

## Character List

- #1. Subfamily:/
  - 1. Caesalpinioideae/
  - 2. Mimosoideae/
  - 3. Faboideae/
- #2. Phylogenetic number: /
- #3. Tribe: <of Caesalpinioideae>/
  - 1. Caesalpinieae/
  - 2. Cassieae/
  - 3. Cercideae/
  - 4. Detarieae/
  - 5. Amherstieae/
- #4. Tribe: <of Mimosoideae>/
  - 1. Parkieae/
  - 2. Mimozygantheae/
  - 3. Mimoseae/
  - 4. Acacieae/
  - 5. Ingeae/
- #5. Tribe: <of Faboideae>/
  - 1. Swartzieae/
  - 2. Sophoreae/
  - 3. Dipteryxae/
  - 4. Dalbergieae/
  - 5. Abreae/
  - 6. Amorpheae/
  - 7. Millettieae/
  - 8. Robinieae <including Sesbanieae>/
  - 9. Indigofereae/
  - 10. Phaseoleae/
  - 11. Desmodieae/
  - 12. Psoraleeae/
  - 13. Loteae/
  - 14. Aeschynomeneae/
  - 15. Adesmieae/
  - 16. Galegeae/
  - 17. Carmichaelieae/
  - 18. Hedysareae/
  - 19. Fabeae/
  - 20. Cicereae/
  - 21. Trifolieae/
  - 22. Brongniartieae/
  - 23. Bossiaeeae/
  - 24. Mirbelieae/
  - 25. Podalyrieae/
  - 26. Hypocalypeteae/
  - 27. Crotalarieae/
  - 28. Euchresteae/
  - 29. Thermopsidaeae/
  - 30. Genisteae/
- #6. Subtribe: /
- #7. Group: /

- #8. Species: <studied>/  
studied/
- #9. Species: <in genus>/  
in genus/

#### FRUIT CHARACTERS

- #10. Fruit <recording of morphology>/
  - 1. internal and external morphology recorded/
  - 2. external morphology only recorded/
  - 3. internal morphology only recorded/
  - 4. morphology not recorded/
- #11. Fruit a <type>/
  - 1. legume <including dehiscent and indehiscent 1-seeded fruits>/
  - 2. loment (or a loment segment) <multiseeded, breaking into 1-seeded, usually indehiscent, segments SEE loment characters further back>/
  - 3. nutlet <SEE nutlet characters further back>/
- #12. Fruit <number of locules in legume, 1 or 2>/
  - 1. unilocular/
  - 2. bilocular/
- #13. Fruit <length, from apex to base of fruit>/  
cm long/
- #14. Fruit <width, before dehiscence, at widest part>/  
cm wide/
- #15. Fruit <thickness, before dehiscence, at thickest part>/cm thick/
- #16. Fruit <relationship of length to width>/
  - 1. length less than twice as long as width/
  - 2. 2-9 times longer than wide/
  - 3. more than 9 times longer than wide/
  - 4. wider than long/
- #17. Fruit with <occurrence of androecial sheath>/
  - 1. persistent androecial sheath/
  - 2. deciduous androecial sheath/
- #18. Fruit with <occurrence of corolla>/
  - 1. persistent corolla/
  - 2. deciduous corolla/
- #19. Fruit with <part of corolla persisting>/
  - 1. keel/
  - 2. standard/
  - 3. various petals/
- #20. Fruit with <calyx>/
  - 1. persistent calyx/
  - 2. deciduous calyx/
- #21. Fruit with calyx <relative length of fruit to calyx>/
  - 1. longer than fruit/
  - 2. equal in length to fruit/
  - 3. shorter than fruit/
- #22. Fruit <orifice formed by curving of fruit or fruit segments>/
  - 1. with orifice formed by curving of fruit or fruit segments <1 or more in either coiled or straight fruit>/
  - 2. without orifice formed by curving of fruit or fruit segments/
- #23. Fruit <declination prior to dehiscence>/
  - 1. 0.5-coiled/

2. 1-coiled/
3. 1.5-coiled/
4. 2-coiled/
5. 3-coiled/
6. 4-coiled/
7. 5- to 10-coiled/
8. contorted/
9. curved <including slightly curved>/
10. S-curved/
11. straight/
- #24. Fruit <plicated>/
  1. plicate/
  2. not plicate/
- #25. Fruit <twist prior to dehiscence>/
  1. twisted/
  2. not twisted/
- #26. Fruit <outline in valvular view symmetry>/
  1. symmetrical/
  2. asymmetrical/
- #27. Fruit <shapes, both symmetrical or asymmetrical>/
  1. C-shaped <asymmetrical>/
  2. circular <symmetrical or asymmetrical>/
  3. coiled <asymmetrical>/
  4. didymous <symmetrical>/
  5. dolabriform <asymmetrical>/
  6. elliptic <symmetrical or asymmetrical>/
  7. falcate <asymmetrical>/
  8. fusiform <symmetrical or asymmetrical>/
  9. irregularly fusiform <asymmetrical>/
  10. harp-shaped <asymmetrical>/
  11. irregular <asymmetrical shapes not classified>/
  12. lanceolate <symmetrical or asymmetrical>/
  13. linear <symmetrical or asymmetrical>/
  14. moniliform <symmetrical or asymmetrical>/
  15. oblanceolate <symmetrical or asymmetrical>/
  16. obliquely oblanceolate <asymmetrical>/
  17. oblong <symmetrical or asymmetrical>/
  18. obovate <symmetrical or asymmetrical>/
  19. obliquely obovate <symmetrical or asymmetrical>/
  20. ovate <symmetrical or asymmetrical>/
  21. obliquely ovate <asymmetrical>/
  22. quadrangular <symmetrical or asymmetrical>/
  23. rectangular <asymmetrical>/
  24. reniform <asymmetrical>/
  25. rhombic <symmetrical or asymmetrical>/
  26. S-shaped <asymmetrical>/
  27. samaroid <asymmetrical>/
  28. triangular <symmetrical or asymmetrical>/
- #28. Fruit when asymmetrical with <asymmetrical with sutures parallel or not>/
  1. 1 straight and 1 curved suture/
  2. both sutures nearly straight/

