

Key to the Moss Genera of Europe

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| 1. Gametophytes seemingly absent (consisting only of protonemata); sporophytes of asymmetric capsules and papillose setae. | <i>Buxbaumia</i> |
| 1. Gametophytes present (with obvious leaves); sporophytes various. | 2 |
| 2. Leaf cells arranged in a network of narrow, green cells alternating with large hyaline cells; branches usually in clusters. | <i>Sphagnum</i> |
| 2. Leaf cells of one kind (green), or if of two kinds, branches never in clusters. | 3 |
| 3. Leaves attached in two rows on opposite sides of the stem (distichous). | 4 |
| 3. Leaves attached all around the stem (foliate stems sometimes flattened [complanate]). | 7 |
| 4. Leaves appearing split at the base, consisting of two vaginant laminae which clasp the stem and base of the leaf above (equitant). | <i>Fissidens</i> |
| 4. Leaves with expanded bases, not clasping leaf above. | 5 |
| 5. Leaves ecostate; protonemata luminous. | <i>Schistostega</i> |
| 5. Leaves unicostate; protonemata not luminous. | 6 |
| 6. All leaves with a rough (papillose), linear subula. | <i>Distichium</i> |
| 6. Vegetative leaves with a smooth mucro; perichaetial leaves with a smooth subula. | <i>Bryoxiphium</i> |
| 7. Leaves with lamellae or filaments on the adaxial (upper) surface of the costa (excluding propagula). | 8 |
| 7. Leaves without lamellae or filaments on the adaxial surface of the costa (but propagula sometimes present). | 24 |
| 8. Leaves with filaments on the adaxial surface of the costa. | 9 |
| 8. Leaves with lamellae on the adaxial surface of the costa. | 10 |
| 9. Leaf margins broadly inrolled (and mostly obscuring the filaments). | <i>Aloina</i> |
| 9. Leaf margins reflexed to revolute | <i>Crossidium</i> |
| 10. Leaves bordered with elongate cells. | <i>Atrichum</i> |
| 10. Leaves without elongate, marginal cells. | 13 |
| 13. Lamellae 2-4; leaves hyaline awned; plants small, less than 5 mm; peristome none or rudimentary and fragile. | <i>Pterygoneurum</i> |
| 13. Lamellae 4-50; leaves mostly not awned; plants mostly larger; peristome of 32 or 64 persistent teeth. | 14 |
| 14. Lamellae distinctly wavy. | 15 |
| 14. Lamellae straight. | 16 |

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| 15. Upper leaf margins with border of hyaline, short- rhombic cells. | <i>Psilopilum</i> |
| 15. Upper leaf margins not bordered. | <i>Oligotrichum</i> |
| 16. Leaf laminae with teeth on abaxial (back) surface; calyptrae naked or with a few hairs. | <i>Oligotrichum</i> |
| 16. Leaf laminae smooth at back; calyptrae densely hairy. | 17 |
| 17. Plants with capsules. | 18 |
| 17. Plants without capsules. | 20 |
| 18. Capsules (2-)4(-6)-angled. | <i>Polytrichum</i> |
| 18. Capsules cylindric. | 19 |
| 19. Capsules without stomates; lumina of apical cells of lamellae not pyriform. | <i>Pogonatum</i> |
| 19. Capsules with stomates; lumina of apical cells of lamellae pyriform. | <i>Polytrichastrum</i> |
| 20. Apical cells of lamellae smooth or with faint cuticular ridges. | 21 |
| 20. Apical cells of lamellae papillose. | 22 |
| 21. Plants small, less than 6 mm high; leaves never awned. | <i>Pogonatum</i> |
| 21. Plants larger; leaves with or without awns. | <i>Polytrichum</i> |
| 22. Apical cells of lamellae rounded, quadrate or oblate. | <i>Pogonatum</i> |
| 22. Apical cells elliptic-pyriform. | <i>Polytrichastrum</i> |
| 24. Leaves without a costa or costa short and double, double, or single with 2-3 lateral spurs. | 25 |
| 24. Leaves with a single costa to at least midleaf. | 114 |
| 25. Although appearing none, costa single and occupying entire leaf area, thus leaf appearing multistratose with a central layer of chlorophyllose cells; plants albescent | <i>Leucobryum</i> |
| 25. Costa truly none or double. | 27 |
| 27. Lamina with 2 - 3 layers; very rare moss in subalpine streams only in the Nizke Tatry Mountains in Slovakia | <i>Ochryea</i> |
| 27. Lamina always unistratose | 27a |
| 27a. Upper leaf cells papillose or prorulose. | 28 |
| 27a. Upper leaf cells smooth (rarely with minute cuticular roughenings). | 48 |
| 28. Plant grey-green; leaf apices hyaline; leaf cell papillae large; capsules immersed, smooth; perichaetial leaves ciliate; widespread. | <i>Hedwigia</i> |
| 28. Plant green to yellow green; leaf apices \pm concolorous; | 30 |
| 30. Leaf cells pluripapillose. | 31 |
| 30. Leaf cells unipapillose or prorulose. | 33 |
| 31. Central strand absent; leaves not plicate when dry; capsule immersed | <i>Hedwigidium</i> |
| 31. Central strand present; leaves somewhat plicate when dry; capsule | <i>Braunia</i> |

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| exserted | |
| 33. Plants 2-3 pinnate, each year forming a flattened frond, the fronds arranged in a stair-step ascending pattern. | <i>Hylocomium</i> |
| 33. Plants simple or 1-pinnate, not forming ascending fronds. | 34 |
| 34. Leaves plicate. | 35 |
| 34. Leaves not plicate. | 36 |
| 35. Stem brown, red brown or seldom orange; leaves spreading to squarrose; margin serrate or serrulate. | <i>Rhytidiadelphus</i> |
| 35. Stem pale, or orange or yellowish. | 35a |
| 35a. Stem leaves from broad, cordate basal part rapidly narrowed into an often squarrose, acuminate point; leaves not falcate; margin strongly and irregularly dentate from base to apex. | <i>Hylocomium</i> |
| 35a. Leaves falcate to nearly straight, stem leaves not with squarrose point; margin serrate or dentate or entire to finely denticulate in the upper part. | <i>Ctenidium</i> |
| 36. Plants reddish-black, occurring tightly attached to rocks. | <i>Andreaea</i> |
| 36. Plants greenish, occurring on various substrates. | 37 |
| 37. Plants minute, less than 2 mm, acrocarpous. | <i>Ephemerum</i> |
| 37. Plants large, more than 1 cm, pleurocarpous. | 39 |
| 39. Alar cells numerous, oblate to rounded, strongly differentiated and extending up the margins. | <i>Pterogonium</i> |
| 39. Alar cells few, mostly quadrate, scarcely extending up the margins. | 40 |
| 40. Cells at midleaf more than 5:1. | 41 |
| 40. Cells at midleaf less than 5:1. | 43 |
| 41. Apical leaf cells much shorter than those at midleaf. | <i>Taxiphyllum</i> |
| 41. Apical leaf cells scarcely differentiated; leaves slenderly acuminate; prorulose at both upper and lower ends of cells. | <i>Chrysohypnum</i> |
| 43. Stem and branch leaves differentiated. | <i>Heterocladium</i> |
| 43. Stem and branch leaves similar. | 44 |
| 44. Leaves broadly ovate, concave, obtuse to obtuse- apiculate. | <i>Myurella</i> |
| 44. Leaves lanceolate to ovate-lanceolate, acute. | <i>Pterigynandrum</i> |
| 48. Plants aquatic, occurring submerged at least part of the year; leaves keeled or flat; margin entire; pleurocarpous. | <i>Fontinalis</i> |
| 48. Plants sometimes in wet habitats but usually not occurring submerged; leaves various but never keeled. | 49 |
| 49. Plants acrocarpous, usually less than 4 cm. | 50 |
| 49. Plants pleurocarpous, mostly larger. | 53 |
| 50. Plants occurring on rock. | 51 |
| 50. Plants occurring on bare soil. | 52 |

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| 51. Plants reddish-black; capsules valvate. | <i>Andreaea</i> |
| 51. Plants greenish-brown; capsules with four peristome teeth. | <i>Tetradontium</i> |
| 52. Branches erect, scattered along leafless rhizome; leaves silvery-white, margin entire; plants small. | <i>Gigaspermum</i> |
| 52. Plants arising from persistent protonema; stems very short (practically lacking); leaves not silvery-white; margin toothed or denticulate above, rarely entire; plants minute. | 52a. |
| 52a. Protonemata abundant; capsules ovoid, apiculate; calyptrae campanulate-mitrate, deciduous. | <i>Ephemerum</i> |
| 52a. Protonemata sparse; capsules globose; calyptrae very small, persistent. | <i>Micromitrium</i> |
| 53. Costa single, ending in lower acumen, strong and with several \pm long branches near base. | <i>Antitrichia</i> |
| 53. Costa double, or if single very short and without supplementary costae | 54 |
| 54. Stems with numerous paraphyllia. | 54a |
| 54. Stems lacking paraphyllia. | 55 |
| 54a. Stem leaves plicate, decurrent. | <i>Hylocomiastrum</i> |
| 54a. Stem leaves not plicate or decurrent | <i>Loeskeobryum</i> |
| 55. Stem leaves with a strong double nerve which ends far above mid-leaf; marginal leaf cells much longer and narrower than the other lamina cells, forming distinct border. | <i>Cyclodictyon</i> |
| 55. Stem leaves with very short and faint double or single nerve or nerve lacking. | 56 |
| 56. Leaf cells lax, hexagonal. | 57 |
| 56. Leaf cells firm- to thick-walled, rounded to linear. | 63 |
| 57. Ventral leaves differentiated from dorsal (and lateral) leaves; lateral and dorsal leaves differentiated in areolation, indistinctly bordered; stems pinnately branched. | <i>Vesicularia</i> |
| 57. Lateral and dorsal leaves with similar areolation; stems irregularly branched. | 58 |
| 58. Mid leave cells 60 - 100 μm wide; stem leaves plane, broadly ovate and with obtuse apex, unbordered; | <i>Hookeria</i> |
| 58. Mid leave cells 10 - 45 μm wide. | 59 |
| 59. Mid leave cells 10 - 17 μm wide; leaves not or indistinctly bordered, plants strongly glossy when dry. | <i>Lepidopilum</i> |
| 59. Mid leave cells 25 - 40 μm wide; leaves distinctly bordered | <i>Calypstrochaete</i> |
| 63. Leaves slenderly long-decurrent, \pm assymmetric; margin entire or denticulate near apex; plants mostly complanate-foliate; stem with 1-layered hyalodermis | <i>Plagiothecium</i> |
| 63. Leaves not slenderly long decurrent, from not decurrent to broadly auriculate or broadly decurrent. | 64 |

