## Descriptions

*Diphasiastrum alpinum* (L.) Holub

“Alpine Clubmoss”. *Lycopodium alpinum* L. **Morphology.** Stems elongated, with numerous small leaves; creeping, and rooting directly at intervals along their length (the erect branches to 10 cm); 15–50(–100) cm long; ostensibly monopodial vegetatively; with only slightly flattened branches; without secondary thickening. Leaves eligulate; strongly 4-ranked on the branches (in alternating, opposite pairs, glaucous); 2–4 mm long; appressed; not hair-pointed. Homosporous. Sporophylls differing markedly from the foliage leaves; aggregated into well defined terminal cones. Cones solitary, sessile at the tips of the normal shoots. The sporangia basal and subsessile on the adaxial surfaces of the sporophylls, non-septate. **Ecology and distribution.** Lowland, upland and montane (ascending to about 1300 m); moors, montane grassland and mountain tops. Rather common throughout the British Isles, especially at higher elevations. **Classification.** Family Lycopodiaceae.

*Diphasiastrum complanatum* (L.) Holub.

*Lycopodium* x *issleri* (Rouy) Domin, *L. complanatum* auct Brit., *L. alpinum* var. *decipiens* Syme. Supposedly = *L. alpinum* x *L. complanatum* L. **Morphology.** Stems elongated, with numerous small leaves; creeping, and rooting directly at intervals along their length; ostensibly monopodial vegetatively; with strongly flattened branches; without secondary thickening. Leaves eligulate; strongly 4-ranked on the branches (in alternating, opposite pairs, only slightly glaucous); 2–4 mm long; not hair-pointed. Homosporous. Sporophylls differing markedly from the foliage leaves; aggregated into well defined terminal cones. Cones solitary, sessile at the tips of the normal shoots. The sporangia basal and subsessile on the adaxial surfaces of the sporophylls, non-septate. **Ecology and distribution.** Lowland, upland and montane; heaths and moors. Curiously, the supposed parental species *L. complanatum* is no longer listed as British, it now being assumed that early records represent the hybrid. **Comments.** More robust in habit than *D. alpinum*, and more glaucous. **Classification.** Family Lycopodiaceae.

*Huperzia selago* (L.) Bernh. ex Schrank & Mart.

“Fir Clubmoss”. *Lycopodium selago*. **Morphology.** Stems elongated, with numerous small leaves; suberect, and rooting at the base only (decumbent only basally); 5–25 cm long; overtly dichotomising vegetatively; without secondary thickening. Leaves eligulate; 4–8 mm long; not hair-pointed. Homosporous. Sporophylls resembling the foliage leaves; in fertile zones tending to alternate with sterile zones along the stems, rather than in well defined terminal cones. The sporangia basal and subsessile on the adaxial surfaces of the sporophylls, non-septate. **Ecology and distribution.** Lowland, upland and montane; heaths, moors, mountain grasslands, rock ledges and mountain tops, ascending to about 1500 m. Throughout the British Isles, common in mountains but rare and decreasing in lowland regions. **Comments.** The megaspores are non-functional, reproduction being via bud-like gemmae produced in the leaf axils. **Classification.** Family Lycopodiaceae.

*Isoetes echinospora* Durieu

“Quill-wort”. **Morphology.** Stems short and tuberous, with sheathing leaves crowded in dense rosettes; with anomalous secondary thickening. The old leaf bases not persistent. Leaves ligulate; 40–120 mm long (x 2mm, more or less subulate, subterete, with four longitudinal septate tubes, without stomata; cf. those of *I. lacustris*, but more flaccid); spreading. Heterosporous. Sporophylls resembling the foliage leaves; in fertile zones tending to alternate with sterile zones along the stems, rather than in well defined terminal cones (the earliest leaves of the annual increment each with a basal, sunken megasporangium containing several hundred megaspores, these followed by leaves with one containing up to a million microspores, and the last-produced leaves sterile). The sporangia very large, transversely and longitudinally septate and embedded in the leaf bases. The megaspores covered with long, fragile spines. **Ecology and distribution.** Aquatic (in lakes and tarns, usually on peat). Lowland, upland and montane. With a western distribution: E. Cornwall, S. Devon, Dorset, Glamorgan, Merioneth, Caernarvon. **Classification.** Family Isoetaceae.

*Isoetes histrix* Bory

“Quill-wort”. **Morphology.** Stems short and tuberous, with sheathing leaves crowded in dense rosettes; with anomalous secondary thickening. The old leaf bases persistent on the stem, short and blackish, each with two long points. Leaves ligulate; 10–30 mm long (x 1mm, half-terete, with stomata); spreading. Heterosporous. Sporophylls resembling the foliage leaves; in fertile zones tending to alternate with sterile zones along the stems, rather than in well defined terminal cones (the earliest leaves of the annual increment each with a basal, sunken megasporangium containing several hundred megaspores, these followed by leaves with one containing up to a million microspores, and the last-produced leaves sterile). The sporangia very large, transversely and longitudinally septate and embedded in the leaf bases. The megaspores with a reticulate ornamentation, neither tuberculate nor spiny. **Ecology and distribution.** Terrestrial to aquatic (being only seasonally submerged, in sandy or peaty hollows on maritime cliff-tops). Lowland; heaths and sandy places. In Cornwall and the Channel Islands. **Classification.** Family Isoetaceae.

*Isoetes lacustris* L.