- 3. both sutures parallelly curved/
- 4. both sutures unequally curved/
- #29. Fruit <asymmetrical shape for those with 1 straight suture>/
  - 1. widest near apex/
  - 2. widest near middle or D-shaped/
  - 3. widest at base/
  - 4. narrowing in several places, resembling Desmodium (9.09) fruit/
  - 5. narrowest near middle, B-shaped/
  - 6. narrowing slightly once or twice on one side/
- #30. Fruit <inflated or not>/
  - 1. inflated <turgid>/
  - 2. not inflated/
- #31. Fruit <in transection>/
  - 1. compressed/
  - 2. cruciform/
  - 3. flattened/
  - 4. mounded on 1 side and straight on other side/
  - 5. quadrangular/
  - 6. subtriangular/
  - 7. terete <including subterete>/
- #32. Fruit <apex with beak>/
  - 1. with beak/
  - 2. without beak/
- #33. Fruit <beak apex>/
  - 1. straight/
  - 2. declined/
  - 3. hooked/
  - 4. coiled/
- #34. Fruit with <beak description>/
  - 1. papery fragile beak up to 1 cm long/
  - 2. white-bristle beak up to 3 mm long/
  - 3. solid beak the same color and texture as fruit/
- #35. Fruit <shape at apex>/
  - 1. abruptly long acuminate at apex/
  - 2. blunt at apex/
  - 3. cordate at apex/
  - 4. emarginate at apex/
  - 5. rounded at apex/
  - 6. long tapered at apex <gradually attenuate>/
  - 7. tapered at apex <attenuate>/
  - 8. short tapered at apex <abruptly attenuate>/
  - 9. truncate at apex/
- #36. Fruit apex <apex alignment>/
  - 1. aligned with longitudinal axis of fruit/
  - 2. oblique with longitudinal axis of fruit/
  - 3. right-angled with longitudinal axis of fruit/
  - 4. almost reaching longitudinal axis of fruit/
  - 5. exceeding (crossing) longitudinal axis of fruit/
- #37. Fruit <shape at base>/
  - 1. cordate at base/
  - 2. emarginate at base/

- 3. rounded at base/
- 4. long tapered at base <gradually attenuate>/
- 5. tapered at base <attenuate>/
- 6. short tapered at base <abruptly attenuate>/
- 7. truncate at base/
- #38. Fruit base <base alignment>/
  - 1. aligned with longitudinal axis of fruit/
  - 2. oblique with longitudinal axis of fruit/
  - 3. right angled with longitudinal axis of fruit/
- #39. Fruit with the apex and base <texture uniformity>/
  - 1. uniform in texture/
  - 2. differing in texture/
- #40. Fruit <textures with the apex and base differing in texture>/
  - 1. upper 1/2 hardened (coriaceous, leathery, or cartilaginous) and lower 1/2 membranous/
  - 2. upper 1/2 inflated and reticulate over seed cavity and lower 1/2 adnate and wrinkled to scurfy over seed cavity/
  - 3. upper 3/4 barely inflated, reticulate, and pubescent and lower 1/4 not inflated, reticulate, or pubescent/
  - 4. upper 1/4-2/3 firm and/or pubescent and lower 3/4-1/3 fragile and glabrous/
- #41. Fruit <texture>/
  - 1. chartaceous/
  - 2. coriaceous <including subcoriaceous>/
  - 3. drupaceous/
  - 4. fleshy <including subfleshy>/
  - 5. fragile, thinner than chartaceous, like Trifolium/
  - 6. leathery/
  - 7. ligneous <including subligneous>/
  - 8. membranous/
- #42. Fruit seed chambers externally <seed chamber externally visibility>/
  - 1. visible/
  - 2. invisible/
- #43. Fruit with the raised seed chambers <shape of raised seed chambers>/
  - 1. torulose/
  - 2. not torulose/
- #44. Fruit margin <constricted or not constricted>/
  - 1. constricted/
  - 2. not constricted/
- #45. Fruit margin <location of marginal constrictions>/
  - 1. constricted along both margins/
  - 2. slightly constricted along both margins/
  - 3. constricted only on 1 margin/
  - 4. slightly constricted only on 1 margin/
  - 5. constricted on 1 margin and slightly constricted on the other margin/
- #46. Fruit margin <sulcate or not sulcate>/
  - 1. with sulcus/
  - 2. without sulcus/
- #47. Fruit margin <plain or not>/
  - 1. embellished/
  - 2. plain/
- #48. Fruit margin with <embellishment>/

1. flange(s)/
  2. fringe/
  3. prickles/
  4. ridge(s)/
  5. spines/
  6. thickened sutural areas/
  7. wing(s)/
- #49. Fruit wing(s) <occurrence of wings on epicarp>/
1. present/
  2. absent/
- #50. Fruit wing(s) <number>/
- #51. Fruit wing(s) <width>/
- mm wide/
- #52. Fruit wing(s) <location>/
1. samaroid/
  2. valvular <on face of valve>/
  3. sutural <on suture>/
  4. continuous wing around fruit/
- #53. Fruit wing(s) <position of wing, basal or apical>/
1. apical <seed and style at opposite ends>/
  2. basal <seed and style at same end>/
- #54. Fruit wing(s) on <position of valvular wing(s)>/
1. 1 valve/
  2. both valves/
- #55. Fruit wing(s) on <position of sutural wing(s)>/
1. 1 suture/
  2. both sutures/
- #56. Fruit <presence of stipe>/
1. stipitate <5 mm or more long>/
  2. substipitate <0.1-5 mm long>/
  3. nonstipitate <sessile>/
- #57. Fruit with the stipe <length of fruit stipe>/
- mm long/

#### FRUIT DEHISCENCE

- #58. Fruit <dehiscence>/
1. with all layers dehiscing <opening regularly>/
  2. with epicarp and mesocarp dehiscing and endocarp not dehiscing/
  3. with epicarp and mesocarp breaking near center of valve and endocarp dehiscing along suture/
  4. indehiscent/
- #59. Fruit <type of dehiscence>/
1. splitting along suture(s)/
  2. separating from suture(s) and along loment segment margins/
  3. fenestrating, opening by a coiling strip of tissue/
  4. opening by deterioration of delicate strip of tissue along inner suture or both sutures/
  5. with epicarp and mesocarp splitting along suture, endocarp lomented, forming an envelope around each seed, with a flat winglike part/
  6. with epicarp and mesocarp splitting along suture, endocarp entire, forming an envelope around the seeds with flat winglike areas/

- #60. Dehiscence of valves along <on 1 or both sutures>/
  - 1. 1 suture/
  - 2. both sutures/
- #61. Dehiscence of valves <origin and direction>/
  - 1. apical and down/
  - 2. medial and up and down/
  - 3. basal and up/
- #62. Dehiscence of valves <active or passive>/
  - 1. active/
  - 2. passive/
- #63. Dehiscence of valves with valves <of active dehiscent fruits>/
  - 1. breaking/
  - 2. coiling/
  - 3. enrolling/
  - 4. reflexing/
  - 5. revolute/
  - 6. twisting/
- #64. Replum <result of deciduous valves>/
  - 1. visible <valves deciduous>/
  - 2. invisible <valves not deciduous>/
- #65. Loment <ligneous segment entire or partial>/
  - 1. an intact article <with epicarp>/
  - 2. a partial article <without epicarp>/
- #66. Loment <dehiscence>/
  - 1. dehiscing along 1 suture/
  - 2. dehiscing along both sutures/
  - 3. indehiscent/
- #67. Loment segments (articles) <cleavage surface>/
  - 1. conspicuous/
  - 2. inconspicuous/
- #68. Loment segments (articles) <length; loment segment width and thickness are recorded as fruit width and thickness>
  - /mm long/
- #69. Loment segments widest across <article width>/
  - 1. seed area/
  - 2. each end/
- #70. Loment segments with <relative shapes to each other>/
  - 1. all essentially similar in shape/
  - 2. upper 1 different shape than middle one(s)/
  - 3. lower 1 different shape than middle one(s)/
  - 4. upper 1 different shape than lower 1/
- #71. Loment segments <article shape in outline>/
  - 1. circular/
  - 2. curved/
  - 3. D-shaped/
  - 4. elliptic/
  - 5. hippocrepiform <horseshoe or ring-shaped>/
  - 6. linear/
  - 7. oblong/
  - 8. ovate/
  - 9. quadrangular/