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| 64. Plants slender, thread-like; leaves mostly less than 1 mm long. | 65 |
| 64. Plants larger; leaves more than 1 mm long. | 67 |
| 65. Leaves more than 0.5 mm long; autoecious. | 65a |
| 65. Leaves usually only up to 0.5 mm. | 66 |
| 65a. Capsules inclined to horizontal; branches short, \pm erect. | <i>Homomallium</i> |
| 65a. Capsules erect; branches usually neatly curled when dry. | <i>Pylaisiella</i> |
| 66. Stem with a central strand (dioecious). | <i>Pseudoleskeella</i> |
| 66. Stem without a central strand. | 66a. |
| 66a. Uniseriate and shortly fusiform stem-borne gemmae often produced near shoot apex; leaf margin often distinctly notched (sinuous) at least below or entire (dioecious). | <i>Habrodon</i> |
| 66a. Plants without fusiform gemmae; leaf margin slightly denticulate or seldom entire (but then autoecious). | <i>Platydictia</i> |
| 67. Leaves falcate-secund. | 68 |
| 67. Leaves straight. | 84 |
| 68. Upper leaf cells oblong-rhombic, ca. 3:1. | 69 |
| 68. Leaf cells more or less linear, more than 6:1. | 70 |
| 69. Alar cells numerous, oblate, extending up the margins in many rows. | <i>Leucodon</i> |
| 69. Alar cells few, oblong-quadrate, in 1-2 rows along the insertion. | <i>Sematophyllum</i> |
| 70. Plants regularly and closely pinnate, feather-like; fronds flat, erect to ascending, oblong-triangular. | <i>Ptilium</i> |
| 70. Plants irregularly pinnate to unbranched, not feather-like; stems prostrate to loosely ascending. | 71 |
| 71. Mature branches erect and producing abundant and conspicuous propagula in their upper leaf axils. | <i>Platygyrium</i> |
| 71. Branches not producing propagula in leaf axils. | 72 |
| 72. Plants with crowded, short branches that curve upward when dry, erect when moist; alar cells small and quadrate; capsules erect, autoecious. | <i>Pylaisiella</i> |
| 72. Branches little altered when dry; alar cells various; capsules inclined to horizontal | 73 |
| 73. Alar cells when differentiated quadrate, sometimes enlarged but not at all inflated. | 75 |
| 73. Alar cells quadrate to oblong, inflated. | 79 |
| 75. Plants very large (stem leaves 3.5-5.0 mm), stems ascending to erect; leaves plicate. | <i>Rhytidiadelphus</i> |
| 75. Plants smaller (stem leaves less than 3.5 mm), stems prostrate to ascending; leaves various. | 76 |
| 76. Alar cells none or very few; pale propagula often clustered in leaf axils. | <i>Isopterygiopsis</i> |

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| 76. Alar cells distinctly differentiated. | 77 |
| 77. Plants occurring on wet rocks in mountain streams. | <i>Hygrohypnum</i> |
| 77. Plants in various habitats but not as above. | 78 |
| 78. Autoecious; basal cells of leave not porose, plants very slender. | <i>Homomallium</i> |
| 78. Mostly dioecious; basal cells porose or not. | <i>Hypnum</i> |
| 79. Plants occurring in calcareous fens or marl pools, dark reddish-brown; leaves obtuse. | <i>Scorpidium</i> |
| 79. Plants occurring in other habitats, golden to green; leaves acute to acuminate. | 80 |
| 80. Plants occurring on wet rocks in mountain streams. | <i>Hygrohypnum</i> |
| 80. Plants in various habitats but not as above. | 81 |
| 81. Alar cells thick-walled, inflated in several rows; leaf margins strongly serrate. | <i>Heterophyllum</i> |
| 81. Alar cells inflated in 1(-2) rows, or if more, thin-walled; leaf margins entire to serrulate. | 82 |
| 82. Stems surrounded by enlarged, thin-walled, hyaline cortical cells (hyalodermis); alar cells in large, subdecurrent areas. | <i>Hypnum</i> |
| 82. Stems surrounded by small, thick-walled, concolorous cells; alar cells in 1(-2) rows; plants very shiny; leaves 0.8-1.4 mm long, densely serrulate above; capsules inclined, asymmetric. | <i>Brotherella</i> |
| 84. Stem leaves abruptly contracted to long apiculus; margin plane below, inflexed above; leaves of secondary stem imbricate and in \pm distinct spiral rows. Plants large, forming thick, strongly turgid patches. | <i>Myurium</i> |
| 84. Stem leaves acute, acuminate or apiculate. | 86 |
| 86. Leaves squarrose-recurved when dry, with channeled apices. | 87 |
| 86. Leaves erect to spreading, or if squarrose only when moist, the apices mostly not channeled. | 88 |
| 87. Stem leaves greater than 2.5 mm long; alar cells oblong, somewhat inflated, intramarginal. | <i>Rhytidiadelphus</i> |
| 87. Stem leaves less than 2.5 mm long; alar cells subquadrate, not at all inflated, marginal. | <i>Campyllum</i> |
| 88. Margin irregularly serrate or dentate from base to apex; lanceolate, unbranched paraphyllia present but sparse; stem leaves cordate-triangular, shortly tapering to acute to filiform apex; stem pale; seta rough; in moist or wet habitats; dioecious. | <i>Hyocomium</i> |
| 88. Margin usually not irregularly serrate or dentate from base to apex, (except <i>Herzogiella</i> , which is autoecious and <i>Taxiphyllum</i> which has the stems complanate-foliate) | 88a |
| 88a. Plants occurring on wet rocks in mountain streams; leaves ovate, concave; seta smooth. | <i>Hygrohypnum</i> |
| 88a. Plants in other habitats but not as above; leaves various. | 89 |

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| 89. Stems complanate-foliate. | 90 |
| 89. Stems symmetrically foliate. | 96 |
| 90. Alar cells numerous and quadrate; capsules erect. | <i>Entodon</i> |
| 90. Alar cells few, variously shaped; capsules usually inclined. | 91 |
| 91. Plants occurring on vertical substrates, tree trunks or rocks. | <i>Neckera</i> |
| 91. Plants occurring on horizontal substrates, rarely the extreme bases of trees. | 92 |
| 92. Leaf margins serrulate throughout. | 93 |
| 92. Leaf margins entire or serrulate only in upper half. | 94 |
| 93. Apical leaf cells shorter than those at midleaf. | <i>Taxiphyllum</i> |
| 93. Apical leaf cells undifferentiated. | <i>Herzogiella</i> |
| 94. Rhizoids arising from leaf axils, papillose; leaf margins more or less entire. | <i>Isopterygiopsis</i> |
| 94. Rhizoids arising from below leaf insertion, smooth; leaf margins serrulate above. | 95 |
| 95. Pseudoparaphyllia filamentous; annuli not differentiated; plants mostly monoicous. | <i>Isopterygium</i> |
| 95. Pseudoparaphyllia absent; annuli differentiated; plants mostly dioecious. | <i>Pseudotaxiphyllum</i> |
| 96. Alar cells inflated. | 97 |
| 96. Alar cells rectangular to quadrate, not inflated. | 101 |
| 97. Plants erect; stems with hyalodermis; alar cells hyaline and in auricles. | <i>Calliergonella</i> |
| 97. Plants prostrate; stems without hyalodermis; alar cells yellowish, not in auricles. | 98 |
| 98. Alar cells uniform, without an enlarged basal row; stem apices flattened. | <i>Callicladium</i> |
| 98. Alar cells with an enlarged basal row; stem apices not flattened; exostome teeth striate; endostome with evident basal membrane and segments. | <i>Sematophyllum</i> |
| 101. Plants with numerous (more than 50), quadrate alar cells, extending up the margins by more than 12 rows. | 104 |
| 101. Plants with fewer (less than 30), quadrate to rectangular alar cells, extending up the margins in less than 8 rows. | 109 |
| 104. Alar cells extending up the margins for less than 1/6 the leaf length; leaves mostly obtuse to acute, rarely acuminate, never decurrent; endostome lacking cilia. | <i>Entodon</i> |
| 104. Alar cells extending up the margins for more than 1/3 the leaf length. | <i>Leucodon</i> |
| 109. Stems with hyalodermis; leaf margins serrulate to base. | <i>Herzogiella</i> |
| 109. Stems without hyalodermis; leaf margins entire or serrulate | 110 |

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| above. | |
| 110. Leaves plicate. | <i>Orthothecium</i> |
| 110. Leaves not plicate. | 111 |
| 111. Leaf apices obtuse-apiculate. | 112 |
| 111. Leaf apices acuminate. | 113 |
| 112. Plants occurring in fens; stems green, sparsely branched. | <i>Pseudocalliergon</i> |
| 112. Plants widespread in acidic habitats of the boreal forest; stems reddish-orange, pinnately branched. | <i>Pleurozium</i> |
| 113. Leaf cells porose throughout; pseudoparaphyllia absent or foliose; capsules erect or slightly inclined; glossy plants in boreal, arctic and alpine habitats. | <i>Orthothecium</i> |
| 113. Leaf cells not porose except at insertion. | 113a |
| 113a. Capsules erect. | <i>Pylaisiella</i> |
| 113a Capsules \pm inclined. | 113b |
| 113b. Pseudoparaphyllia filamentous; capsules without annulus. | <i>Isopterygium</i> |
| 113b. Pseudoparaphyllia absent; capsules with annulus of 2 - 3 rows of inflated, separating cells. | <i>Homomallium</i> |
| 114. Plants dendroid, erect, from a nonbranched stipe. | 115 |
| 114. Plants prostrate to erect, simple to pinnately branched. | 121 |
| 115. Leaves bordered by elongate cells. | <i>Hypopterygium</i> |
| 115. Leaves not bordered. | 117 |
| 117. Stems without paraphyllia, but pseudoparaphyllia present; branch leaves not longitudinally plicate. | <i>Thamnobryum</i> |
| 117. Stems with branched, threadlike paraphyllia; branch leaves longitudinally plicate. | <i>Climacium</i> |
| 121. Plants blackish, tightly attached to acidic rocks in arctic and montane areas; capsules valvate; capsules hygroscopic, when moist elliptic, tapering to a point. | <i>Andreaea</i> |
| 121. Plants greenish to blackish, on various substrates; capsules cleistocarpous or operculate, never valvate. | 123 |
| 123. Leaves strongly squarrose-recurved wet or dry; plants occurring in fens. | <i>Paludella</i> |
| 123. Leaves erect to squarrose; plants occurring in various habitats. | 124 |
| 124. Stems with paraphyllia. | 125 |
| 124. Stems lacking paraphyllia (rarely with paraphyllia in <i>Amblystegium</i>) | 142 |
| 125. Stems complanate-foliate; stem leaves undulate. | <i>Metaneckera</i> |
| 125. Stems symmetrically foliate; leaves not undulate. | 126 |
| 126. Alar cells inflated in well marked groups. | 127 |
| 126. Alar cells mostly not differentiated, if so, not inflated. | 128 |

