Is.  
*O. lusitanicum* L.

**1. O. vulgatum L.**

Adder's Tongue

Lf solitary, rarely 2; blade 3-15 × 2-6 cm, fleshy, yellow-green, sheathing the stalk of the fertile spike at base, net-veined, with free vein-endings inside the network; spike usually 2-5 cm, overtopping the blade, its apex sterile, acute; sporangia 12-40 on each side of the spike. Spores ripe 5-8. Widely distributed in damp grassland, fens and scrub throughout the British Is.

**6. OSMUNDACEAE**

Rhizome stout, not scaly. Lvs pinnately divided, with glandular hairs at the enlarged base of the petiole; veins not anastomosing. Sporangia on the margins or surface of the lf, all alike and developing simultaneously; indusium 0.

**1. OSMUNDA L.**

Sporangia marginal on reduced pinnules with no green blade; fertile pinnules at the top or in the middle of the lf, or the whole lf fertile. Outer lvs sterile.

**1. O. regalis L.**

Royal Fern

Lvs 30-300 cm, tufted, 2-pinnate, ± lanceolate in outline; fertile lvs with c. 2-3 pairs of sterile pinnae and 5-14 fertile pairs, markedly decreasing in size upwards. Sterile pinnae with narrowly winged rhachis. Pinnules 2-6.5 cm, oblong, ± truncate at base and often with a rounded lobe on the lower side; margins irregularly crenulate-serrate or occasionally

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Excerpt

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## 7. ADIANTACEAE

slightly lobed. Fertile pinnules up to 3 cm, densely covered with brown sporangia. Spores ripe 6–8. In boggy places, sides of lakes and streams, cliff-ledges, etc., local but widely distributed, mainly in the south and west.

## 7. ADIANTACEAE

Rhizome with opaque scales. Petiole dark and shining, with 2 vascular strands at the base, uniting distally. Sori borne on the down-turned lf-margins; spores tetrahedral.

## 1. ADIANTUM L.

Rhizome with narrow brown scales. Lvs all alike, with black glossy petiole and broad  $\pm$  fan-shaped segments. Damp crevices of cliffs and rocks, chiefly by the sea; very local and rare. Maidenhair fern.

*Adiantum capillus-veneris* L.

## 8. CRYPTOGRAMMACEAE

Rhizome with opaque scales. Petioles with a single cylindrical vascular strand. Sori submarginal on the vein-ends, at first distinct but forming a continuous band when mature; spores tetrahedral.

## 1. CRYPTOGRAMMA R.Br.

Rhizome stout, scaly. Sterile and fertile lvs dissimilar, 2–4 pinnate. Sori covered by the reflexed continuous lf-margin.

1. *C. crispa* (L.) R.Br. ex Hooker Parsley Fern

Lvs 15–20 cm, densely tufted, the outer sterile, inner fertile and with longer petioles. Sterile lvs 3-pinnatisect, triangular-ovate; pinnae 3–7 on each side; segments obovate, blunt, cuneate at base, lobed or toothed; petiole about twice as long as the blade, with a few scales at base. Fertile lvs 3–4-pinnate, segments oblong-linear. Sori becoming confluent when mature. Spores ripe 6–8. Screes, stone-walls, etc., on acid rocks in the west and north, usually in mountain districts; local.

## 9. GYMNOGRAMMACEAE

Rhizome with opaque scales. Petioles with 2 vascular strands. Sporangia along veins, not in well-defined sori; indusium 0; spores tetrahedral.

## 1. ANOGRAMMA Link

Annual fern with a short stock bearing few scales. Sterile and fertile lvs somewhat different, thin, 2–3 pinnate; lf-margin flat. On shady damp banks. Channel Is, very local. *Anogramma leptophylla* (L.) Link

## 10. HYPOLEPIDACEAE

Rhizome covered with hairs. Petioles with several vascular strands which fuse into a single U-shaped strand. Sori marginal, covered by the down-curved lf-margin but also with an inner indusial flap; spores tetrahedral.



**11. HYMENOPHYLLACEAE**

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**1. PTERIDIUM Scop.**

Rhizome far-creeping, hairy but not scaly, with short ascending branches. Sori continuous round the margin of the lf-segment.

**1. *P. aquilinum* (L.) Kuhn**

Bracken

Lvs (15–)30–180(–400) cm, (2–)3-pinnate, dying in autumn; petiole up to 2 m and c. 1 cm diam., erect, dark and hairy at base; blade bent towards the horizontal,  $\pm$  deltate in outline, scaly and hairy when young; segments 5–15 mm, oblong, sessile, broad-based, entire or lobed at base, rather thick. Spores ripe 7–8. Woods, heaths, moorlands, etc., mainly on light acid soils and often dominant in such places. Common throughout the British Is.

**11. HYMENOPHYLLACEAE**

Rhizome creeping, wiry. Lvs thin and translucent, their ultimate segments 1-veined. Sori marginal at the vein-endings. Indusium  $\pm$  cup-like, 2-lipped or 2-valved, surrounding the base or the whole of the sorus. Sporangia all alike, developing in regular succession from apex to base of the sorus.