- 10. rectangular/
- 11. trapezoid/
- 12. triangular/

EPICARP

- #72. Epicarp <sheen>/
  - 1. dull/
  - 2. glaucous/
  - 3. glossy/
  - 4. semiglossy/
- #73. Epicarp <mono- or multicolored>/
  - 1. monochrome/
  - 2. multicolored/
- #74. Epicarp <color pattern when multicolored>/
  - 1. bichrome/
  - 2. mottled/
  - 3. streaked/
- #75. Epicarp <monochrome color>/
  - 1. black/
  - 2. brown/
  - 3. gray/
  - 4. green/
  - 5. orange/
  - 6. pink/
  - 7. purple/
  - 8. red/
  - 9. tan/
  - 10. yellow/
- #76. Epicarp with <overlying color for mottled and streaked fruits>/
  - 1. black overlay/
  - 2. brown overlay/
  - 3. gray overlay/
  - 4. green overlay/
  - 5. orange overlay/
  - 6. pink overlay/
  - 7. purple overlay/
  - 8. red overlay/
  - 9. tan overlay/
  - 10. yellow overlay/
- #77. Epicarp mottling color combination <mottling patterns>/
  - 1. constant/
  - 2. variable/
- #78. Epicarp with <constant combinations of mottling patterns>/
  - 1. mottling over seed chambers/
  - 2. without mottling over seed chambers/
- #79. Epicarp with surface texture <texture>/
  - 1. uniform/
  - 2. not uniform, with patches of different texture not restricted to the base and apex/
- #80. Epicarp <glabrous to pubescent>/
  - 1. glabrous/



- 2. glabrate/
- 3. pubescent and indurate/
- 4. pubescent but soon deciduous/
- #81. Epicarp with hairs <hair elevation>/
  - 1. erect/
  - 2. appressed/
- #82. Epicarp with <pubescence uniformity>/
  - 1. 1 type of pubescence/
  - 2. 2 types of pubescence/
  - 3. 3 types of pubescence/
- #83. Epicarp <type of pubescence>/
  - 1. hirsute/
  - 2. peltate <densely micropuberulous>/
  - 3. pilose/
  - 4. puberulent/
  - 5. sericeous/
  - 6. strigose/
  - 7. tomentose/
  - 8. velutinous/
  - 9. villous/
- #84. Epicarp with pubescence <pubescence color>/
  - 1. black/
  - 2. brown/
  - 3. golden/
  - 4. gray <including silver>/
  - 5. gray-brown/
  - 6. red/
  - 7. tan/
  - 8. white/
  - 9. yellow/
- #85. Epicarp with <pubescence color variability>/
  - 1. longitudinal bands of lighter and darker brown/
  - 2. appressed dark brown hairs and scattered erect gray hairs intermixed/
  - 3. appressed dark brown hairs and scattered erect white hairs intermixed/
  - 4. long appressed brown hairs and short and shorter white hairs intermixed/
  - 5. golden glandular hairs and short-pilose reddish-brown intermixed/
  - 6. erect golden hairs and white hooked or not hooked hairs/
  - 7. golden hooked hairs and gray plain hairs/
  - 8. gray and black hairs intermixed/
  - 9. long and short gray plain-tipped hairs/
  - 10. gray hairs on valves and golden hairs on sutures/
  - 11. long and short white hairs intermixed/
  - 12. long and short yellow hairs intermixed/
  - 13. long and short golden to brown hairs intermixed/
  - 14. long white and short golden hairs intermixed/
  - 15. contiguous areas of golden and white hairs/
- #86. Epicarp <uniformity of pubescence distribution within patterns of pubescence>/
  - 1. with pubescence uniformly distributed/
  - 2. with apical pubescence different from basal pubescence/

- 3. denser near sutures, sparse centrally/
- #87. Epicarp with <variable pubescence pattern>/
  - 1. apical 1/4 tomentose and basal 3/4 glabrous/
  - 2. apical 3/4 tomentose and basal 1/4 glabrous/
  - 3. apical 1/2 crinkly tomentose and basal 1/2 densely villose with straight hairs/
  - 4. apical 1/3-1/2 pubescent and basal 1/2-2/3 glabrous/
  - 5. apical 3/4 glabrous and basal 1/4 pilose/
  - 6. stipe (only) sericeous <Styphnolobium, in literature>/
- #88. Epicarp with <type of hairs>/
  - 1. simple hairs/
  - 2. glandular hairs/
  - 3. oleaginous hairs/
  - 4. complex hairs/
- #89. Epicarp with <with complex hairs>/
  - 1. bristle-like hairs/
  - 2. plumose hairs/
  - 3. scales/
  - 4. setae/
  - 5. stellate hairs/
  - 6. T-shaped hairs/
- #90. Epicarp <pubescence flexibility>/
  - 1. stiff/
  - 2. pliable/
- #91. Epicarp with hair bases <shape of pubescence base>/
  - 1. swollen/
  - 2. plain/
- #92. Epicarp <hair orientation when bristle-like>/
  - 1. antrorse/
  - 2. retrorse/
  - 3. straight <not bent>/
- #93. Epicarp <apex shape of bristle-like hairs>/
  - 1. straight at apex/
  - 2. coiled at apex/
  - 3. curved at apex/
  - 4. hooked at apex/
- #94. Epicarp <surface>/
  - 1. glandular/
  - 2. eglandular/
- #95. Epicarp with glandular <gland structure>/
  - 1. disks/
  - 2. dots/
  - 3. hairs/
  - 4. papillae/
  - 5. setae/
- #96. Epicarp <gland distribution>/
  - 1. distributed over entire fruit/
  - 2. limited to a portion of fruit/
- #97. Epicarp <relative amount of fruit with glands>/
  - 1. upper 1/4-2/3 glandular and lower 3/4-1/3 eglandular/
  - 2. upper 1/2 glandular and lower 1/2 eglandular/