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| 127. Stem leaves deeply plicate; paraphyllia filamentous, abundant. | <i>Palustriella</i> |
| 127. Stem leaves not plicate; paraphyllia foliose, sparse to abundant. | <i>Cratoneuron</i> |
| 128. Paraphyllia with short cells, 1-3:1. | 129 |
| 128. Paraphyllia with elongate cells, more than 5:1. | 140 |
| 129. Cells of paraphyllia papillose. | 130 |
| 129. Cells of paraphyllia smooth. | 135 |
| 130. Leaf cells unipapillose. | 131 |
| 130. Leaf cells pluripapillose. | 132 |
| 131. Plants once-pinnate; leaf cells papillose on both surfaces. | <i>Abietinella</i> |
| 131. Plants 2-3-pinnate; leaf cells papillose only at back. | <i>Thuidium</i> |
| 132. Plants large, dioecious; leaf cells papillose only at back. | <i>Thuidium</i> |
| 132. Plants small, autoecious; leaf cells papillose on both surfaces; plants 1-2-pinnate; leaves incurved when dry; setae smooth or papillose. | <i>Cyrto-hypnum</i> |
| 135. Costa pellucid; stem leaves usually with almost piliform acumen; leaves serrate; leaf cells unipapillose except at the margins. | <i>Claopodium</i> |
| 135. Costa opaque; stem leaves not piliform. | 136 |
| 136. Branch leaves ending in a sharp unipapillose cell, papilla often towards upper end; cells unipapillose at back often towards upper end; stem and branch leaves somewhat differentiated; autoecious. | <i>Haplocladium</i> |
| 136. Branch leaves usually ending in smooth cell; cells smooth or papillose. | 137 |
| 137. Leaf cells isodiametric or nearly so, hexagonal to short-rhombic. | 138 |
| 137. Leaf cells elongate, oblong-rhombic to oblong-linear. | 139 |
| 138. Dioecious; capsules inclined, asymmetric; exostome teeth striate. | <i>Pseudoleskea</i> |
| 138. Autoecious; capsules erect, symmetric; exostome teeth pale and papillose. | <i>Leskea</i> |
| 139. Walls of elongated basal lamina cells pitted and knotty; leaves deeply plicate; stem leaves 2,3 - 3 mm long. | <i>Ptychodium</i> |
| 139. Walls of elongated basal lamina cells smooth or hardly pitted; leaves shallowly plicate; stem leaves usually (except sometimes in <i>Pseudoleskea radicata</i>) less than 2 mm long. | 139a |
| 139a. Capsules erect, symmetric; endostome segments narrow, not keeled; basal lamina cells near nerve (except sometimes one or two rows) several times longer than wide. | <i>Lescurea</i> |
| 139a. Capsules inclined, asymmetric; endostome segments broader, keeled; basal lamina cells near nerve \pm isodiametric (except for a few cells close to the nerve which can be twice as long as wide). | <i>Pseudoleskea</i> |
| 140. Leaf margins entire to serrulate. | <i>Helodium</i> |
| 140. Leaf margins strongly serrate in upper half. | 141 |
| 141. Upper leaf cells short, 2-5:1. | <i>Climacium</i> |

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| 141. Upper leaf cells linear, more than 8:1. | <i>Hylocomium</i> |
| 142. Plants whitish; leaves composed mostly of costa, multistratose, with small green cells enclosed between 2 layers of hyaline cells on both surfaces. | <i>Leucobryum</i> |
| 142. Plants greenish to blackish, rarely whitish; leaves usually with conspicuous lamina, if not green cells and hyaline cells of about equal size with only a single layer of hyaline cells on either side of the green cells. | 143 |
| 143. Leaves with sheathing base; upper cells short rectangular, lacking papillae; in Macaronesia, Portugal and Crete | <i>Rhamphidium</i> |
| 143. Leaves without sheathing base, or if with, then upper cells often quadrate and with papillae. | 144 |
| 144. Leaf margins strongly incurved to involute, at least when dry. | 145 |
| 144. Leaf margins plane to recurved. | 149 |
| 145. Leaf margins incurved wet or dry. | 147 |
| 145. Leaf margins incurved when dry, plane when moist; peristome absent. | <i>Hyophila</i> |
| 147. Capsules exserted, operculate. | <i>Weissia</i> |
| 147. Capsules immersed to emergent, cleistocarpous. | <i>Astomum</i> |
| 149. Plants minute, occurring on soil (or rarely rock), ephemeral, often with persistent protonemata; capsules immersed. | 150 |
| 149. Plants mostly larger, occurring on various substrates, mostly not ephemeral, or if so, capsules exserted. | 161 |
| 150. Capsules operculate. | 151 |
| 150. Capsules cleistocarpous. | 152 |
| 151. Exothecial cells collenchymatous. | <i>Aphanorrhagma</i> |
| 151. Exothecial cells not thickened at corners. | <i>Physcomitrium</i> |
| 152. Spores few per capsule, more than 100 µm in diameter; leaves oblong to lanceolate, acute to subulate; plants not rhizomatous. | <i>Archidium</i> |
| 152. Spores numerous per capsule, less than 60 µm in diameter. | 154 |
| 154. Leaves ovate to broadly ovate, abruptly cuspidate to apiculate. | 155 |
| 154. Leaves narrowly lanceolate to oblong; costa subpercurrent to subulate. | 157 |
| 155. Leaf cells pluripapillose with C-shaped papillae; leaf margins revolute. | <i>Phascum</i> |
| 155. Leaf cells smooth or with 1-2 blunt, conical papillae; leaf margins plane to erect | 156 |
| 156. Stems arising from a leafless, branching rhizome, 2 - 5 mm long; lenticular gemmae (0,3 - 0,6 mm in diameter) produced at stem apex | <i>Oedipodiella</i> |
| 156. Stems not arising from a rhizome, shorter than 1 mm; lenticular gemmae not produced at stem apex | 156a |

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| 156a. Plants bulbiform, occurring on soil; leaves very broad and deeply concave with a reflexed tip. | <i>Acaulon</i> |
| 156a. Plants not bulbiform, occurring on the underside of quartz pebbles; leaves oblong-lanceolate to oblong-ovate, the tip not reflexed. | <i>Aschisma</i> |
| 157. Capsules pyriform with a conspicuous stomatose neck. | <i>Bruchia</i> |
| 157. Capsules globose to broadly elliptic without a conspicuously differentiated neck. | 158 |
| 158. Costa long excurrent, at least on perichaetial leaves. | <i>Pleuridium</i> |
| 158. Costa subpercurrent. | 159 |
| 159. Leaf margins spinose-serrulate throughout. | <i>Ephemerum</i> |
| 159. Leaf margins entire or serrulate above. | 160 |
| 160. Leaves lanceolate. | <i>Pseudephemerum</i> |
| 160. Leaves oblong-lanceolate to obovate. | <i>Physcomitrella</i> |
| 161. Neck of capsules (apophysis) as wide or wider than upper portion (urn) when mature; occurring on dung and animal remains. | 162 |
| 161. Neck of capsules considerably narrower than urn; occurring on various substrates. | 164 |
| 162. Capsules dumb-bell shaped when mature; seta weak, hyaline; apical cells of leaf wide, thin-walled; (Scandinavia; very rare in Great Britain) | <i>Aplodon</i> |
| 162. Capsules (at least the urn) cylindrical; seta colored; widespread. | 163 |
| 163. Apophyses narrowly pyriform, the same color or darker than the urn; peristome teeth joined in 4's, later in 2's, not chambered; apical cells of leaf narrow to linear, \pm incrassate. | <i>Tetraplodon</i> |
| 163. Apophyses globose to turbinate, sometimes becoming umbrella-like, differentiated in color; peristome teeth sometimes approximate or fused in pairs, chambered. | <i>Splachnum</i> |
| 164. Leaves of two kinds, large lateral ones and smaller dorsal ones, bordered; plants erect. | <i>Epipterygium</i> |
| 164. Leaves all of one kind. | 166 |
| 166. Capsules cleistocarpous; plants rare. | 167 |
| 166. Capsules operculate; plants rare to common. | 169 |
| 167. Stems arising from a leafless, branching rhizome, 2 - 5 mm long; lenticular gemmae (0,3 - 0,6 mm in diameter) produced at stem apex; capsules immersed. | <i>Oedipodiella</i> |
| 167. Stems not arising from a rhizome, shorter than 1 mm; lenticular gemmae not produced at stem apex; capsules exerted | 167a |
| 167a. Plants occurring on wet soil. | <i>Bruchia</i> |
| 167a. Plants known from arctic and alpine tundra on animal-derived substrates. | 168 |
| 168. Capsules broadest in lower half. | <i>Voitia</i> |

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| 168. Capsules broadest in upper half. | <i>Tetraplodon</i> |
| 169. Cells with nodulose-wavy walls throughout the leaf, sometimes most conspicuous toward leaf base when upper cells short. | <i>Racomitrium</i> |
| 169. Cells without nodulose-wavy walls, or if present only near insertion. | 170 |
| 170. Leaves with hyaline hair-points. | 171 |
| 170. Leaves without hair-points, or if with hairpoints not hyaline. | 181 |
| 171. Costa broad, filling 1/4 or more of the leaf base. | <i>Campylopus</i> |
| 171. Costa narrower. | 172 |
| 172. Upper leaf cells densely pluripapillose with C-shaped papillae. | 173 |
| 172. Upper leaf cells smooth or with low, indistinct papillae. | 174 |
| 173. End walls of basal cells thickened; calyptrae large, mitrate and covering capsule. | <i>Encalypta</i> |
| 173. End walls of basal cells not thickened; calyptrae small, cucullate. | <i>Tortula</i> |
| 174. Cells smooth, lax, thin-walled, hexagonal to rhombic. | 175 |
| 174. Cells obscurely papillose, firm-walled, rounded to quadrate. | 177 |
| 175. Leaves not bordered. | <i>Stegonia</i> |
| 175. Leaves bordered. | 176 |
| 176. Plants usually epiphytic; capsules erect. | <i>Brachymenium</i> |
| 176. Plants terrestrial or saxicolous; capsules inclined. | <i>Bryum</i> |
| 177. Plants occurring on trees. | <i>Orthotrichum</i> |
| 177. Plants occurring on rocks and soil. | 178 |
| 178. Perichaetial leaves differentiated in size and shape; capsules immersed; cells of nerve in section more or less homogeneous. | <i>Schistidium</i> |
| 178. Perichaetial leaves similar to upper vegetative leaves; capsule immersed or exserted; nerve with differentiated cells. | 179 |
| 179. Calyptrae scarcely longer than the operculum, cucullate or mitrate, smooth; upper leaves not deeply longitudinally plicate above. | <i>Grimmia</i> |
| 179. Calyptrae large, plicate, covering the capsule to the middle or below, campanulate-mitrate; upper leaves with one deep longitudinal fold on each side above. | <i>Coscinodon</i> |
| 181. Costa very broad, occupying 1/3-1/2 the leaf base and filling the subula (plants entirely acrocarpous). | 181a |
| 181. Costa narrower, or if broad then ending below the leaf apex and not filling it (or if broad then pleurocarpous). | 187 |
| 181a. Dark green to blackish clusters in running water; leaves with a thick border. | <i>Cinclidotus</i> |
| 181a. Plants not in running water; leaves not with a thick border. | 181b |
| 181b. Leaves lingulate or lingulate-lanceolate with rounded apices. | <i>Meesia</i> |