Lvs mostly over 10 cm; rhizome over 1 mm diam.; pinnae 1–2-pinnatisect; indusium not 2-valved; receptacle projecting as a long bristle. Damp shaded rocks and by waterfalls; very rare and local in Ireland; nearly extinct in Great Britain. Killarney Fern. *Trichomanes speciosum* Willd.

Lvs rarely as much as 10 cm; rhizome not more than 1 mm diam.; pinnae irregularly dichotomously divided; indusium of 2 valves; receptacle not projecting.

**1. HYMENOPHYLLUM****1. HYMENOPHYLLUM Sm.**

Indusium of 2 valves; receptacle not projecting.

Valves of indusium orbicular, toothed; lf  $\pm$  flat.

**1. *tunbrigense***

Valves of indusium ovate, entire; pinnae bent back from the rhachis.

**2. *wilsonii*****1. *H. tunbrigense* (L.) Sm.**

Tunbridge Filmy Fern

Habit moss-like. Lvs 2.5–8(–12) cm, persistent for some years; blade  $\pm$  oblong in outline; pinnae divided into oblong, remotely serrulate segments, with the veins ceasing slightly below the apex; rhachis winged; petiole  $\frac{1}{3}$ – $\frac{1}{2}$  of the whole lf-length, wiry. Sori at the tips of the segments, mostly near the rhachis. Indusium flattened. Spores ripe 6–7. Rocks, tree trunks, etc., in humid places. Locally abundant in the west, north to Skye, absent from much of the east and from the Midlands.

**2. *H. wilsonii* Hooker**

Wilson's Filmy Fern

Like *H. tunbrigense* but pinnae bent back from rhachis, with fewer and more unilateral segments; veins reaching apex of segments; indusium not flattened. Spores ripe 6–7. In similar places to *H. tunbrigense* but commoner and extending to Shetland; absent from S.E. England.

**12. THELYPTERIDACEAE**

Lf-stalks with 2 vascular bundles below, uniting above to a single U-shaped strand; rhachis uninterruptedly grooved above. Lvs pinnate with pinnatifid

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## 12. THELYPTERIDACEAE

pinnae, their lobes broad-based; venation open. Sori small, up to 0.5 mm across; indusium  $\pm$  reniform or 0.

- 1 Rhizome erect; lvs in a definite crown; lf-stalks about  $\frac{1}{2}$  as long as blade; blade covered beneath with sessile yellow glands; sori very close to margin of pinna-lobes. 1. OREOPTERIS  
 Rhizome creeping; lvs borne singly or rarely a few in a tuft; lf-stalks about as long as blade or longer; blade  $\pm$  eglandular; sori marginal or submarginal. 2
- 2 Lf erect, lanceolate, with pinnae all in one plane; sori with indusium. 2. THELYPTERIS  
 Lf-stalk erect but the triangular-ovate blade held at an angle to it; lowest pair of pinnae turned downwards and forwards; indusium 0. 3. PHEGOPTERIS

## 1. OREOPTERIS Holub

Rhizome  $\pm$  erect. Lvs in a distinct crown, short-stalked, pinnate with deeply pinnatifid pinnae, longest near the middle of blade, all with numerous golden-yellow sessile glands beneath. Sori close to margin of pinna-lobes; indusium fugacious or 0.

1. *O. limbosperma* (All.) Holub (*Dryopteris oreopteris* (Ehrh.) Maxon)  
 Mountain Fern

Rhizome short, stout, with brown scales near apex. Lvs 30–100 cm, suberect. Lf-stalk short, stout, with sparse pale brown  $\pm$  ovate scales, especially below. Lf-blade lanceolate, firm, yellow-green, fragrant when crushed. Longest pinnae linear-lanceolate, decreasing towards base of blade until only c. 1 cm, deltate. Margins of pinna-lobes often very narrowly recurved. Sori near vein-endings; spores ripe 7–8. Damp woods, hedgebanks and pastures and steep banks above streams, especially in mountain districts; not on limestone; fairly common throughout the British Is but very local in E. Anglia and southern Midlands.

## 2. THELYPTERIS Schmidel

Rhizome slender and far-creeping. Lvs borne singly or rarely in small tufts; lf-stalk slender, black-based, about as long as blade or somewhat longer; blade pinnate with very deeply pinnatifid pinnae, longest near the middle but decreasing only slightly towards base; not conspicuously glandular beneath. Sori about midway between midrib and margin but appearing closer to margin because this is recurved; indusium  $\pm$  reniform but small, thin and irregularly toothed.

1. *T. thelypteroides* Michx (*T. palustris* Schott) Marsh Fern

Rhizome with a few small pale scales near apex. Lvs of 2 kinds: sterile, developing earlier, 15–60 cm; and fertile, a month later, 30–100 cm, stouter and stiffer and with relatively longer stalk. Both with the blade lanceolate, softish, when young with a few white hairs on rhachis, midribs and margins; pinnae linear-lanceolate. Spores ripe 7–8. Marshes, fens and fen-woods; locally frequent in E. Anglia but rare and scattered elsewhere.