- 3. upper 2/3 glandular and lower 1/3 eglandular/
- 4. upper 3/4 glandular and lower 1/4 eglandular/
- #98. Epicarp <armature>/
  - 1. with spines <= prickles>/
  - 2. without spines/
- #99. Epicarp with spines <spine persistence>/
  - 1. persistent/
  - 2. broken off and their bases evident/
- #100. Epicarp with spines <spine coloration>/
  - 1. same color as the rest of the fruit/
  - 2. (or their basal remanent) a different color from the rest of the fruit/
- #101. Epicarp <topography>/
  - 1. smooth/
  - 2. not smooth/
- #102. Epicarp with <topography classes>/
  - 1. elevated features/
  - 2. recessed features/
- #103. Epicarp <venation \_ elevated feature>/
  - 1. veined/
  - 2. not veined/
- #104. Epicarp <type of venation>/
  - 1. longitudinally veined relative to fruit length/
  - 2. obliquely veined relative to fruit length/
  - 3. transversely veined relative to fruit length/
  - 4. reticulately veined <net-like>/
  - 5. irregularly veined/
- #105. Epicarp <tuberculate>/
  - 1. tuberculate/
  - 2. not tuberculate/
- #106. Epicarp with <position of tubercles>/
  - 1. spongy tubercles on each valve/
  - 2. solid tubercles on each valve/
- #107. Epicarp <topography for nonsmooth types with elevated features>/
  - 1. blistered/
  - 2. concentric whorls like a fingerprint/
  - 3. dotted/
  - 4. faveolate/
  - 5. glandular dotted <include resinous globular>/
  - 6. knobbed/
  - 7. lenticular/
  - 8. muricate/
  - 9. papillose/
  - 10. pusticulate/
  - 11. raised reticulate/
  - 12. ribbed/
  - 13. rugose/
  - 14. scaly/
  - 15. scurfy/
  - 16. shagreen/
  - 17. striate/

- 18. subvesicular/
- 19. tessellate/
- 20. tuberculate/
- 21. verrucose-rugose/
- 22. warty/
- 23. wrinkled/
- #108. Epicarp <topography for nonsmooth types with recessed features>/
  - 1. glandularly punctate/
  - 2. grooved/
  - 3. pitted/
  - 4. punctate/
  - 5. slitted obliquely/
- #109. Epicarp <exfoliation>/
  - 1. exfoliating/
  - 2. exfoliating in part/
  - 3. checking/
  - 4. not exfoliating/
- #110. Epicarp <cracked>/
  - 1. with cracks/
  - 2. without cracks/
- #111. Epicarp cracking <orientation of cracking pattern>/
  - 1. longitudinal to fruit length/
  - 2. oblique to fruit length/
  - 3. transverse to fruit length/
  - 4. irregular/

#### MESOCARP

- #112. Mesocarp <occurrence>/
  - 1. present/
  - 2. absent/
- #113. Mesocarp <thickness>/
  - 1. thick/
  - 2. thin/
  - 3. trace/
- #114. Mesocarp surface <venation when epicarp exfoliating>/
  - 1. uniformly veined/
  - 2. veined over seed chamber and inconspicuously veined on wing/
  - 3. not veined/
- #115. Mesocarp <number of layers; if solid then only 1-layered>/
  - 1. 1-layered/
  - 2. 2-layered/
  - 3. 3-layered/
- #116. Mesocarp <occurrence of balsamic vesicles>/
  - 1. with balsamic vesicles/
  - 2. without balsamic vesicles/
- #117. Mesocarp <occurrence of fibers>/
  - 1. with fibers/
  - 2. without fibers/
- #118. Mesocarp <presence of reniform canals>/
  - 1. with reniform canals/
  - 2. without reniform canals/

- #119. Mesocarp <texture in 1-layered types>/
1. firm-walled open empty cells/
  2. fibrous throughout <shreds>/
  3. fleshy <including pulpy>/
  4. glassy beads/
  5. mealy <soft>/
  6. spongy <soft>/
  7. vitreous <glasslike as in lava rock obsidium>/
  8. solid <of uniform texture but none of above>/
- #120. Mesocarp with fibers <fibrous types in 2-layers>/
1. over mealy tissue/
  2. over solid layer/
  3. over spongy tissue/
  4. over vitreous layer/
  5. embedded in mealy tissue over solid layer/
  6. below solid or compacted fibrous layer/
- #121. Mesocarp with <nonfibrous types in 2-layers>/
1. empty space (with or without spongy tissue) within solid layer/
  2. honeycomb layer over solid layer/
  3. solid layer over solid layer/
  4. solid layer over spongy layer/
  5. solid layer over vitreous layer/
  6. spongy layer over solid layer/
  7. veins over solid layer/
  8. vitreous layer over solid layer/
- #122. Mesocarp with <nonfibrous types in 3-layers>/
1. solid layer over spongy layer over solid layer/
  2. solid layer over 2 distinct spongy layers/
  3. solid layer over 2 distinct solid layers/
  4. solid layer over vitreous layer over solid layer/
  5. spongy layer over vitreous over solid layer/
  6. vitreous layer over 2 distinct solid layers/
- #123. Mesocarp <durability>/
1. chartaceous/
  2. coriaceous/
  3. fleshy/
  4. ligneous <including subligneous>/

#### ENDOCARP

- #124. Endocarp <occurrence>/
1. present/
  2. absent/
  3. concealed by adnate testa/
  4. concealed by fleshy mesocarp/
- #125. Endocarp <sheen>/
1. dull/
  2. glossy/
- #126. Endocarp <opaqueness>/
1. opaque/
  2. translucent/
- #127. Endocarp <color pattern>/

1. bichrome/
  2. monochrome/
  3. mottled/
  4. streaked/
- #128. Endocarp <monochrome color>/
1. black/
  2. brown/
  3. gray/
  4. green/
  5. purple/
  6. orange/
  7. red/
  8. tan/
  9. white/
  10. yellow/
- #129. Endocarp with <mottling patterns>/
1. mottling/
  2. mottling over seed chambers/
  3. mottling above and below seed chambers/
- #130. Endocarp with <streaking patterns>/
1. streaking/
  2. streaking over seed chambers/
  3. streaking above and below seed chambers/
- #131. Endocarp with <overlying color for mottling and streaking>/
1. black overlay/
  2. brown overlay/
  3. gray overlay/
  4. green overlay/
  5. pink overlay/
  6. purple overlay/
  7. red overlay/
  8. tan overlay/
  9. yellow overlay/
- #132. Endocarp <appearance on inner surface>/
1. cobwebby/
  2. cracked/
  3. fibrous/
  4. floury-filamentous/
  5. hairy/
  6. pithy/
  7. pulpy/
  8. reticulate/
  9. rugose/
  10. scurfy/
  11. smooth/
  12. spongy/
  13. veined/
  14. vitreous/
  15. transversely wrinkled/
- #133. Endocarp <adherence of pieces of testa to the endocarp>/
1. with adhering pieces of testa/

- 2. without adhering pieces of testa/
- #134. Endocarp with hairs <pubescence pattern>/
  - 1. restricted to sutures/
  - 2. in longitudinal rows/
  - 3. scattered over endocarp/
  - 4. surrounding seed chambers/
- #135. Endocarp <septation>/
  - 1. septate/
  - 2. subseptate/
  - 3. nonseptate/
- #136. Endocarp with septa <septa texture>/
  - 1. thin (tissue paper-like), flexible/
  - 2. thicker than paper, firm/
  - 3. composed of minute fringe of hairs/
- #137. Endocarp with septa <septa glandularity>/
  - 1. glandular/
  - 2. eglandular/
- #138. Endocarp <durability>/
  - 1. chartaceous/
  - 2. coriaceous/
  - 3. ligneous <including subligneous>/
  - 4. osseous/
  - 5. pulpy/
- #139. Endocarp <exfoliation>/
  - 1. exfoliating/
  - 2. exfoliating in part/
  - 3. not exfoliating/
- #140. Endocarp <fused to or separating from epicarp and mesocarp>/
  - 1. remaining fused to mesocarp and epicarp/
  - 2. separating from mesocarp/
  - 3. separating with mesocarp from epicarp/
- #141. Endocarp <fused to or separating from epicarp when mesocarp absent>/
  - 1. remaining fused to epicarp/
  - 2. separating from epicarp/
- #142. Endocarp <occurrence of wings>/
  - 1. without wings/
  - 2. with wing(s) extending into epicarp/
  - 3. with wing(s) not extending into epicarp/
- #143. Endocarp <entire or separating into 1-seeded winged segments>/
  - 1. entire/
  - 2. separating into 1-seeded winged segments/