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| 181b. Leave apices not rounded. | 182 |
| 182. Alar cells well differentiated. | 183 |
| 182. Alar cells poorly differentiated. | 185 |
| 183. Costa without guide cells or stereids, in transverse section with a median layer of green cells enclosed dorsally and ventrally with hyaline cells. | <i>Paraleucobryum</i> |
| 183. Costa nearly always with guide cells and stereids, without enclosed green cells. | 184 |
| 184. Inner basal cells of leaf pale, enlarged, and broadly rectangular, extending upward along the costa; capsules smooth; annuli none; calyptrae not fringed. | <i>Dicranodontium</i> |
| 184. Inner basal cells not conspicuously differentiated along the costa; capsules furrowed; annuli compound; calyptrae usually fringed. | <i>Campylopus</i> |
| 185. Leaf lamina bistratose above; cells bulging; margin usually serrate above. | <i>Timmia</i> |
| 185. Lamina not bistratose with bulging cells. | 186 |
| 186. Capsules with a neck at least as long as the urn; costa filling no more than 1/3 of the leaf base. | <i>Trematodon</i> |
| 186. Capsules with a short, inconspicuous neck; costa filling 1/3 or more of the leaf base. | 186a |
| 186a. Leaves ventrally at the base with 1 - 2, about 60 - 80 µm long, usually 2- 3-celled club shaped, reddish hairs; nerve without stereids, in the middle in cross section with large cells | <i>Leptobryum</i> |
| 186a. Leaves without hairs of the above kind at the base. | 186b |
| 186b. Nerve in section without stereids. | <i>Campylopus</i> |
| 186b. Nerve in section with stereids. | 186c |
| 186c. Cells of the uppermost ventral layer of nerve about as large or larger than the cells of the layer below; stereids only dorsal. | <i>Campylopus</i> |
| 186c. Nerve not with two uppermost layers of cells of about the same size. | 186d |
| 186d. Cells with thick walls, at the shoulder of leave short and very irregularly shaped; nerve with two stereid bands, only just about 1/3 of leave base; plants tomentose. | <i>Ditrichum</i> |
| 186d. Cells at the shoulder not irregular. | 186e |
| 186e. Plants dioecous, not tomentose below. | <i>Dicranella</i> |
| 186e. Plants autoecious, tomentose below. | <i>Atractylocarpus</i> |
| 187. Plants pleurocarpous (sporophytes lateral); stems mostly prostrate with lateral branches, often mat- forming, or stems prostrate with erect branches bearing terminal sporophytes (cladocarpous). | 188 |
| 187. Plants acrocarpous (sporophytes terminal); stems erect, not branched or occasionally branched beneath inflorescences. | 280 |

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| 188. Margin of leave 2 - multilayered, thickened; mostly aquatic plants. | 188a |
| 188. Margin not 2 - multilayered | 188b |
| 188a. Cells strongly papillose. | <i>Dialytrichia</i> |
| 188a. Cells not or indistinctly papillose. | <i>Cinclidotus</i> |
| 188b. Leaves bordered by elongate cells, sharply differentiated from shorter inner cells. | 189 |
| 188b. Leaves not bordered by elongate cells. | 191 |
| 189. Leaves lanceolate; shoots to 10 mm; very rare in Ireland | <i>Daltonia</i> |
| 189. Leaves ovate; shoots to 20 mm; very rare in the northern Alps | <i>Distichophyllum</i> |
| 191. Leaf cells papillose or prorulose. | 192 |
| 191. Leaf cells smooth. | 205 |
| 192. Leaves rugose and plicate. | <i>Rhytidium</i> |
| 192. Leaves not rugose, rarely plicate. | 193 |
| 193. Leaf cells pluripapillose. | 194 |
| 193. Leaf cells unipapillose or prorulose. | 198 |
| 194. Papillae arranged in a row over the cell lumina; cells longer than 3:1; plants soft, bright green (when alive); leaves lanceolate, smooth, not cordate. | <i>Barbella</i> |
| 194. Papillae randomly arranged over the cells; cells more or less isodiametric. | 196 |
| 196. Leaf apices fragile. | <i>Haplohymenium</i> |
| 196. Leaf apices not fragile; leaves loosely erect to contorted; marginal basal cells rounded, papillose; sporophytes lateral. | <i>Anomodon</i> |
| 198. Cells unipapillose over the lumina; costa pellucid; stem leaves usually with almost piliform acumen; leaves serrate; leave cells unipapillose except at the margins. | <i>Claopodium</i> |
| 198. Cells prorulose. | 201 |
| 201. Leaf cells short, 1-3:1. | 202 |
| 201. Leaf cells more than 5:1. | 204 |
| 202. Leaves appressed when dry, wide-spreading when moist; perichaetial leaves strongly differentiated; capsules immersed. | <i>Cryphaea</i> |
| 202. Leaves little altered when moist; perichaetial leaves scarcely differentiated; capsules exerted. | <i>Lescuraea</i> |
| 204. Leaves longly decurrent; setae rough; capsules inclined; plants largely terrestrial. | <i>Bryhnia</i> |
| 204. Leaves not decurrent; setae smooth; plants mostly epiphytic or saxicolous. | |
| 204a. Leaves with an opaque group of alar cells. | <i>Isothecium</i> |
| 204a. Leaves with alar cells not opaque. | <i>Scorpiurium</i> |

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| 205. Leaf apices rounded-obtuse to truncate. | 207 |
| 205. Leaf apices acuminate to bluntly acute. | 212 |
| 207. Upper leaf cells less than 3:1. | 208 |
| 207. Upper leaf cells (not apical ones) more than 5:1. | 209 |
| 208. Plants strongly complanate, shiny, little altered when moist. | <i>Homalia</i> |
| 208. Plants at best weakly complanate, dull, strongly incurved when dry, erect when moist. | <i>Leptodon</i> |
| 209. Alar cells inflated. | 210 |
| 209. Alar cells not at all inflated. | 211 |
| 210. Plants strongly julaceous; leaves concave; occurring in or near streams. | <i>Scleropodium</i> |
| 210. Plants with loosely spreading leaves; leaves only slightly concave; occurring in fens. | <i>Calliergon</i> |
| 211. Costa ending in a spine. | <i>Platyhypnidium</i> |
| 211. Costa not projecting at apex. | <i>Hygrohypnum</i> |
| 212. Upper leaf cells 1-2:1. | 218 |
| 212. Upper leaf cells more than 5:1. | 228 |
| 218. Costa ending in the leaf apex. | 219 |
| 218. Costa ending well below the leaf apex. | 225 |
| 219. Upper leaf cells thick-walled, rounded-quadrate to elliptic. | 220 |
| 219. Upper leaf cells firm-walled, short-oblong to rhombic. | 222 |
| 220. Plants with clusters of axillary brood branchlets. | <i>Leskeella</i> |
| 220. Plants without brood branchlets; alar cells restricted in 5-6 rows along the margins, not reaching the costa; inner basal cells long rectangular; peristome yellow. | <i>Pseudoleskeella</i> |
| 222. Costa relatively narrow, less than 35 µm wide at base; plants terrestrial. | <i>Amblystegium</i> |
| 222. Costa relatively broad, mostly more than 50 µm at base; plants aquatic. | <i>Hygroamblystegium</i> |
| 225. Leaves acuminate, often homomallous. | <i>Pseudoleskeella</i> |
| 225. Leaves bluntly acute. | 226 |
| 226. Leaves obliquely asymmetric at tip; exostome teeth cross-striate. | <i>Myrinia</i> |
| 226. Leaves symmetric; exostome teeth rudimentary. | <i>Clasmatodon</i> |
| 228. Leaf margins revolute nearly throughout, serrate above, often with reflexed teeth; costa often with supplementary costae. | <i>Antitrichia</i> |
| 228. Plants without revolute, serrate margins whose teeth are often reflexed. | 232 |
| 232. Plants aquatic, coarse; costa broad, more than 100 µm wide at base, bluntly excurrent. | <i>Hygroamblystegium</i> |
| 232. Plants of various habitats; costa much narrower, ending below | 234 |

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| the apex to excurrent, if excurrent then finely so. | |
| 234. One side of stems for entire length covered by reddish rhizoidal tomentum; leaves strongly plicate. | <i>Tomentypnum</i> |
| 234. Tomentum, if present, restricted to extreme base of stems; leaves plicate or not. | 235 |
| 235. Leaves falcate-secund. | 236 |
| 235. Leaves straight. | 250 |
| 236. Stems with a hyalodermis. | 237 |
| 236. Stems without a hyalodermis. | 239 |
| 237. Leaves strongly plicate, distinctly denticulate in upper portion. | <i>Sanionia</i> |
| 237. Leaves striolate to plane, entire to slightly denticulate. | 238 |
| 238. Alar cells inflated; plants occurring in streams. | <i>Hygrohypnum</i> |
| 238. Alar cells poorly differentiated; plants occurring in rich fens. | <i>Limprichtia</i> |
| 239. Plants of upland habitats; leaves plicate. | <i>Brachythecium</i> |
| 239. Plants of wet habitats; leaves not plicate. | 240 |
| 240. Leaves keeled, distinctly to obscurely 3-ranked; endostome segments joined at tips. | <i>Dichelyma</i> |
| 240. Leaves not keeled or 3-ranked; endostome segments free. | 241 |
| 241. Costa excurrent. | 242 |
| 241. Costa subpercurrent. | 244 |
| 242. Alar cells poorly differentiated. | |
| | <i>Drepanocladus</i> |
| 242. Alar cells abruptly inflated. | 243 |
| 243. Leaf margins entire. | <i>Drepanocladus</i> |
| 243. Leaf margins finely denticulate. | <i>Warnstorfia</i> |
| 244. Leaf margins finely denticulate at apex. | <i>Warnstorfia</i> |
| 244. Leaf margins entire throughout. | 245 |
| 245. Plants on rocks in mountain streams. | <i>Hygrohypnum</i> |
| 245. Plants in fens and seeps, not on rocks. | 246 |
| 246. Cells in lower half of leaf porose; plants of the arctic. | <i>Loeskypnum</i> |
| 246. Cells not porose except at extreme insertion; plants widespread. | 247 |
| 247. Stems with central strand. | <i>Drepanocladus</i> |
| 247. Stems without central strand. | <i>Hamatocaulis</i> |
| 250. Leaf cells long hexagonal, mostly smaller or up to 8:1. | 251 |
| 250. Leaf cells linear, more than 10:1. | 258 |
| 251. Leaves broadly ovate to wider than long, deeply concave, obtuse or with tiny apiculus, imbricate; plants light to silvery green; northern Russia. | <i>Myuroclada</i> |
| 251. Leaves lanceolate to ovate, concave or not; widespread. | 252 |