“Quill-wort”. **Morphology.** Stems short and tuberous, with sheathing leaves crowded in dense rosettes; with anomalous secondary thickening. The old leaf bases not persistent. Leaves ligulate; 80–200(–450) mm long (x 2–3mm, stiff, subulate, subterete, with four longitudinal septate tubes, without stomata); spreading. Heterosporous. Sporophylls resembling the foliage leaves; in fertile zones tending to alternate with sterile zones along the stems, rather than in well defined terminal cones (the earliest leaves of the annual increment each with a basal, sunken megasporangium containing several hundred megaspores, these followed by leaves with one containing up to a million microspores, and the last-produced leaves sterile). The sporangia very large, transversely and longitudinally septate and embedded in the leaf bases. The megaspores covered with short, blunt tubercles. **Ecology and distribution.** Aquatic. Upland and montane (in lakes and tarns with water poor in dissolved minerals). Wales, Shropshire, S.E. Yorkshire, Lake District, Scotland from Perth Northwards to Shetland, in Ireland mainly western. **Classification.** Family Isoetaceae.

*Lycopodiella inundata* (L.) Holub

“Marsh Clubmoss”. *Lycopodium inundatum* L. **Morphology.** Stems elongated, with numerous small leaves; creeping, and rooting directly at intervals along their length; 5–20 cm long; ostensibly monopodial vegetatively; without secondary thickening. Leaves eligulate; 4–6 mm long; spreading; not hair-pointed. Homosporous. Sporophylls differing markedly from the foliage leaves; aggregated into well defined terminal cones. Cones solitary, sessile at the tips of the normal shoots. The sporangia basal and subsessile on the adaxial surfaces of the sporophylls, non-septate. **Ecology and distribution.** Lowland; wet heaths. Throughout the British Isles, but local, rare in S. Scotland, Wales and N.E. England. **Classification.** Family Lycopodiaceae.

*Lycopodium annotinum* L.

“Interrrupted Clubmoss”. **Morphology.** Stems elongated, with numerous small leaves; creeping, and rooting directly at intervals along their length; 30–60 cm long; ostensibly monopodial vegetatively; without secondary thickening. Leaves eligulate; 4–6 mm long; spreading. Homosporous. Sporophylls differing markedly from the foliage leaves; aggregated into well defined terminal cones. Cones solitary, sessile at the tips of the normal shoots. The sporangia basal and subsessile on the adaxial surfaces of the sporophylls, non-septate. **Ecology and distribution.** Upland and montane; moors on mountains, ascending to about 900 m. Local in England and Scotland, extinct in Wales and absent from Ireland(?). **Classification.** Family Lycopodiaceae.

*Lycopodium clavatum* L.

“Common Clubmoss”, “Stag’s-Horn Moss”. **Morphology.** Stems elongated, with numerous small leaves; creeping, and rooting directly at intervals along their length; 30–100 cm long; ostensibly monopodial vegetatively; without secondary thickening. Leaves eligulate; 3–5 mm long; with long, filiform hair-like tips. Homosporous. Sporophylls aggregated into well defined terminal cones. Cones 1–2(-3), on long, erect peduncles which bear distant, appressed, scale-like leaves. The sporangia basal and subsessile on the adaxial surfaces of the sporophylls, non-septate. **Ecology and distribution.** Lowland, upland and montane; heaths, moors and montane grassland, ascending to about 900 m. Throughout the British Isles, but scarce in lowland areas. **Classification.** Family Lycopodiaceae.

*Selaginella kraussiana* (Kunze) A. Br.

**Morphology.** Stems elongated, with numerous small leaves; creeping, and rooting from characteristic, leafless, root-bearing branches (rhizophores); overtly dichotomising vegetatively; dorsiventrally organized, with four ranks of leaves (with two rows of leaves dorsally, and a row of larger leaves down each side); with strongly flattened branches; without secondary thickening. Leaves ligulate; 4-ranked on the branches; of two kinds: those of the two ranks on the upper side of the stem appressed and directed towards the stem apex, and those of the two lower ranks larger and spreading laterally; about 1 mm long (on the upper side of the stem), or 2 mm long (on the sides); appressed and spreading. Heterosporous. Sporophylls ovate, cuspidate, keeled; aggregated into well defined terminal cones. Cones sessile at the tips of the normal shoots (short, 4-sided). The sporangia basal and subsessile on the adaxial surfaces of the sporophylls, non-septate. **Ecology and distribution.** Commonly grown in greenhouses, naturalized in Cornwall, Ireland and perhaps elsewhere. **Classification.** Family Selaginellacae.

*Selaginella selaginoides* (L.) Link

“Lesser Clubmoss”. *S. spinosa* Beauv., *S. spinulosa* A. Br. **Morphology.** Stems elongated, with numerous small leaves; creeping, and rooting from characteristic, leafless, root-bearing branches (rhizophores); 3–15 cm long (the decumbent, slender stems bearing short sterile and long fertile, ascending branches); overtly dichotomising vegetatively; not dorsiventrally organized; with non-flattened branches; without secondary thickening. Leaves ligulate; not 4-ranked; all alike and spirally arranged; 2–4 mm long; appressed to spreading. Heterosporous. Sporophylls resembling the foliage leaves (but larger); aggregated into well defined terminal cones. Cones sessile at the tips of the normal shoots (1–1.5 cm long). The sporangia basal and subsessile on the adaxial surfaces of the sporophylls, non-septate. **Ecology and distribution.** Mainly montane; on damp, mossy or peaty ground. Widespread and rather common on high ground in England, Scotland, Wales and Ireland, ascending to about 1000 m. **Classification.** Family Selaginellacae.