#### SEEDS IN FRUIT

- #144. Seed(s) <number>/
- #145. Seed(s) length <alignment with fruit length>/
  - 1. parallel with fruit length/
  - 2. oblique to fruit length/
  - 3. transverse to fruit length/
- #146. Seed(s) <proximity with each other>/
  - 1. overlapping/
  - 2. touching/

- 3. neither overlapping nor touching/
- #147. Seed(s) in <arrangement in pod>/
  - 1. 1 series/
  - 2. 2 or more series/

#### FUNICULUS

- #148. Funiculus <whether very small>/
  - 1. <less than 0.5 mm long>/
  - 2. <0.5 mm long or more>/
- #149. Funiculus <length>/
  - mm long/
- #150. Funiculus of <lengths \_ 1, 2, or 3>/
  - 1. 1 length only/
  - 2. 2 different lengths/
- #151. Funiculus <thickness>/
  - 1. filiform/
  - 2. flattened/
  - 3. partially filiform and partially thick/
  - 4. thick/
  - 5. triangular/
- #152. Funiculus <outline>/
  - 1. anvil-shaped/
  - 2. coiled/
  - 3. contorted/
  - 4. convoluted/
  - 5. curved/
  - 6. S-curved/
  - 7. hooked/
  - 8. plicate/
  - 9. straight/
  - 10. triangular/

#### ARIL

- #153. Aril <occurrence>/
  - 1. present/
  - 2. absent/
- #154. Aril <texture>/
  - 1. fleshy/
  - 2. dry/
- #155. Aril when fleshy <if fleshy, shape>/
  - 1. annular/
  - 2. caplike/
  - 3. cupshaped/
  - 4. expanded funiculus/
  - 5. flat from apex to near base/
  - 6. hippocrepiform rim-aril/
  - 7. hooked/
  - 8. horseshoe shaped/
  - 9. irregular/
  - 10. knotty/
  - 11. leaflike and attached to marginal hilum/



- 12. 2-lipped rim-aril/
- 13. marginal around seed/
- 14. marginal hilar/
- 15. spherical with prominent apical depression/
- 16. topknotlike/
- #156. Aril <if fleshy, margin shape>/
  - 1. crenate/
  - 2. entire/
  - 3. fimbriate/
  - 4. laciniate/
- #157. Aril covering <if fleshy, amount of seed covered>/
  - 1. less than 1/2 of seed/
  - 2. 1/2 to nearly all of seed/
- #158. Aril when dry <if dry, shape>/
  - 1. caplike/
  - 2. cupshaped/
  - 3. hippocrepiform rim-aril/
  - 4. hooded/
  - 5. 2-lipped rim-aril/
  - 6. rim-aril/
  - 7. partial rim-aril/
  - 8. tongue-aril/
- #159. Aril <if dry, margin shape>/
  - 1. crenate/
  - 2. entire/
  - 3. fimbriate/
  - 4. laciniate/
- #160. Aril covering <if dry, amount of seed covered>/
  - 1. less than 1/2 of seed/
  - 2. 1/2 to nearly all of seed/
- #161. Aril <presence or absence of tongue(s) or flap(s) on lip(s) of 2-lipped rim-aril>/
  - 1. with tongues (or flap-like) on lips of 2-lipped rim-aril/
  - 2. without tongue (or flap-like) on lips of 2-lipped rim-aril/
- #162. Aril with <number of tongue(s) or flap(s) on lip(s) of 2-lipped rim-aril>/
  - 1. 1 tongue or flap on 1 lip of 2-lipped rim-aril/
  - 2. 2 tongues or flaps, 1 on each lip of 2-lipped rim-aril/
- #163. Aril <color>/
  - 1. black/
  - 2. brown/
  - 3. cream/
  - 4. gray/
  - 5. green/
  - 6. ivory/
  - 7. olive/
  - 8. orange/
  - 9. pink/
  - 10. red/
  - 11. tan/
  - 12. white/
  - 13. yellow/

## SEED CHARACTERS

- #164. Seed <recording of morphology>/
  - 1. internal and external morphology recorded/
  - 2. external morphology only recorded/
  - 3. internal morphology only recorded <<testa absent or damaged>>/
  - 4. morphology not scored/
- #165. Seed <length>/
  - mm long/
- #166. Seed <width>/
  - mm wide/
- #167. Seed <thickness>/
  - mm thick/
- #168. Seed <overgrown or not overgrown>/
  - 1. overgrown, 1 seed filling entire fruit cavity/
  - 2. not overgrown/
- #169. Seed <angular>/
  - 1. angular/
  - 2. not angular/
- #170. Seed <symmetrical or asymmetrical disregarding hilum>/
  - 1. symmetrical/
  - 2. asymmetrical/
- #171. Seed <shape in outline>/
  - 1. bilobed, cicerlike <bilobular to subglobular and beaked>/
  - 2. C-shaped/
  - 3. circular/
  - 4. cordate/
  - 5. D-shaped/
  - 6. elliptic/
  - 7. falcate/
  - 8. hippocrepiform/
  - 9. irregular/
  - 10. lanceolate/
  - 11. linear/
  - 12. mitaform <mitten shaped>/
  - 13. oblong/
  - 14. obovate/
  - 15. ovate/
  - 16. pyriform/
  - 17. quadrangular/
  - 18. rectangular/
  - 19. reniform/
  - 20. rhombic/
  - 21. samaroid/
  - 22. trapezoid/
  - 23. triangular <including cuneate>/
- #172. Seed <transection>/
  - 1. terete <1:1 ratio including subterete>/
  - 2. quadrangular <1:1 ratio>/
  - 3. compressed <more or less 2:1 ratio>/
  - 4. flattened <greater than 4:1 ratio>/
  - 5. mounded on 1 side and straight on other side/

- #173. Seed with surface <external characters reflecting cotyledon characters>/
  - 1. grooved/
  - 2. ridged/
  - 3. smooth/
  - 4. wrinkled/
- #174. Seed with grooves <orientation of grooves>/
  - 1. longitudinal/
  - 2. oblique/
  - 3. reticulate/
  - 4. transverse/
- #175. Seed <external visibility of radicle & cotyledon lobes>/
  - 1. with visible radicle and cotyledon lobes/
  - 2. without visible radicle and cotyledon lobes/
- #176. Seed <presence of external groove between radicle and cotyledon lobes>/
  - 1. with external groove between radicle and cotyledon lobes/
  - 2. without external groove between radicle and cotyledon lobes/
- #177. Seed with external groove between radicle and cotyledon lobes <color of external groove between radicle and cotyledon lobes>/
  - 1. same color as testa/
  - 2. lighter in color than testa/
- #178. Seed <presence and depth of hilar sinus>/
  - 1. with deep hilar sinus/
  - 2. with shallow hilar sinus/
  - 3. without hilar sinus/
- #179. Seed <occurrence of umbo on seed face>/
  - 1. with umbo on seed faces/
  - 2. without umbo on seed faces/
- #180. Seed with umbo on <presence of umbo on 1 or 2 faces>/
  - 1. 1 face of seed/
  - 2. both faces of seed/
- #181. Seed <face with medial ridge>/
  - 1. with medial ridge on each face <Coronilla varia>/
  - 2. without medial ridge on each face/