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| 252. Uniseriate and shortly fusiform gemmae often present. | 252a |
| 252. Without gemmae. | 253 |
| 252a. Epiphytic; gemmae stem born. | <i>Habrodon</i> |
| 252a. Saxicolous; gemmae near leaf apex. | <i>Amblystegium</i> (<i>Conardia</i>) |
| 253. Leaf margins mostly serrate; leaf apices piliferous; peristome single to absent. | <i>Fabronia</i> |
| 253. Leaf Margins \pm entire, denticulate; apex not piliferous. | 254 |
| 254. Leaves soft, concave, ovate with short blunt point; nerve faint, extending to 1/3 (-2/3) way up leaf; inner peristome finely papillose in its upper part, densely horizontally striate below; epiphytic in wet or moist habitats; (autoecious). | <i>Myrinia</i> |
| 254. Not this combination of characters | 255 |
| 255. Exostome teeth papillose throughout, reflexed when dry; leaves entire; epiphytic; (autoecious). | <i>Anacamptodon</i> |
| 255. Peristome single or double, not reflexed | 256 |
| 256. Plants slender, epiphytic; leaves imbricate, dense; nerve c. 1/2 up leaf; peristome single (or rudimentarily double); (autoecious). (Rare in Spain and Portugal; (only?)) | <i>Clasmatodon</i> |
| 256. Not this combination of characters | 257 |
| 257. Nerve 2/3 – 3/4 up leaf; peristome double; capsules erect; (autoecious); on wet schistose rock in the Apuanian Alps (Italy). | <i>Helicodontium</i> |
| 257. Not this combination of characters. | 257a |
| 257a. Leaves appressed and imbricate when dry; upper leaf cells thick walled with rounded ends; small or minute plants; dry places; (dioecious). | <i>Pseudoleskeella</i> |
| 257a. Leaf cells not thick walled with rounded ends. | 257b |
| 257b. Basal and angular cells small, opaque, forming a distinct group; seta smooth; (dioecious). | <i>Isothecium</i> |
| 257b. Angular cells not opaque. | 257c |
| 257c. Plant when dry with branches curved downwards; alar group extending 20 – 40 % up leaf margin; (dioecious). | <i>Scorpiurium</i> |
| 257c. Branches not curved downwards and alar group not extending more than 20 – 40 % up leaf. | 257d |
| 257d. Plants slender to large, often with \pm flattened shoots and branches; mid leaf cells of stem leaves 40 – 120 μm long; nerve (60-) 65 – 115 μm wide near base; leaf margin usually entire; in damp habitats; (autoecious). | <i>Leptodictyum</i> |
| 257d. Shoot usually not flattened. | 257e |
| 257e. Lid of capsule conical. | 257f |
| 257e. Lid of capsule with long beak. | 257g |
| 257f. Plants of mesic or wet habitats; stomata long pored; | <i>Amblystegium</i> |

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| (autoecious). | |
| 257f. Plants usually in dry habitats; stomata round pored; (autoecious or dioecious). | <i>Brachythecium</i> |
| 257g. Stem leaves narrowly triangular to lanceolate – triangular, not concave; plants small or minute; (autoecious or dioecious). | <i>Rhynchostegiella</i> |
| 257g. Stem leaves ovate – lanceolate to broadly ovate; usually not concave; plants slender to robust; (autoecious). | <i>Rhynchostegium</i> |
| 258. Plants attached to rocks in fast-flowing streams and beside waterfalls. | <i>Platyhypnidium</i> |
| 258. Plants in various habitats but not on rocks in fast-flowing water. | 259 |
| 259. Plants terrestrial, large, coarse, erect; stems pinnately branched; Stem leaves ovate-oblong, abruptly apiculate, not plicate . | <i>Pseudo-scleropodium</i> |
| 259. Plants various, prostrate to ascending, if erect then in wetlands; branching various. | 261 |
| 261. Leaves plicate. | 262 |
| 261. Leaves not plicate. | 265 |
| 262. Branches curved-ascending when dry. | <i>Homalothecium</i> |
| 262. Branches prostrate. | 263 |
| 263. Leaf apices coarsely serrate; upper leaf cells thick-walled; alar cells well differentiated, quadrate; plants rigid. | <i>Palamocladium</i> |
| 263. Leaf apices entire to serrulate; upper leaf cells firm-walled; alar cells mostly differentiated, short-rectangular; plants soft. | <i>Brachythecium</i> |
| 265. Plants terete, at least at apex; leaves broadly oblong to ovate, concave to cucullate. | 266 |
| 265. Plants with spreading leaves; leaves lanceolate, not or scarcely concave. | 272 |
| 266. Leaves abruptly acuminate. | 267 |
| 266. Leaves broadly acute to obtuse, sometimes with a minute apiculus. | 269 |
| 267. Costa with one or more spines at the tip. | <i>Scleropodium</i> |
| 267. Costa without spines at tip. | 268 |
| 268. Dioecious; leaf apex filiform, flat. | <i>Cirriphyllum</i> |
| 268. Autoecious; leaf apex not filiform. | <i>Rhynchostegium</i> |
| 269. Leaves with minute apiculus. | 270 |
| 269. Leaves not apiculate. | 271 |
| 270. Plants reddish; basal leaf cells not porose. | <i>Sarmenthypnum</i> |
| 270. Plants green; basal leaf cells \pm porose. | 270a |
| 270a. Cells in the middle of the leaf strongly incrassate and porose. (Scandinavia) | <i>Loeskyphnum</i> |
| 270a. Cells in the middle not strongly incrassate and porose. (Widespread) | <i>Rhynchostegium</i> |

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| 271. Leaves obtuse; plants occurring in fens and swamps; widespread. | <i>Calliergon</i> |
| 271. Leaves broadly acute. | 271a |
| 271a. Dioecious; lid conic. | <i>Scleropodium</i> |
| 271a. Autoecious; lid rostrate | <i>Rhynchostegium</i> |
| 272. Branch leaves with apical cells about 1/2 the length of those at midleaf. | <i>Eurhynchium</i> |
| 272. Branch leaves with apical cells scarcely shorter than those at midleaf. | 274 |
| 274. Leaves with channeled leaf apices from a concave base, with a narrow insertion. | <i>Campylium</i> |
| 274. Leaves without channeled leaf apices, the leaf base not concave or with a narrow insertion. | 276 |
| 276. Branch and stem leaves strongly differentiated; opercula long rostrate. | <i>Eurhynchium</i> |
| 276. Branch and stem leaves scarcely differentiated; opercula conic to apiculate. | 276a |
| 276a. Costa indistinct at midleaf, not toothed; setae smooth; propagula uniseriate, often formed on back of costa at apex. | <i>Amblystegium</i> (<i>Conardia</i>) |
| 276a. Costa distinct throughout; propagula not present. | 277 |
| 277. Costa percurrent or nearly so. | <i>Brachythecium</i> |
| 277. Costa ending well below leaf apex. | 278 |
| 278. Leaves wide-spreading with entire margins; stems complanate-foliate, plants occurring in wet habitats. | <i>Leptodictyum</i> |
| 278. Stems not complanate-foliate; margin rarely entire. | 279 |
| 279. Stem leaves narrowly triangular to lanceolate – triangular, not concave; plants small or minute; lid of capsule rostrate; (autoecious or dioecious). | <i>Rhynchostegiella</i> |
| 279. Leaves ovate, ovate lanceolate or triangular, usually concave | 279a |
| 279a. Lid rostrate; plants autoecious. | <i>Rhynchostegium</i> |
| 279a. Lid conical; autoecious or dioecious. | <i>Brachythecium</i> |
| 280. Capsules large, sessile, oblique, asymmetric; leaves 2 - 3-stratose; cells papillose. | <i>Diphyscium</i> |
| 280. Capsules smaller, usually exserted, symmetric. | 281 |
| 281. Costa ridged at back. | 282 |
| 281. Costa smooth or toothed at back, not ridged. | 283 |
| 282. Leaf cells rounded-oblate. | <i>Dryptodon</i> |
| 282. Leaf cells long-rectangular, more than 5:1. | 282a |
| 282a. Nerve in section with stereids | <i>Dicranum</i> (incl. <i>Orthodicranum</i>) |
| 282a. Nerve in section without stereids, middle layer with chlorophyllose cells. | <i>Paraleucobryum</i> |

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| 283. Conspicuous clusters of dark rhizoids obscuring the stem. | 284 |
| 283. Rhizoids inconspicuous or if obvious, never obscuring the stem. | 287 |
| 284. Leaf cells strongly unipapillose on both surfaces. | <i>Aulacomnium</i> |
| 284. Leaf cells smooth or prorulose. | 285 |
| 285. Leaves narrowly lanceolate from an ovate base. | <i>Anacolia</i> |
| 285. Leaves ovate to broadly elliptic. | 286 |
| 286. Rhizoidal (macronematal) initials in longitudinal rows; endostome fused into a dome. | <i>Cinclidium</i> |
| 286. Rhizoidal initials not in longitudinal rows; endostome segments free. | <i>Rhizomnium</i> |
| 287. Margin of leave 2 - multilayered, thickened, entire; nerve with two stereid bands; stem without central strand; (mostly aquatic plants). | 287a |
| 287. Margin if 2 - multilayered either not entire, or if entire either without two stereid bands or stem without a central strand. | 287b |
| 287a. Cells strongly papillose. | <i>Dialytrichia</i> |
| 287a. Cells not or indistinctly papillose. | <i>Cinclidotus</i> |
| 287b. Plants blackish, occurring on wet rocks usually near streams or the sea, never with propagula. | 289 |
| 287b. Plants greenish, occurring in various habitats, rarely on wet rocks by streams, with or without propagula. | 290 |
| 289. Leaf margins incurved. | <i>Grimmia</i> |
| 289. Leaf margins plane to recurved. | <i>Schistidium</i> |
| 290. Hyaline basal cells extending up the margins farther than at the costa, forming a V-shaped area. | 292 |
| 290. Hyaline basal cells if present extending more or less equally up the margins as costa or farther up the costa. | 293 |
| 292. Leaves squarrose-recurved from an erect base when moist; leaf margins serrulate above; sporophytes lateral. | <i>Pleurochaete</i> |
| 292. Leaves erect-spreading to spreading from an erect base when moist; leaf margins entire to notched; sporophytes terminal. | <i>Tortella</i> |
| 293. Plants glaucous, bluish-green. | <i>Saelania</i> |
| 293. Plants not glaucous or bluish. | 294 |
| 294. Leaves bordered by 2 or more rows of elongate cells. | 294a |
| 294. Leaves unbordered or if bordered then by only a single row of somewhat elongate cells, or by short cells. | 309 |
| 294a. Leaf cells strongly papillose; costa with one stereid band; hydroid strand of cost present. | <i>Henediella</i> |
| 294a Leaf cells smooth, bulging or prorulose | 295 |
| 295. Leaf margins entire. | 296 |
| 295. Leaf margins toothed, sometimes obscurely so. | 301 |

