

Taxonomic significances of seed morphology in some tribes of subfamily Malvoideae (Malvaceae) in Saudi Arabia

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Appendix. List of characters and character states used in morphometric analysis of the subfamily Malvoideae in Saudi Arabia.

1. Seed size mm (Length X Width)

2. Seed shape

Cordate reniform

Rounded reniform

Ovate trigonous

Deltoid reniform

Broadly reniform

Ellipsoid reniform

D-Shape

3. Seed side

Flat

Concave

Convex

4. Seed symmetrically

Asymmetrical

Symmetrical

5. Seed apex

Acute

Obtuse

Truncate

6. Seed base

Reniform

Truncate

7. Seed color

Brown

Dark brown

Black

Reddish brown

Light brown

8. Indumentum

Hirtuse

Strigose

Glabrous

Densely woolly

Sparsely pubescent

Densely pilose

9. Hilum

Basal

Sub basal

Terminal

10. Surface pattern

Reticulate-foveate

Reticulate-foveate, verrucate

Foveate, verrucate

Reticulate, transversely scalariform

Foveate, tuberculate

Alveolate, rugose

Reticulate, rugose with silky trichomes

Reticulate, transversely rugose

Rugose, transversely scalariform

Irregularly rugose

Reticulate, verrucate

Reticulate, transversely striate

Reticulate - rugose, foveolate

Rugose, verrucate

11. Epidermal cell shape

Isodiametric
Isodiametric to angular
Elongated polygonal
Irregularly polygonal
Irregularly undulate
Elongated rectangular
Irregular isodiametric

12. Anticlinal boundaries

Raised, thick, ridged, rough
Raised, thick, striate, smooth
Raised, thin, undulate, smooth
Raised, thick, scabrate, rough
Raised, thin, smooth
Raised, thick, foveate to verrucate, rough
Raised, thick, rugose, rough
Raised, thin, foveate, rough
Raised, thin, ribbed, rough

13. Periclinal cell wall

Concave, verrucate, rough
Concave, verrucate to rugose, smooth
Concave, rugose, smooth
Concave, irregular pusticulate, smooth
Concave, verrucate to striate, rough
Concave, striate, smooth
Flat, rugose, rough
Flat, transversely ridged, rough
Flat, verrucate, rough
Flat, undifferentiated, smooth
Sunken