#### CUTICLE

- #182. Cuticle <exfoliation>/
  - 1. exfoliating/
  - 2. not exfoliating/
- #183. Cuticle <inflation>/
  - 1. inflated/
  - 2. not inflated/
- #184. Cuticle inflated around <position of inflation>/
  - 1. hilum/
  - 2. margin of seed/
- #185. Cuticle <wrinkling>/
  - 1. wrinkled/
  - 2. not wrinkled/

#### TESTA

- #186. Testa <occurrence on embryo>/
  - 1. present/
  - 2. absent <usually fused to endocarp, not discernible>/

- #187. Testa <adherence of pieces of epicarp>/
  - 1. with pieces of adhering epicarp/
  - 2. without pieces of adhering epicarp/
- #188. Testa <adherence to endocarp>/
  - 1. partially adhering to endocarp/
  - 2. not adhering to endocarp/
  - 3. completely adhering to endocarp/
- #189. Testa <fusion to endocarp>/
  - 1. free from endocarp/
  - 2. fused to endocarp, at most a transparent brown tissue/
- #190. Testa <sheen>/
  - 1. dull/
  - 2. glaucous/
  - 3. glossy/
  - 4. velvet/
- #191. Testa <color modified by a bloom>/
  - 1. not modified by a bloom/
  - 2. modified by a bloom/
- #192. Testa <pigmentation of testa>/
  - 1. colored/
  - 2. clear <color absent>/
- #193. Testa <color pattern>/
  - 1. bichrome <2 different colored areas>/
  - 2. monochrome/
  - 3. mottled/
  - 4. streaked/
- #194. Testa with <degree of mottling>/
  - 1. frequent mottles <more than 3 marks per face>/
  - 2. infrequent mottles <1-3 marks per face>/
- #195. Testa with <degree of streaking>/
  - 1. frequent streaks <more than 3 marks per face>/
  - 2. infrequent streaks <1-3 marks per face>/
- #196. Testa <color>/
  - 1. black/
  - 2. blue/
  - 3. brown/
  - 4. cream/
  - 5. gray/
  - 6. green/
  - 7. ivory/
  - 8. olive/
  - 9. orange/
  - 10. pink/
  - 11. purple/
  - 12. red/
  - 13. scarlet/
  - 14. tan/
  - 15. white/
  - 16. yellow/
- #197. Testa with <overlying color for mottling and streaking>/
  - 1. black overlay/

- 2. brown overlay/
- 3. gray overlay/
- 4. green overlay/
- 5. orange overlay/
- 6. pink overlay/
- 7. purple overlay/
- 8. red overlay/
- 9. tan overlay/
- 10. yellow overlay/
- #198. Testa <glabrous or pubescent>/
  - 1. glabrous/
  - 2. minutely pubescent/
- #199. Testa <smooth or ornamented>/
  - 1. smooth/
  - 2. not smooth/
- #200. Testa with <topography classes>/
  - 1. elevated features/
  - 2. recessed features/
- #201. Testa <topography for nonsmooth types with elevated features>/
  - 1. bearing endocarp remnants/
  - 2. bearing a raised line/
  - 3. blistered cuticle/
  - 4. corrugate/
  - 5. echinate/
  - 6. papillate/
  - 7. powdery and not rubbing off/
  - 8. pustulate/
  - 9. reticulate/
  - 10. with 1 longitudinal ridge on each face/
  - 11. ridged longitudinally more than once/
  - 12. transversely ridged/
  - 13. rugose/
  - 14. shagreen/
  - 15. tessaroid/
  - 16. tuberculate/
  - 17. veined/
  - 18. verrucose/
  - 19. warty/
  - 20. wrinkled/
- #202. Testa <topography for nonsmooth types with recessed features>/
  - 1. concaved/
  - 2. cracked/
  - 3. large depressions on each face/
  - 4. grooved/
  - 5. pitted with large concatenated pits/
  - 6. pitted with small separate pits/
  - 7. pitted with stomata in the bottom of the pits/
  - 8. punctate/
  - 9. striate/
- #203. Testa <thickness>/
  - 1. chartaceous/
  - 2. coriaceous <including subcoriaceous>/

- 3. osseous <including subosseous>/
- #204. Pleurogram <occurrence <do not use in faboid descriptions>>/
  - 1. present/
  - 2. absent/
- #205. Pleurogram <degree of occurrence as a percentage <do not use in faboid descriptions>>/
  - %/
- #206. Pseudopleurogram <occurrence <do not use in faboid descriptions>>/
  - 1. present/
  - 2. absent/
- #207. Pseudopleurogram <degree of occurrence as a percentage <do not use in faboid descriptions>>/
  - %/
- #208. Fracture lines <occurrence>/
  - 1. present/
  - 2. absent/
- #209. Fracture lines <type>/
  - 1. concentric/
  - 2. irregular/
  - 3. longitudinal/
  - 4. reticulate/
  - 5. transverse/
- #210. Rim <appearance>/
  - 1. present/
  - 2. absent/
- #211. Rim wing-like <type of wing-like rim>/
  - 1. at 1 end of seed/
  - 2. at both ends of seed/
  - 3. around seed/
  - 4. along 1 side of seed/
- #212. Wing(s) <occurrence>/
  - 1. present/
  - 2. absent/
- #213. Wing(s) <type>/
  - 1. at 1 end/
  - 2. at both ends/
  - 3. continuous around seed/

RAPHE

- #214. Raphe <visible or not>/
  - 1. visible/
  - 2. not visible/
- #215. Raphe from <position>/
  - 1. hilum through lens to base of seed and terminating/
  - 2. hilum through lens to base of seed and bifurcating/
  - 3. hilum to lens/
  - 4. hilum to near base of seed and terminating/
  - 5. hilum through lens and base of seed to point opposite hilum/
  - 6. hilum through lens and terminating before base of seed/
  - 7. hilum through base of seed and up the other side/
  - 8. lens to base of seed and terminating/

- 9. lens to base of seed and bifurcating/
- #216. Raphe <bifurcating>/
  - 1. bifurcating at base of seed with each arm going up antiraphe side turning (U-shaped) down and approaching bifurcation/
  - 2. not bifurcating/
- #217. Raphe <color contrasted to testa>/
  - 1. color of testa/
  - 2. lighter than testa/
  - 3. darker than testa/
- #218. Raphe <color different than testa>/
  - 1. black/
  - 2. brown/
  - 3. purple <reddish>/
  - 4. tan/
- #219. Raphe <elevation in relation to testa>/
  - 1. raised/
  - 2. flush/
  - 3. recessed/