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| 296. Capsules erect. | <i>Entosthodon</i> |
| 296. Capsules inclined to pendulous. | 296a |
| 296a. Leaf cells above about 3:1 or longer. | 297 |
| 296a. Leaf cells above 1-2:1. | 298 |
| 297. Leaf cells in oblique rows; leaves rounded-obtuse, bluntly apiculate. | <i>Pseudobryum</i> |
| 297. Leaf cells not in obvious rows; leaves various. | <i>Bryum</i> |
| 298. Rhizoidal (macronematal) initials in longitudinal rows; endostome fused to a dome. | <i>Cinclidium</i> |
| 298. Rhizoidal initials not in longitudinal rows; endostome segments free. | 299 |
| 299. Reddish colour present on stem and cell walls; leaf border strong, partly bi- to multistratose below (unistratose in the very rare <i>R. gracile</i>) | <i>Rhizomnium</i> |
| 299. No reddish colour present; leaf border unistratose. | 299a |
| 299a. Plants prostrate, mostly in wet places; leaves green. | <i>Plagiomnium</i> |
| 299a. Plants erect-arcuate, mostly on cliffs, leaves bluish. | <i>Cyrtomnium</i> |
| 301. Leaf margins with paired teeth. | 302 |
| 301. Leaf margins with single teeth. | 304 |
| 302. Leaf cells strongly bulging. | <i>Trachycystis</i> |
| 302. Leaf cells flat. | 303 |
| 303. Some leaves with low, inconspicuous lamellae; costa in transverse section with two stereid bands; peristome of 32 small teeth attached at tips to a tympanum. | <i>Atrichum</i> |
| 303. No leaves with lamellae; costa with or without a single stereid band; exostome of 16 free teeth. | <i>Mnium</i> |
| 304. Peristome rudimentary; capsules erect. | <i>Entosthodon</i> |
| 304. Peristome developed; capsules inclined to pendulous, suberect in <i>Brachymenium</i> . | 305 |
| 305. Leaf cells shorter than 2:1. | <i>Plagiomnium</i> |
| 305. Leaf cells 3:1 or more. | 306 |
| 306. Stems rosulate-foliate, occurring erect from a horizontal underground stem; sporophytes often clustered. | <i>Rhodobryum</i> |
| 306. Stems foliate throughout, without rhizome-like connections between erect stems; sporophytes not clustered. | 307 |
| 307. Leaf cells in oblique rows; leaves rounded-obtuse, apiculate. | <i>Pseudobryum</i> |
| 307. Leaf cells not in obvious rows; leaves broadly acute to acuminate. | 308 |
| 308. Capsules erect and symmetric; endostome with a high basal membrane, segments lacking or rudimentary, cilia absent. | <i>Brachymenium</i> |
| 308. Capsules inclined and asymmetric; endostome with a keeled | <i>Bryum</i> |

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| basal membrane, keeled and perforate segments, and usually with cilia. | |
| 309. Leaf margins with paired teeth. | 311 |
| 309. Leaf margins with single teeth or entire. | 315 |
| 311. Leaf cells smooth; leaves elliptic to ovate-elliptic. | Mnium |
| 311. Leaf cells prorulose or with fine cuticular ridges. | 313 |
| 313. Upper leaf cells with cuticular ridges; stems triangular in transverse section. | Plagiopus |
| 313. Upper leaf cells prorulose; stems round in transverse section. | 314 |
| 314. Leaves crispate when dry. | Bartramia |
| 314. Leaves straight when dry. | Philonotis |
| 315. Leaf cells strongly bulging across one or both surfaces, at least in upper part, not papillose. | 316 |
| 315. Leaf cells flat, smooth or papillose, or if bulging then papillose. | 318 |
| 316. Lamina bistratose except along margins; margin of leave usually strongly serrate above, plane. | Timmiella |
| 316. Laminae unistratose, or if bistratose above usually with bistratose margins | 317 |
| 317. Cells in upper part of leave elongate-linear; leaves longitudinally plicate. | Breutelia |
| 317. Cells in upper part of leave quadrate or shortly rectangular; leaves not longitudinally plicate | 317a |
| 317a. Plants with sheathing leaf bases; leaves acute or acuminate at apex. | Timmia |
| 317a. Plants without sheathing leaf bases. | 317b |
| 317b. Leaves elongate-oblong, blunt or obtuse at apex; with yellow filiform gemmae present in upper part of stem; rare arctic plant. | Bryobrittonia |
| 317b. Leaves not elongate-oblong; usually acuminate. | 317c |
| 317c. Dioecious | 317d |
| 317c. Autoecious | 317e |
| 317d. Leaves \pm narrowly triangular to ovate, erecto-patent, rigid when moist, margin plane, papillose-crenulate above; nerve excurrent in stout point. | Cheilothela |
| 317d. Leaves from erect broad base lanceolate or lingulate, \pm spreading, sometimes squarrose; margin recurved below; stem sometimes with shortly stalked, brown gemmae. | Dichodontium |
| 317e. Capsule smooth; peristome teeth smooth or faintly and irregularly striate; leaves decurrent. | Oreoweisia |
| 317e. Capsule striate; peristome teeth vertically pitted-striate; leaves not decurrent. | 317f |
| 317f. Androecium on short stalk; small plants on usually \pm calciferous | Cnestrum |

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| rocks. | |
| 317f. Androecium unstalked; medium-sized plants preferably on siliceous rocks or soil. | <i>Cynodontium</i> |
| 318. Leaves with abruptly expanded, sheathing leaf bases. | 319 |
| 318. Leaves with leaf bases not or only gradually expanded, rarely sheathing. | 326 |
| 319. Leaf cells papillose (at least on sheath) or prorulose. | 320 |
| 319. Leaf cells smooth. | 321 |
| 320. Leaf cells papillose over the lumina. | <i>Timmia</i> |
| 320. Leaf cells prorulose. | <i>Bartramia</i> |
| 321. Upper leaf cells quadrate; capsules inclined and asymmetric, strumose; | <i>Oncophorus</i> |
| 321. Upper leaf cells short-rectangular. | 323 |
| 323. Awns roughened throughout by projecting cell ends. | <i>Trichodon</i> |
| 323. Awns smooth or only rough at apex. | 324 |
| 324. Capsules with neck as long as or longer than the urn. | <i>Trematodon</i> |
| 324. Capsules with neck much shorter than the urn. | 325 |
| 325. Capsules erect, cylindric, smooth; peristome teeth irregularly perforate or deeply cleft into terete, sometimes filiform divisions. | <i>Ditrichum</i> |
| 325. Capsules inclined, oblong, smooth or furrowed, if erect then furrowed; peristome teeth flat, split 1/2 way down, vertically pitted. | <i>Dicranella</i> |
| 326. Alar cells enlarged, colored, or inflated. | 327 |
| 326. Alar cells scarcely differentiated. | 333 |
| 327. Upper and median leaf cells with coarse, irregular cuticular ridges, resembling papillae in transverse section; capsules cylindric, smooth, erect. | 328 |
| 327. Leaf cells without cuticular ridges; capsules various. | 329 |
| 328. Leaves with clusters of spherical propagula at leaf apex; leaf margins bistratose. | <i>Grimmia</i> |
| 328. Leaves without propagula; leaf margins unistratose. | <i>Dicranoweisia</i> |
| 329. Costa with 2 stereid bands. | <i>Dicranum</i> (incl. <i>Orthodicranum</i>) |
| 329. Costa without stereids. | 330 |
| 330. Capsules curved, strumose; plants on alpine rocks. | <i>Kiaeria</i> |
| 330. Capsules erect, not strumose; plants widespread. | 331 |
| 331. Capsules cylindric; plants usually terrestrial or on tree trunks, rarely on rock. | <i>Dicranum</i> (incl. <i>Orthodicranum</i>) |
| 331. Capsules short, obovoid to pyriform; plants on rocks. | 332 |
| 332. Capsules ribbed when dry; peristome vertically pitted-striolate below. | <i>Arctoa</i> |

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| 332. Capsules smooth when dry; peristome papillose. | <i>Blindia</i> |
| 333. Leaf cells smooth (except on the strongly revolute margin in <i>Hilpertia</i>). | 335 |
| 333. Leaf cells papillose or prorulose. | 398 |
| 335. Leaves ovate to obovate, broadly obtuse, with the costa ending below the leaf apex. | 337 |
| 335. Leaves linear, ovate-lanceolate, ligulate to ovate, acuminate to acute or awned, with costa ending below the apex to excurrent. | 342 |
| 337. Plants with large, multicellular propagula in leaf axils; leaves obovate, with cilia on the basal margins. | <i>Oedipodium</i> |
| 337. Plants without axillary propagula; leaves ovate to spatulate, eciliate. | 338 |
| 338. Abaxial laminal cell walls thicker than on adaxial side; costa excurrent as a hyaline awn; capsule erect; peristome absent or rudimentary or 32 teeth twisted counterclockwise. | 338a |
| 338. Cell walls not thickened an abaxial side; if capsule erect then costa not excurrent as hyaline awn. | 339 |
| 338a. Plants small and bulbiform; leaves concave and imbricate; adaxial costal outgrowths present as a pad of cells (= strongly bulging ventral epidermis); leaf margin broadly recurved to revolute; upper laminal cell walls yellow in 2 % KOH. | <i>Stegonia</i> |
| 338a. Plants not bulbiform, no adaxial costal outgrowths present (= ventral epidermis not strongly bulging); leaf margin strongly revolute (to 2 times); upper laminal cell walls red in 2 % KOH. | <i>Hilpertia</i> |
| 339. Leaf cells short-rectangular, lax; capsules erect. | 340 |
| 339. Leaf cells long-hexagonal; capsules inclined to pendulous. | 341 |
| 340. Apical marginal leaf cells short-rhombic, oblong- hexagonal internally; capsules without a distinct neck. | <i>Splachnobryum</i> |
| 340. Apical marginal leaf cells laxly rectangular, similar to internal ones; capsules with well differentiated neck; plants northern. | <i>Tayloria</i> |
| 341. Plants yellowish-green, terete; upper leaf cells long, 7-9:1. | <i>Anomobryum</i> |
| 341. Plants reddish or green, not terete; upper cells shorter, 2-6:1. | 341a |
| 341a. Stem epidermis with hyalodermis. | <i>Pseudobryum</i> |
| 341a. Stem without hyalodermis. | 341b |
| 341b. Some cells of old plants change colour to bluish-green when wetted; margin of leaf irregularly serrate in upper leaf. | <i>Mnium</i> |
| 341b. Cells of old plants without colour change to bluish-green. | 341c |
| 341c. Capsules terminal. | <i>Bryum</i> |
| 341c. Capsules lateral. | <i>Mielichhoferia</i> |
| 342. Leaves oblong, lingulate to ovate. | 343 |
| 342. Leaves lanceolate to linear. | 368 |

