Table 1. Taxa included in this study; binomials given only for taxa to be sampled for spikelet modeling or pollen. Family/Grade or Clade/Subfamily (number of taxa to be modeled/number of taxa for pollen study/number of taxa included in the optimizations); ǂ = C4; **†** = no plastome available; *Spikelet* = spikelet to be modeled; **LTS** = pollen of taxa selected for **L**ight**, T**ransmission electron and **S**canning electron microscopy. Habitat: no lines or shading = open; underline = open and edge; open box = edge; shaded box = edge or forest understory; shading only = forest understory.

|  |
| --- |
| Outgroups (0/4/4): |
| Flagellariaceae (0/1/1) – *Flagellaria indica* **TS**  Ecdeiocoleaceae (0/2/2) – *Ecdeiocolea monostachya***† TS***, Georgeantha hexandra***† TS**  Joinvilleaceae (0/1/1) – *Joinvillea ascendens* **TS** |
| Poaceae (27/44/158): |
| APP GRADE (3/6/5)  Anomochlooideae (2/2/2) – *Anomochloa marantoidea* **LTS***, Streptochaeta spicata* **LTS**  Pharoideae (1/2/2) – *Leptaspis zeylanica* **TS***, Pharus latifolius* **LTS**  Puelioideae (0/2/1) – *Puelia sp.* **TS***, Guaduella sp.***† TS** |
| BOP CLADE (12/19/75)  Bambusoideae (2/4/26) – *Acidosasa*, *Arundinaria gigantea* **TS***, Bambusa, Buergersiochloa, Chimonocalamus, Chusquea, Cryptochloa, Diandrolyra, Drepanostachyum, Eremitis, Fargesia, Greslania, Guadua angustifolia* **TS***, Hickelia, Lithachne pauciflora* **LTS***, Neololeba, Olmeca, Olyra, Otatea, Pariana, Phyllostachys, Raddia brasiliensis* **L***, Rhipidocladum, Sasa, Shibataea, Thamnocalamus*  Oryzoideae (2/4/10) – *Ehrharta*, *Ehrharta erecta***†** **LTS***,* *Humbertochloa, Leersia*, *Leersia virginica***†** **L***, Microlaena, Oryza, Potamophila, Prosphytochloa, Rhynchoryza, Streptogyna americana* **TS***, Zizania aquatic* **TS**  Pooideae (8/11/39) – *Aegilops*, *Agrostis, Alopecurus, Anthoxanthum, Avena, Brachyelytrum erectum* **LTS***, Brachypodium distachyon* **TS***, Briza, Bromus, Calamagrostis, Catapodium, Cynosurus, Dactylis, Deschampsia, Diarrhena obovata* **LTS***, Elymus hystrix***†** **L***, Elymus virginicus***†** **L***, Eriocoma, Festuca, Festuca paradoxa***†** **L***, Festuca subverticillata***†** **L***, Glyceria striata***†TS***, Hesperostipa spartea***†TS***, Holcus, Hordeum, Lamarckia, Lolium, Lygeum, Melica, Nardus, Nassella, Oryzopsis, Phaenosperma, Phalaris, Phleum, Piptatherum, Piptochaetium, Poa*, *Poa pratensis***†** **L***, Poa sylvestris***†** **L***, Puccinellia, Secale, Taeniatherum, Torreyochloa, Trisetum, Triticum* |
| PACMAD CLADE (12/19/78)  Panicoideae (7/9/44) – *Alleochaete*, *Alloteropsis,* *Amphicarpum,* ǂ*Arthraxon,* ǂ*Arundinella,* ǂ*Axonopus,* ǂ*Bothriochloa,* ǂ*Capillipedium,* ǂ*Cenchrus, Centotheca lappacea* **LTS***, Chasmanthium sessiliflorum* **LTS,**ǂ*Coix,* ǂ*Coleataenia,* ǂ*Danthoniopsis dinteri* **TS***, Dichaetaria*, *Dichanthelium, Dichanthelium latifolium***†** **L***, Dichanthelium oligosanthes***†** **L***,* ǂ*Digitaria,* ǂ*Diheteropogon,* ǂ*Echinochloa crusgalli* **LTS***,* ǂ*Eriochloa,* ǂ*Eulalia, Gynerium sagittatum* **TS***,* ǂ*Hyparrhenia,* ǂ*Imperata,* ǂ*Ischaemum,* ǂ*Iseilema, Lecomtella,* ǂ*Loudetiopsis,* ǂ*Megathyrsus, Oplismenus, Otachyrium,* ǂ*Panicum virgatum* **LTS***,* ǂ*Paspalum, Plagiantha,* ǂ*Rottboellia,* ǂ*Saccharum,* ǂ*Setaria,* ǂ*Sorghastrum,* ǂ*Sorghum, Steinchisma,* ǂ*Themeda, Thysanolaena,* ǂ*Urochloa,* ǂ*Zea, Zeugites pittieri* **L** *­*  Aristidoideae (1/2/3) – ǂ*Aristida purpurea* **LTS***, Sartidia,* ǂ*Stipagrostis hirtigluma* **TS**  Chloridoideae (2/3/17) – ǂ*Bouteloua curtipendula* **LTS***,* ǂ*Bouteloua gracilis* **L***,*  ǂ*Centropodia glauca* **TS***,* ǂ*Chloris,* ǂ*Dactyloctenium,* ǂ*Distichlis,* ǂ*Eragrostis,* ǂ*Eustachys,* ǂ*Halopyrum,* ǂ*Hilaria,* ǂ*Leptochloa,* ǂ*Neyraudia,* ǂ*Sporobolus,* ǂ*Trichoneura,* ǂ*Triodia,* ǂ*Uniola,* ǂ*Zoysia*  Micrairoideae (0/2/3) – ǂ*Eriachne sp.* **TS***, Isachne, Micraira sp.* **TS**  Arundinoideae (1/2/5) – *Arundo donax* **TS***, Elytrophorus,* *Hakonechloa, Monachather,*  *Phragmites australis* **LTS**  Danthonioideae (1/1/6) – *Chaetobromus,* *Chionochloa, Danthonia, Danthonia spicata***†** **LTS***, Rytidosperma, Tenaxia, Tribolium* |