#### HILUM

- #220. Hilum <occurrence>/
  - 1. present <may be concealed>/
  - 2. absent/
- #221. Hilum <concealment>/
  - 1. visible <exposed>/
  - 2. partially concealed/
  - 3. fully concealed/
- #222. Hilum concealed by <how concealed>/
  - 1. aril/
  - 2. aril remnant/
  - 3. funiculus/
  - 4. funicular remnant/
  - 5. fusion to endocarp/
  - 6. radicle lobe/
  - 7. wing/
- #223. Hilum <with faboid split>/
  - 1. with faboid split/
  - 2. without faboid split/
- #224. Hilum with the lips of the faboid split <relative color of lips of faboid split>/
  - 1. the same color as the rest of the hilum/
  - 2. lighter colored than the rest of the hilum and therefore conspicuous/
- #225. Hilum <punctiform or larger>/
  - 1. punctiform <less than 0.3 mm in diameter>/
  - 2. larger than punctiform/
- #226. Hilum <length or diameter>/
  - mm long/
- #227. Hilum with <larger than punctiform>/
  - 1. angular outline/
  - 2. curved outline/
  - 3. straight outline <linear>/
- #228. Hilum <curved outline>/

- 1. circular/
- 2. elliptic/
- 3. fusiform/
- 4. heart-shaped/
- 5. oval/
- #229. Hilum <angular outline>/
  - 1. irregular/
  - 2. triangular/
  - 3. V-shaped/
  - 4. wedge-shaped/
- #230. Hilum <straight outline>/
  - 1. oblong/
  - 2. linear/
- #231. Hilum <relative to radicle>/
  - 1. apical at apex of radicle tip <or nearly so>/
  - 2. subapical to radicle tip/
  - 3. apical according to radicle tip but marginal according to seed length/
  - 4. marginal according to radicle tip <or nearly so>/
  - 5. between cotyledon and radicle lobe/
- #232. Hilum <elevation>/
  - 1. raised/
  - 2. flush/
  - 3. recessed/
- #233. Hilum <within rim, corona, or halo>/
  - 1. within corona/
  - 2. within halo/
  - 3. within rim/
  - 4. not within corona, halo, or rim/
- #234. Hilum corona color <color>/
  - 1. of testa/
  - 2. lighter than testa/
  - 3. darker than testa/
- #235. Hilum halo color <color>/
  - 1. of testa/
  - 2. lighter than testa/
  - 3. darker than testa/
- #236. Hilum rim color <color>/
  - 1. of testa/
  - 2. lighter than testa/
  - 3. darker than testa/

#### LENS

- #237. Lens <visibility>/
  - 1. discernible/
  - 2. not discernible/
- #238. Lens <length>/
  - mm long/
- #239. Lens with margins <margin curvature>/
  - 1. straight/
  - 2. curved/
- #240. Lens <shapes with straight margins>/
  - 1. diamond-shaped/



- 2. irregular/
  - 3. linear/
  - 4. oblong/
  - 5. rectangular/
  - 6. rhombic/
  - 7. square/
  - 8. triangular/
  - 9. wedge-shaped/
- #241. Lens <shapes with curved margins>/
- 1. circular/
  - 2. elliptic/
  - 3. hourglass or dumbbell-shaped/
  - 4. irregular/
  - 5. key-hole shaped/
  - 6. 2 circular mounds separated by groove/
  - 7. 2 oblong mounds separated by groove/
  - 8. oblong/
  - 9. ovate/
  - 10. punctiform/
- #242. Lens <position relative to raphe>/
- 1. in groove of raphe/
  - 2. not in groove of raphe/
- #243. Lens <position relative to hilum>/
- 1. confluent with hilum <touching hilum or hilar rim>/
  - 2. adjacent to hilum <not touching hilum or hilar rim and less than 45 degrees from hilum>/
  - 3. 180 degrees from hilum/
  - 4. 270 degrees from hilum/
- #244. Lens <separation of lens from hilum in mm>  
/mm from hilum/
- #245. Lens <elevation>/
- 1. mounded/
  - 2. flush/
  - 3. recessed/
- #246. Lens <similarity of lens color to testa>/
- 1. same color as testa/
  - 2. similar color as testa/
  - 3. dissimilar color from testa/
- #247. Lens <contrast to testa having similar color>/
- 1. lighter than testa/
  - 2. darker than testa/
- #248. Lens <color>/
- 1. black/
  - 2. brown <including shades of brown>/
  - 3. gray/
  - 4. green/
  - 5. orange/
  - 6. purple <reddish>/
  - 7. red/
  - 8. tan/
  - 9. white/
  - 10. yellow/

- #249. Lens <within rim, corona, or halo>/  
1. within corona/  
2. within halo/  
3. within rim/  
4. not within corona, halo, or rim/

- #250. Lens corona color <color>/  
1. of testa/  
2. lighter than testa/  
3. darker than testa/

- #251. Lens halo color <color>/  
1. of testa/  
2. lighter than testa/  
3. darker than testa/

- #252. Lens rim color <color>/  
1. of testa/  
2. lighter than testa/  
3. darker than testa/

#### ENDOSPERM

- #253. Endosperm <occurrence>/  
1. present/  
2. absent/

- #254. Endosperm <thickness>/  
1. thick/  
2. thin/  
3. trace/

- #255. Endosperm <pluglike>/  
1. pluglike and resembling tip of radicle/  
2. not pluglike and not resembling tip of radicle/

- #256. Endosperm <degree covering embryo>/  
1. covering entire embryo/  
2. covering at least 1/2 of embryo, but not entire embryo/  
3. restricted to region of embryo/

- #257. Endosperm adnate to <adnation>/  
1. testa/  
2. embryo <encasing>/

#### COTYLEDONS

- #258. Cotyledons <smooth or not smooth>/  
1. smooth/  
2. not smooth/

- #259. Cotyledons <topography for nonsmooth types>/  
1. convoluted/  
2. dimpled once/  
3. dotted/  
4. glandular dotted (yellow latex-like substance inside)/  
5. 1-3 grooves on each face/  
6. 4-6 grooves on each face/  
7. 5-7-branched grooves (from veins of testa) on each face/  
8. with midrib/  
9. pitted/