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| 343. Leaf cells rounded to quadrate, more or less isodiametric. | 344 |
| 343. Leaf cells short-rectangular to linear. | 353 |
| 344. Leaf bases with abruptly differentiated, hyaline cells (cancellinae); leaf apices often with propagula. | <i>Calymperes</i> |
| 344. Leaf bases without cancellinae although sometimes gradually hyaline; leaf apices without propagula. | 345 |
| 345. Costa excurrent to ending in the cusp; leaf apex cuspidate to piliferous. | 346 |
| 345. Costa subpercurrent; leaf apex broadly acute or obtuse to rarely mucronate. | 349 |
| 346. Leaf apices piliferous. | <i>Desmatodon</i> |
| 346. Leaf apices cuspidate. | 347 |
| 347. Plants with rhizoidal tubers; capsules unknown. | <i>Tortula (Chenia)</i> |
| 347. Plants lacking tubers, widespread in the north; capsules exerted; 0.4-0.8 mm long, obovoid; spores more than 20 µm in diameter; peristome absent or rudimentary. | <i>Pottia</i> |
| 349. Peristome teeth four; propagula cups borne on apices of sterile shoots. | <i>Tetraphis</i> |
| 349. Peristome teeth 16; propagula cups absent. | 350 |
| 350. Leaves homomallous, broadly oblong to oblong-ovate, subacute to obtuse. | <i>Aulacomnium</i> |
| 350. Leaves not homomallous, oblong to lanceolate, mucronate to acuminate. | 351 |
| 351. Leaves broadly to narrowly lanceolate; peristome double. | <i>Meesia</i> |
| 351. Leaves broadly oblong to spatulate; peristome single. | 352 |
| 352. Costa in transverse section with 2 stereid bands. | <i>Barbula</i> |
| 352. Costa in transverse section with 1 stereid band. | <i>Scopelophila</i> |
| 353. Plants filiform, julaceous (if costa not excurrent see also <i>Anomobryum</i>). | <i>Aongstroemia</i> |
| 353. Plants coarser, not julaceous. | 354 |
| 354. Seta immersed in leaves, 1 - 2 mm long. (Very rare in Southern Spain). | <i>Goniomitrium</i> |
| 354. Seta exerted, longer than 2 mm. | 354a |
| 354a. Capsules horizontal to pendulous. | 355 |
| 354a. Capsules erect. | 360 |
| 355. Capsules curved, asymmetric. | 356 |
| 355. Capsules straight, symmetric. | 357 |
| 356. Exostome shorter than and alternate with endostome. | <i>Plagiobryum</i> |
| 356. Exostome longer than and opposite to endostome. | <i>Funaria</i> |
| 357. Capsules ovate, less than 1 mm long; stomates none; endostome | <i>Discelium</i> |

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| fused to exostome, cilia none. | |
| 357. Capsules cylindric to ovate, usually longer than 1 mm; stomates present; endostome free of exostome, cilia mostly present. | 358 |
| 358. Leaf cells in oblique rows. | <i>Plagiobryum</i> |
| 358. Leaf cells not in obvious oblique rows. | 358a |
| 358a. Capsules lateral. | <i>Mielichhoferia</i> |
| 358a. Capsules terminal. | 359 |
| 359. Leaf cells 4:1 or less; capsules distinctly terminal. | <i>Bryum</i> |
| 359. Leaf cells 5:1 or longer. | <i>Pohlia</i> |
| 360. Peristome absent. | 361 |
| 360. Peristome present. | 363 |
| 361. Calyptrae 4-angled, sheathing the entire capsule until after dehiscence. | <i>Pyramidula</i> |
| 361. Calyptrae not angled, not sheathing or persistent. | 362 |
| 362. Capsules subcylindric or narrowly pyriform; annuli none; exothecial cells oblong to oblong-linear; calyptrae inflated-cucullate. | <i>Entosthodon</i> |
| 362. Capsules urceolate to broadly pyriform; annuli present; exothecial cells irregularly hexagonal; calyptrae inflated-mitrate. | <i>Physcomitrium</i> |
| 363. Peristome of endostome only, without a center line on the outer surface; capsules lateral. | <i>Mielichhoferia</i> |
| 363. Peristome double or of exostome only, with a center line on the outer surface. | 364 |
| 364. Plants with scarcely differentiated neck. | 365 |
| 364. Plants with well-differentiated neck (apophysis). | 366 |
| 365. Plants of arctic tundra. | <i>Funaria</i> |
| 365. Plants not arctic. | <i>Entosthodon</i> |
| 366. Urns black, sometimes with yellow apophyses. | <i>Tetraplodon</i> |
| 366. Urns and apophyses green to brown. | 367 |
| 367. Setae pale greenish-white, slender; costa filling the acumen. | <i>Splachnum</i> |
| 367. Setae brownish, stout to slender; costa ending below the leaf apex. | <i>Tayloria</i> |
| 368. Leaves conspicuously 4-ranked. | <i>Conostomum</i> |
| 368. Leaves not conspicuously ranked (if 3-ranked see <i>Meesia</i>). | 369 |
| 369. Leaf cells short, 1(-2):1, at least above, rounded to quadrate. | 370 |
| 369. Leaf cells long, (3-)4:1 or longer, rectangular to long-hexagonal. | 386 |
| 370. Perichaetial leaves strongly differentiated, with an awn as long as the lamina; leaves bistratose. | <i>Diphyscium</i> |
| 370. Perichaetial leaves slightly or not differentiated, never long awned; leaves uni- to multistratose. | 371 |

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| 371. Capsules distinctly 8 or 16 ribbed and furrowed. | 372 |
| 371. Capsules smooth or indistinctly furrowed when dry but without distinct ribs. | 378 |
| 372. Calyptrae mitrate. | 373 |
| 372. Calyptrae cucullate. | 375 |
| 373. Calyptrae hairy. | <i>Ulota</i> |
| 373. Calyptrae naked. | 374 |
| 374. Annuli none; calyptrae plicate. | <i>Orthotrichum</i> |
| 374. Annuli compound; calyptrae not plicate. | <i>Brachydontium</i> |
| 375. Setae cyneous; plants rare, forming tight cushions on alpine slopes. | <i>Oreas</i> |
| 375. Setae erect (but sometimes twisted); plants various but not as above. | 376 |
| 376. Capsules abruptly bent at the seta-capsule junction and horizontal, often becoming purple-red when mature. | <i>Ceratodon</i> |
| 376. Capsules erect to suberect and becoming brown when mature. | 377 |
| 377. Peristome teeth divided to half their length; capsules cylindrical to ovate-cylindric, ca. 2 mm long. | <i>Cynodontium</i> |
| 377. Peristome teeth undivided; capsules ovoid, less than 1 mm long. | <i>Rhabdoweisia</i> |
| 378. Capsules with an erect, elongate, well defined neck; peristome double. | <i>Meesia</i> |
| 378. Capsules with a short, inconspicuous neck; peristome single. | 379 |
| 379. Capsules inclined. | 380 |
| 379. Capsules erect. | 381 |
| 380. Capsules less than 1 mm long, black, not strumose; leaf margins unistratose; plants of rich fens. | <i>Catoscopium</i> |
| 380. Capsules 1.5-2.0 mm long, pale, strumose; leaf margins bistratose; plants on moist soil, rocks and logs. | <i>Oncophorus</i> |
| 381. Capsules immersed to short-exserted. | <i>Grimmia</i> |
| 381. Capsules long-exserted. | 382 |
| 382. Calyptrae mitrate. | 383 |
| 382. Calyptrae cucullate, not plicate. | 384 |
| 383. Perichaetial leaves convolutely clasping the seta; calyptrae plicate. | <i>Glyphomitrium</i> |
| 383. Perichaetial leaves not clasping the seta. | 383a |
| 383a. Calyptrae not plicate; plants to 1 - 2 mm. | <i>Campylostelium</i> |
| 383a. Calyptrae plicate; plants 4 mm or higher. | <i>Ptychomitrium</i> |
| 384. Costa with 1 stereid band; leaf margins bistratose. | <i>Trichostomopsis</i> |
| 384. Costa with 2 stereid bands; leaf margins unistratose. | 385 |
| 385. Leaves lanceolate from a somewhat expanded base. | <i>Didymodon</i> |

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| 385. Leaves oblong. | <i>Barbula</i> |
| 386. Leaves subulate. | 387 |
| 386. Leaves acute to acuminate. | 394 |
| 387. Capsules curved and asymmetric. | <i>Dicranella</i> |
| 387. Capsules straight, symmetric, although sometimes inclined to pendulous. | 388 |
| 388. Setae flexuose-curved to cygneous. | 389 |
| 388. Setae straight, but sometimes spirally- twisted. | 392 |
| 389. Setae more 10 mm long; plants more than 5 mm tall; leaves more than 4 mm long; capsules pyriform. | <i>Leptobryum</i> |
| 389. Setae less than 5 mm long; plants less than 3 mm tall; leaves less than 2 mm long; capsules hemispheric; plants perennial, on rock; setae slender, twisted; capsules peristomate. | <i>Seligeria</i> |
| 392. Capsules ovoid; plants on calcareous rocks. | <i>Seligeria</i> |
| 392. Capsules oblong to cylindric; plants generally on soil. | 393 |
| 393. Capsules long cylindric; peristome teeth divided to base, terete, papillose. | <i>Ditrichum</i> |
| 393. Capsules short cylindric; peristome teeth divided half their length, flat, vertically pitted- striolate. | <i>Dicranella</i> |
| 394. Costa occupying 1/2 or more of leaf base; capsules curved and asymmetric, elongate-pyriform from a neck as long as the urn. | <i>Amblyodon</i> |
| 394. Costa occupying less than 1/4 the leaf base; capsules straight and symmetric, without conspicuous neck. | 395 |
| 395. Plants small, less than 2 mm high, gregarious, occurring on calcareous rocks; capsules ovate. | <i>Seligeria</i> |
| 395. Plants larger, mostly more than 5 mm, in tufts occurring on various substrates; capsules cylindric. | 396 |
| 396. Leaves flexuose-twisted when dry; capsules erect. | <i>Orthodontium</i> |
| 396. Leaves erect, little altered when dry; capsules erect or inclined. | 397 |
| 397. Capsules terminal, inclined to pendent; peristome double; leaves usually more than 1 mm long, sometimes with axillary propagula. | <i>Pohlia</i> |
| 397. Capsules appearing lateral, erect; peristome single; leaves less than 1 mm long, never with propagula. | <i>Mielichhoferia</i> |
| 398. Leaves bistratose throughout, ligulate to oblong, obtuse; perichaetial leaves long awned. | <i>Diphyscium</i> |
| 398. Leaves unistratose, or if bistratose then not ligulate to oblong; perichaetial leaves not so differentiated. | 399 |
| 399. Leaf cells rectangular, prorulose; capsules globose, rugulose to furrowed when dry. | 400 |
| 399. Leaf cells rounded-quadrate; uni- to pluripapillose; capsules ovate to cylindric, smooth or furrowed. | 403 |

