Table 4. The 186 morphological/anatomical/chemical characters and 420 character-states to be scored for monocotyledons and non-monocot outgroups. NB: An additional five characters and eight character-states have been added since we submitted the proposal. We expect that, as scoring continues, additional characters and character-states will be inevitably added. The 181 phenotypic characters stated in our proposal should thus be seen as the minimum number we intend to score.

<table>
<thead>
<tr>
<th>Character Code</th>
<th>Character Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>MYCOTROPHY absent present;</td>
</tr>
<tr>
<td>1</td>
<td>ROOT_HAIRS present absent;</td>
</tr>
<tr>
<td>2</td>
<td>ROOT_HAIR_ORIGIN any_cell specialized_cells;</td>
</tr>
<tr>
<td>3</td>
<td>VELAMEN absent present;</td>
</tr>
<tr>
<td>4</td>
<td>LATERAL_ROOTS opposite_xylem opposite_phloem both;</td>
</tr>
<tr>
<td>5</td>
<td>ROOT_VESSELS present absent;</td>
</tr>
<tr>
<td>6</td>
<td>CLADODES absent present;</td>
</tr>
<tr>
<td>7</td>
<td>PACHYCAUL_ROSETTE undeveloped well_developed;</td>
</tr>
<tr>
<td>8</td>
<td>SCLERIFIED_PRIMARY_TISSUE minor extensive;</td>
</tr>
<tr>
<td>9</td>
<td>DIFFUSE_SECONDARY_GROWTH absent present;</td>
</tr>
<tr>
<td>10</td>
<td>STM absent present;</td>
</tr>
<tr>
<td>11</td>
<td>SHOOT_APEX normal sunken;</td>
</tr>
<tr>
<td>12</td>
<td>UNDERGROUND_STEM rhizome corm bulb tuber;</td>
</tr>
<tr>
<td>13</td>
<td>STEM_VESSELS present absent;</td>
</tr>
<tr>
<td>14</td>
<td>STELE eustely atactostely reduced;</td>
</tr>
<tr>
<td>15</td>
<td>SIEVE_ELEMENT_PLASTID_STARCH absent present;</td>
</tr>
<tr>
<td>16</td>
<td>SIEVE_ELEMENT_PLASTID_PROTEIN_FILAMENTS absent present;</td>
</tr>
<tr>
<td>17</td>
<td>SIEVE_ELEMENT_PLASTID_CONCENTRIC_MEMBRANES absent present;</td>
</tr>
<tr>
<td>18</td>
<td>SIEVE_ELEMENT_PLASTID_PROTEIN_CRYSTALS absent present;</td>
</tr>
<tr>
<td>19</td>
<td>RECTANGULAR_PROTEIN_CRYSTALS absent present;</td>
</tr>
<tr>
<td>20</td>
<td>CUNEATE_PROTEIN_CRYSTALS absent present;</td>
</tr>
<tr>
<td>21</td>
<td>HEXAGONAL_PROTEIN_CRYSTALS absent present;</td>
</tr>
<tr>
<td>22</td>
<td>CUBIC_PROTEIN_CRYSTALS absent present;</td>
</tr>
<tr>
<td>23</td>
<td>LATICIFERS absent present;</td>
</tr>
<tr>
<td>24</td>
<td>VEGETATIVE_OXALATE_RAPHIDES absent present;</td>
</tr>
<tr>
<td>25</td>
<td>STYLOIDS absent present;</td>
</tr>
<tr>
<td>26</td>
<td>GROOVED_RAPHIDES absent present;</td>
</tr>
<tr>
<td>27</td>
<td>SILICA absent present;</td>
</tr>
<tr>
<td>28</td>
<td>SILICA_BODIES absent present;</td>
</tr>
<tr>
<td>29</td>
<td>SILICA_BODY_SHAPE druse hat trough spherical cubic;</td>
</tr>
<tr>
<td>30</td>
<td>SILICA_SAND absent present;</td>
</tr>
<tr>
<td>31</td>
<td>DRUSES absent present;</td>
</tr>
<tr>
<td>32</td>
<td>CHLORENCYMA lobed pegged;</td>
</tr>
<tr>
<td>33</td>
<td>BIG_STARCH_GRAINS absent present;</td>
</tr>
<tr>
<td>34</td>
<td>FOLIAR_UV absent present;</td>
</tr>
<tr>
<td>35</td>
<td>VORLUAUFERSPITZE absent present;</td>
</tr>
<tr>
<td>36</td>
<td>LEAF_TYPE simple ensiform scale divided terete reduced;</td>
</tr>
<tr>
<td>37</td>
<td>PTYXIS adplicate supervolute conduplicate plicate involute explicative;</td>