- 10. glandular pitted/
- 11. glandular punctate/
- 12. rugose/
- 13. runcate/
- 14. sulcate/
- 15. veined/
- 16. wrinkled/
- #260. Cotyledons <outer face topography>/
  - 1. outer face of one cotyledon flat and other cotyledon convex/
  - 2. outer face of one cotyledon flat and other cotyledon concave/
  - 3. both outer faces convex/
  - 4. outer face of one cotyledon concave and other cotyledon convex/
  - 5. both outer faces flat/
  - 6. with 2 outer faces on each cotyledon, one flat and the other convex/
- #261. Cotyledons <relative thickness>/
  - 1. one thicker than the other/
  - 2. both the same thickness/
- #262. Cotyledons <relationship of length of 1 to other>/
  - 1. 1 longer than other/
  - 2. both more or less of equal length <<equal if not stated>>/
- #263. Cotyledons <folded or not folded>/
  - 1. with only 1 folded/
  - 2. with both folded/
  - 3. not folded/
- #264. Cotyledons <degree of folding>/
  - 1. sufficiently folded for inner face to touch itself/
  - 2. not sufficiently folded for inner face to touch itself/
- #265. Cotyledons portions of inner folded face <equality of folded ends>/
  - 1. equal/
  - 2. unequal/
- #266. Cotyledons margin <margin 180 degrees from base of radicle>/
  - 1. entire 180 degrees from base of radicle/
  - 2. not entire 180 degrees from base of radicle/
- #267. Cotyledons <not entire margin 180 degrees from base of radicle>/
  - 1. bearing flaps/
  - 2. notched/
  - 3. wavy/
- #268. Cotyledons <comparison of apices>/
  - 1. similar at apex/
  - 2. differing at apex (1 concealed by overarching radicle and other auriculate and concealing radicle)/
- #269. Cotyledons <apex>/
  - 1. completely concealing radicle/
  - 2. partially concealing radicle/
  - 3. not concealing radicle/
- #270. Cotyledons <apical margin entire, split, or lobate>/
  - 1. entire over radicle/
  - 2. notched at radicle/
  - 3. split over radicle/
  - 4. 1 cotyledon scooped out to accommodate plicate radicle and other cotyledon entire/

- #271. Cotyledons <split over radicle \_ occurrence of lobes>/
  - 1. with lobes/
  - 2. without lobes/
- #272. Cotyledons with lobes <condition of lobes>/
  - 1. overlapping/
  - 2. touching (auriculate)/
  - 3. not touching/
- #273. Cotyledons <formation of basal groin>/
  - 1. with basal groin formed by lobes/
  - 2. without basal groin formed by lobes/
- #274. Cotyledons with the interface division terminating <interface division termination>/
  - 1. at base of radicle/
  - 2. in radicle tissue/
- #275. Cotyledons <recession of margins>/
  - 1. with margin(s) recessed/
  - 2. without margins recessed/
- #276. Cotyledons with <recession of margins>/
  - 1. 1 margin recessed/
  - 2. both margins recessed <cotyledons dumb bell-shaped in transection>/
- #277. Cotyledons recessed on <relative position of a single recessed margin>/
  - 1. same side as hilum (terminal radicle)/
  - 2. same side as radicle/
  - 3. side opposite from radicle/
- #278. Cotyledons <color>/
  - 1. brown/
  - 2. green/
  - 3. orange/
  - 4. pink/
  - 5. red/
  - 6. tan/
  - 7. white/
  - 8. yellow/
- #279. Cotyledons inner face <inner face topography>/
  - 1. flat/
  - 2. concave/
  - 3. wavy/
  - 4. with central ridge on 1 and central groove on other/
  - 5. wrinkled/
  - 6. glandular dotted (with yellow latex-like substance inside)/
- #280. Cotyledons <pubescent or glabrous>/
  - 1. glabrous around base of radicle/
  - 2. pubescent around base of radicle/

#### EMBRYONIC AXIS

- #281. Embryonic axis <alignment of cotyledons and radicle>/
  - 1. deflexed <radicle-cotyledon axis deflexed>/
  - 2. oblique <radicle-cotyledon axis oblique>/
  - 3. parallel <radicle length parallel to cotyledon length>/
  - 4. right angled <radicle right angled to length of cotyledons>/
  - 5. S-curved <radicle-cotyledon axis S-curved>/
  - 6. straight <radicle-cotyledon axis aligned>/

- #282. Embryonic axis <angle in relationship to length of seed>/
  - 1. oblique to length of seed/
  - 2. parallel to length of seed/
  - 3. perpendicular to length of seed/
  - 4. plicate to length of seed/
- #283. Embryonic axis <jointed \_ with a structure similar to a pulvinus>/
  - 1. with a joint evident between the radicle and the cotyledons/
  - 2. without a joint evident between the radicle and the cotyledons/

#### RADICLE

- #284. Radicle <visibility>/
  - 1. differentiated from cotyledon/
  - 2. not differentiated from cotyledon/
- #285. Radicle <shape>/
  - 1. bulbous/
  - 2. linear/
  - 3. triangular/
  - 4. truncate/
- #286. Radicle lobe tip <shape>/
  - 1. straight/
  - 2. curved/
  - 3. hooked/
- #287. Radicle <internal relationship to cotyledons>/
  - 1. deflexed and parallel to cotyledon length/
  - 2. deflexed and parallel to cotyledon width/
  - 3. oblique to cotyledons/
  - 4. with 90 degree turn/
  - 5. with 180 degree turn/
  - 6. with 360 degree turn/
  - 7. straight with embryonic axis <like mimosoid & caesalpinoid>/
- #288. Radicle <centering of radicle and cotyledons>/
  - 1. centered between cotyledons/
  - 2. not centered between cotyledons (radicle outside 1 cotyledon and inside other, therefore junctions for each cotyledon different)/
- #289. Radicle <internal length when compared to cotyledon length>/
  - 1. less than 1/2 length of cotyledons/
  - 2. 1/2 to nearly length of cotyledons/
  - 3. equaling length of cotyledons/
  - 4. exceeding length of cotyledons/

#### PLUMULE

- #290. Plumule <development>/
  - 1. rudimentary/
  - 2. moderately developed/
  - 3. well developed/
- #291. Plumule <pubescent or glabrous>/
  - 1. glabrous/
  - 2. pubescent/

#### DISTRIBUTION

- #292. <Distribution>/
- #293. Distribution in world <native>/

1. New World/
  2. Old World/
  3. pantropical/
  4. pansubtropical/
  5. pan warm temperate/
- #294. Distribution in world <cultivated crop>/
1. worldwide crop/
  2. New World crop/
  3. Old World crop/
- #295. New World <distribution>/
1. Canada/
  2. United States <Continental \_ Hawaii included in Old World>/
  3. Mexico/
  4. West Indies/
  5. Central America/
  6. South America/
- #296. Old World <distribution>/
1. Europe/
  2. Mediterranean/
  3. Russia/
  4. Asia/
  5. China/
  6. Japan/
  7. Africa/
  8. Madagascar/
  9. Indian Ocean/
  10. India/
  11. Indochina/
  12. Indonesia/
  13. Australia/
  14. New Zealand/
  15. Pacific/
  16. New Guinea/
  17. Fiji/
  18. Hawaii/
  19. Korea/

#### NOTES

- #297. <Notes>/

#### LEGENDS

- #298. <Legend 1a-alphabetical list of taxa illustrated with plate letter(s)>/
- #299. <Legend 1b-morphological content of plate, alphabetical by plate letter>/
- #300. <Legend 2a-alphabetical list of taxa illustrated with plate letter(s)>/
- #301. <Legend 2b-morphological content of plate, alphabetical by plate letter>/
- #302. <Legend 3a-alphabetical list of taxa illustrated with plate letter(s)>/
- #303. <Legend 3b-morphological content of plate, alphabetical by plate letter>/

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