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| 400. Leaves strongly ranked. | <i>Conostomum</i> |
| 400. Leaves not conspicuously ranked. | 401 |
| 401. Capsules erect, or if pendent then from curvature of seta, symmetric, rugulose when dry; peristome reduced to a low membrane. | <i>Bartramidula</i> |
| 401. Capsules strongly inclined, asymmetric, furrowed; peristome better developed. | 402 |
| 402. Leaves unistratose; plants on soil and rocks in at least periodically wet habitats, often with innovative branches beneath inflorescences. | <i>Philonotis</i> |
| 402. Leaves bistratose at least at margins; plants on banks and cliffs in mesic habitats, without innovative branches. | <i>Bartramia</i> |
| 403. Leaf cells appearing papillose from slightly thickened walls between cells (not prorulose). | 404 |
| 403. Leaf cells papillose over the lumina. | 405 |
| 404. Leaves crispate when dry; capsules long exserted, cylindrical; plants usually occurring on logs. | <i>Dicranoweisia</i> |
| 404. Leaves erect, straight to curved; capsules immersed to short exserted, ovate-cylindrical; plants occurring on rocks. | <i>Grimmia</i> |
| 405. Leaf cells collenchymatous and stellate. | 406 |
| 405. Leaf cells not thickened in the corners or if so merely rounded and not stellate. | 407 |
| 406. Leaf cells unipapillose; leaves not recurved. | <i>Aulacomnium</i> |
| 406. Leaf cells pluripapillose; leaves recurved. | <i>Geheebia</i> |
| 407. Leaves with abruptly differentiated hyaline cells occupying most of the leaf base (cancellinae) and with an intramarginal border of elongate cells (teniolae), at least in lower part of leaf; usually with propagula on leaf apex. | <i>Calymperes</i> |
| 407. Leaves without cancellinae, or if present then never with teniolae; propagula never on leaf apices but sometimes elsewhere on leaves or in axils. | 408 |
| 408. Plants often with propagula borne terminally on specialized stalks from stem apices; cells with central conical papilla. | <i>Aulacomnium</i> |
| 408. Plants with or without various means of asexual reproduction but these never borne on stalks from the stem apices. | 409 |
| 409. Plants occurring on tree trunks or bare rock, with immersed to shortly exserted, often ribbed capsules. | 410 |
| 409. Plants usually occurring on soil, if on rocks or trees then capsules long exserted and mostly unribbed (or plants sterile). | 412 |
| 410. Calyptrae cucullate, not plicate, naked; occurring on wet rocks. | <i>Amphidium</i> |
| 410. Calyptrae mitrate, plicate, usually hairy; occurring on tree trunks and dry rocks. | 411 |
| 411. Leaves usually crispate to contorted when dry; basal marginal | <i>Ulota</i> |

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| cells with thickened transverse walls; stomates superficial; capsules shortly exerted. | |
| 411. Leaves usually little altered when dry; basal marginal cells not differentiated; stomates immersed or superficial; capsules immersed to shortly exerted. | <i>Orthotrichum</i> |
| 412. Costa in transverse-section more or less homogeneous, without differentiated stereids. | 414 |
| 412. Costa in transverse-section with differentiated stereid bands. | 417 |
| 414. Upper leaf cells with 4-7 small, conic papillae. | <i>Zygodon</i> |
| 414. Upper leaf cells with 3 or fewer, simple to branched papillae. | 415 |
| 415. Leaves less than 0.6 mm long, ligulate, rounded- obtuse; rare plants of calcareous rocks; annuli of 2-3 rows of well-differentiated cells. | <i>Gyroweisia</i> |
| 415. Leaves more than (0.7-)1.5 mm long, lanceolate to ovate, acuminate to obtuse; annuli poorly differentiated. | 416 |
| 416. Leaves typically crispate to contorted when dry; basal marginal cells with thickened transverse walls; capsules shortly exerted; calyptrae hairy. | <i>Ulota</i> |
| 416. Leaves usually little altered when dry; basal marginal cells not differentiated; capsules immersed to shortly exerted; calyptrae naked (species with contorted leaves) to hairy (species with unaltered leaves). | <i>Orthotrichum</i> |
| 417. Costa with a single, dorsal stereid band. | 418 |
| 417. Costa with both dorsal and ventral stereid bands. | 429 |
| 418. Calyptrae campanulate-mitrate, covering entire capsule, often lobed at base; basal leaf cells with thickened transverse walls. | <i>Encalypta</i> |
| 418. Calyptrae cucullate, covering only operculum and capsule apex, unlobed at base; basal leaf cells usually without thickened transverse walls. | 419 |
| 419. Leaves linear-lanceolate to lanceolate (ligulate in <i>Leptobarbula</i> , which has plane margins), never with hair points; leaf margins recurved to plane; leaf cells with papillae conic, clavate or branched, rarely C-shaped. | 420 |
| 419. Leaves broadly lanceolate (from revolute leaf margins), lingulate or oblong-ovate, sometimes with hair points; leaf margins recurved to strongly revolute; leaf cells with papillae stellate from a stipitate base to C-shaped. | 425 |
| 420. Leaf cells with 4-7 widely spaced, small, conic papillae; elliptic propagula present in leaf axils; peristome double; plants usually occurring on trees, rarely on rock. | <i>Zygodon</i> |
| 420. Leaf cells with 1-4(-5) closely set, simple to branched papillae; propagula absent; peristome single or absent; plants occurring on soil and rocks. | 421 |
| 421. Leaf margins serrulate above; capsules erect to inclined, often | <i>Cynodontium</i> |

- furrowed and strumose; peristome vertically pitted-striolate.
421. Leaf margins entire; capsules erect, never furrowed or strumose; peristome, when present, papillose. 422
422. Ventral costal epidermis absent; rather deep narrow groove along costa present; perichaetium lateral on main axis at ends of very short branches; stem sclerodermis clearly differentiated **Anoetangium**
422. Ventral costal epidermis usually present; adaxial surface of leaf along costa broadly channelled or flat. 423
423. Stem sclerodermis clearly differentiated. 423a
- 423 Stem sclerodermis not or little differentiated. 423b
- 423a. Perichaetia terminal; papillae absent to large; usually low, simple to bifid. (Usually in dry habitats) **Didymodon (Trichostomopsis)**
- 423a. Perichaetia lateral on main axis at ends of very short branches; papillae usually crowded, low, irregularly scablike. (Usually in wet or seasonally wet habitats) **Molendoa**
- 423b. Stem seldom branching, up to 3 (-5) mm long; leaves usually shorter than 1 mm ;capsule with peristome. **Leptobarbula**
- 423b. Stem branching often, up to 2,7 mm long; leaves usually longer than 1 mm; capsule without peristome. **Gymnostomum**
425. Leaves narrowly lanceolate; leaf margins erect and bistratose. **Trichostomopsis**
425. Leaves oblong, lingulate to ovate; leaf margins plane to revolute, unistratose or if bistratose then always revolute. 426
426. Upper leaf margins broadly revolute to spirally revolute, with cells often more strongly chlorophyllose than median cells. **Pseudocrossidium**
426. Upper leaf margins plane to revolute, with cells undifferentiated or paler than median cells. 427
427. Leaves unbordered; peristome none or rudimentary. **Pottia**
427. Leaves often bordered by smooth cells; peristome present. 428
428. Peristome teeth united in a high or rarely low, tubular basal membrane, spirally twisted above; cells of adaxial (upper) surface of costa similar to or smaller than laminal cells in transverse section. **Tortula**
428. Peristome teeth free or rarely united in a low basal membrane, erect to slightly twisted above; cells of adaxial surface of costa mostly larger than or otherwise differentiated from laminal cells in transverse section. **Desmatodon**
429. Leaf margins abruptly serrate at the shoulder. **Eucladium**
429. Leaf margins entire at shoulders. 430
430. Leaf cells with numerous (more than 7), minute, elliptic papillae over the walls as well as the lumina. **Amphidium**
430. Leaf cells with fewer than 7, larger, round papillae only over the lumina. 431
431. Leaf cells in the upper part mammilose and unipapillose to 432

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| pluripapillose. | |
| 431. Leaf cells plane, pluripapillose. | 434 |
| 432. Dioecious; leaves from erect broad base lanceolate or lingulate, ± spreading, sometimes squarrose; stem sometimes with shortly stalked, brown gemmae. | <i>Dichodontium</i> |
| 432. Autoecious; leaves erect-spreading. | 433 |
| 433. Capsule smooth; peristome teeth smooth or faintly and irregularly striate. | <i>Oreoweisia</i> |
| 433. Capsule striate; peristome teeth vertically pitted-striate. | <i>Cynodontium</i> |
| 434. Stems with central strand. | <i>Bryoerythrophyllum</i> |
| 434. Stems without central strand. | 435 |
| 435. Stems with hyalodermis; adaxial (upper) surface of costa with enlarged, papillose epidermal cells. | <i>Paraleptodontium</i> |
| 435. Stems without hyalodermis; adaxial surface of costa with small, smooth cells. | <i>Leptodontium</i> |
| 436. Leaves at extreme apex with large, curved, projecting papillae. | <i>Dichodontium</i> |
| 436. Leaves at extreme apex with margins entire or papillose-crenulate. | 437 |
| 437. Stems triquetrous, especially when moist; leaf cells unipapillose, the papillae sometimes branched. | <i>Triquetrella</i> |
| 437. Stems without ranked leaves; leaf cells pluripapillose. | 438 |
| 438. Stems without central strand, in transverse section with largest cells in middle of section. | <i>Oxystegus</i> |
| 438. Stems with central strand, or if poorly developed in transverse section at least with largest cells not in middle of stem. | 439 |
| 439. Leaf margins plane to erect. | 440 |
| 439. Leaf margins recurved to revolute, at least near midleaf or below. | 443 |
| 440. Stems with hyalodermis. | <i>Trichostomum</i> |
| 440. Stems without hyalodermis, epidermal cells small. | 441 |
| 441. Stem sclerodermis clearly differentiated; Perichaetium lateral on main axis at ends of very short branches; perichaetial leaves distinctly different in size or morphology; papillae usually crowded, low, irregularly scablike. | <i>Molendoa</i> |
| 441. Stem sclerodermis not or weakly developed; Perichaetium terminal. | 442 |
| 442. Stem seldom branching, up to 3 (-5) mm long; leaves usually shorter than 1 mm; capsule with peristome. | <i>Leptobarbula</i> |
| 442. Stem branching often, up to 2,7 mm long; leaves usually longer than 1 mm; capsule without peristome. | <i>Gymnostomum</i> |
| 443. Peristome none; central strand absent; leaves recurved only on one side. | <i>Hymenostylium</i> |

443. Peristome usually present; central strand usually present. 444
444. Perichaetium lateral on main axis at ends of very short branches; perichaetial leaves distinctly different in size or morphology; papillae usually crowded, low, irregularly scablike. *Molendoa*
444. Perichaetia terminal; papillae not scablike. 444a
- 444a. Axillary hairs with a brown, slender basal cell; laminal cells well defined in surface view; leaves usually lanceolate; cells of abaxial (back) surface of costa quadrate to short-oblong, rarely elongate; basal laminal cells usually little differentiated, green and short-rectangular. *Didymodon*
- 444a. Axillary hairs with all cells hyaline; laminal cells obscure in surface view; leaves usually ovate to oblong; cells of abaxial surface of costa oblong to elongate; basal laminal cells usually strongly differentiated, hyaline and elongate. *Barbula*