</tr>
<tr>
<td>38</td>
<td>PHYLLOTAXIS spiral ranked;</td>
</tr>
<tr>
<td>39</td>
<td>PETIOLE absent dioscorea alisma bambusa;</td>
</tr>
<tr>
<td>40</td>
<td>STIPULES absent present;</td>
</tr>
<tr>
<td>41</td>
<td>LIGULE absent present;</td>
</tr>
<tr>
<td>42</td>
<td>INTRAVAGINAL_SQUAMULES absent present;</td>
</tr>
<tr>
<td>43</td>
<td>PRIMARY_VENATION palmate pinnate parallel dichotomous;</td>
</tr>
<tr>
<td>44</td>
<td>RETICULATE_VENATION absent present;</td>
</tr>
<tr>
<td>45</td>
<td>PUBESCENCE absent present;</td>
</tr>
<tr>
<td>46</td>
<td>GLANDULAR_HAIRS absent present;</td>
</tr>
</tbody>
</table>
47 LEAF AXIL HAIRS absent present;
48 PETIOLE ASSIMILATING TISSUE peripheral diffuse with veins;
49 LEAF AIR CANALS absent random one arc two or more arcs septate;
50 MESOPHYLL PARENCHYMA BUTTRESES absent present;
51 LEAF VESSELS present absent;
52 LEAF EPIDERMAL CELLS undifferentiated short-long cells;
53 STOMATA anomocytic para or tetracytic absent;
54 OBLIQUE DIVISION present absent;
55 EPICUTICULAR WAX absent present;
56 EPICUTICULAR RODS absent present;
57 EPICUTICULAR ROD MORPHOLOGY triangular coiled polygonal;
58 EPICUTICULAR RODS TRANSVERSELY RIDGED absent present;
59 EPICUTICULAR RODS LONGITUDINALLY AGGREGATED absent present;
60 EPICUTICULAR RODS CLUSTERED absent present;
61 EPICUTICULAR GRANULES absent present;
62 EPICUTICULAR PLATLETS absent present;
63 EPICUTICULAR PLATLET ORIENTATION random rosettes parallel rows;
64 EPICUTICULAR STACKED PLATLETS absent present;
65 EPICUTICULAR TUBULES absent present;
66 EPICUTICULAR TUBULE ORIENTATION random clustered;
67 EPICUTICULAR THREADS absent present;
68 STOMATAL CHIMNEYS absent present;
69 FLOWERS solitary inflorescence;
70 COMPOUND INFLORESCENCE panicle thyrese;
71 ULTIMATE INFLORESCENCE UNIT raceme cyme;
72 MAIN INFLORESCENCE AXIS with terminal flower without terminal flower;
73 SIMPLE INFLORESCENCE raceme head spadix spike;
74 BRACTEOLE normal first tepal;
75 BRACTEOLE POSITION abaxial adaxial;
76 FLORAL UV absorption reflection;
77 FLORAL EXPRESSION monclinous diclinous;
78 DELIQUESCENT FLOWERS absent present;
79 TEPALS SPOTTED absent present;
80 FIRST TEPAL POSITION adaxial abaxial;
81 OUTER PERIANTH present absent;
82 INNER PERIANTH present absent;
83 INNER PERIANTH CONNATION absent present;
84 OUTER PERIANTH CONNATION absent present;
85 OUTER PERIANTH FORM sepaloid petaloid;
86 INNER PERIANTH FORM sepaloid petaloid;
87 PERIANTH CURVATURE absent present;
88 MONOSYMMETRIC OUTER PERIANTH absent present;
89 MONOSYMMETRIC INNER PERIANTH absent present;
90 MONOSYMMETRIC OUTER STAMINAL WHORL absent present;
91 MONOSYMMETRIC INNER STAMINAL WHORL absent present;
92 PERIGONAL NECTARIES absent present;
93 INNER STAMENS zero one two three many;
94 OUTER STAMENS zero one two three many;
95 STAMINODIA absent present;
96 CONNATE STAMEN FILAMENTS absent present;
97 CONNECTIVE PROTRUSION absent present;
98 ANther ATTACHMENT basifixied dorsifixied;
99 ADNATE OUTER STAMENS absent present;
100 ADNATE INNER STAMENS absent present;
ANTHER DEHISCENCE_ORIENTATION introrse extrorse latrorse;
ANTHER DEHISCENCE,longitudinal poricidal;
THECAE_PER_ANTHER two one;
SPORANGIA_PER_THECA two one;
ANTHER_WALL_FORMATION dicotyledonous monocotyledonous;
ENDOTHECIUM_WALL_THICKENINGS spiral girdle_like stellate absent;
EXOTHECIAL absent present;
TAPETUM_TYPE glandular_secretory plasmodial_amoeboid;
MICROSPOROGENESIS successive simultaneous;
POLLEN_UNITS monads tetrads dyads;
SPIRAPERTURATE absent present;
POLLEN_TYPE inaperturate sulcate porate trichotomosulcate;
SULCI one two three poly;
EXINE present vestigial;
EXINE_PROTUBERANCES absent spinulose-gemmate;
PORATE_POLLEN_OPERCULUM absent present coarse_granules;
SCROBICULI absent present;
Pollen_APERTURE_MARGIN nonannulate annulate;
Pollen_WALL_ULTRASTRUCTURE columellate granular aveolar atectate;
TECTUM_ORNAMENTATION tectate semitectate;
ENDEXINE absent present;
Pollen_NUCLEI two three;
GYNOECIUM_POSITION superior inferior;
PSEUDOMONOMERY absent present;
CARPEL_CONNATION apocarpous syncarpous;
INTRAOVARIAN_MUCILAGE absent present;
STYLES solid hollow;
STYLMAR_APPENDAGES absent present;
STIGMATIC_SURFACE dry wet;
STIGMA symmetric asymmetric;
STIGMA_BRANCHING simple branched;
OVULES_PER_LOCULE one many;
SINGLE_OVULE basal apical median;
PLACEMENT laminar marginal;
SYNCARPIOUS_PLACENTA axile parietal;
SEPTAL_NECTARIES absent internal external;
NUCELLUS crassinucellate teninucellate;
EMBRYOSTEGA absent outer_integument inner_integument both;
ARILS_ETC absent present;
INTEGUMENT_TANNIN absent present;
MICROPYLE endostomic exostomic;
OVULE_TYPE anatropous campylotropous_amphitropous orthotropous;
OVULE_ORIENTATION apotropous epitropous pleurotropous;
APOTROPIC_OVULES vertical pendant horizontal;
EPITROPIC_OVULES vertical pendant horizontal;
PLEUROTROPIC_OVULES inwardly_curved outwardly_curved;
OVULES normal_nucellus massive_nucellus;
NUCELLUS_EPIDERMIS elongated square;
NUCELLUS_SHAPE ovate elliptical;
NUCELLAR_CAP absent present;
EMBRYOSAC DEVELOPMENT monosporic bisporic tetrasporic;
EMBRYOSAC_STARCH small_grains large_grains;
ENDOSPERM_FORMATION cellular nuclear helobial;
EMBRYOGENY onagrad caryophyllad solanad asterad chenopodiad;
HELOBIAL_ENDOSPERM normal haemodore_type;
STARCHY_ENDOSPERM none_or_little abundant;
CHALAZOSPERM absent present;
SUBDERMAL_PERISPERM absent present;
ENDOSPERM absent present;
APOOPCARPOUS_FRUIT_TYPE follicle achene drupe;
VENTRICIDAL_CAPSULES absent present;
LOCULICIDAL_CAPSULES absent present;
SEPTICIDAL_CAPSULES absent present;
PORICIDAL_CAPSULES absent present;
FLESHY_EXOCARP absent present;
FLESHY_MESOCARP absent present;
FLESHY_ENDOCARP absent present;
PHYTOMELAN_SEEDS absent present;
MICROSPERMY absent present;
EMBRYO_TYPE linear lateral capitate broad rudimentary minute;
EMBRYO_AXIS straight curved;
SEEDLINGS dicotyledonous monocotyledonous;
RHIZOIDS absent present;
RADICLE persistent short_lived absent;
COLLAR absent present;
COTYLEDON_TIP nonhaustorial haustorial;
COTYLEDON_SHEATH absent open closed;
COTYLEDON_LIMB present absent;
COTYLEDON_LIGULE_SHEATH open closed;
COTYLEDON_LIGULE absent present;
MEIOSIS normal postreductional;
CENTROMERE localized diffuse;
CHELIDONIC_ACID absent present;
STERIODAL_SAPONINS absent present;
CYANOGNENIC_COMPOUNDS absent present;