Table S3. Morphological trait information and GBIF ID for each species used in this study.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Species | GBIF ID | Plant.height(cm) | Leaflet.length(mm) | Sepal.length(mm) | Petal.length(mm) | Fruit.length(mm) | Stem.nature |
| *A.capensis* | *Augea capensis* | 50 | 40 | 15 | 15 | 40 | 0 |
| *F.acerosa* | *Fagonia acerosa* | 40 | 13 | 6 | 11 | 5.8 | 1 |
| *F.arabica* | *Fagonia arabica* | 50 | 12 | 3.5 | 6 | 7 | 1 |
| *F.bruguieri* | *Fagonia bruguieri* | 10 | 8 | 3 | 5 | 4.5 | 1 |
| *F.cretica* | *Fagonia cretica* | 30 | 24 | 4 | 12 | 9 | 0 |
| *F.glutinosa* | *Fagonia glutinosa* | 10 | 13 | 7 | 7.4 | 5.8 | 0 |
| *F.gypsophila* | *Fagonia gypsophila* | 40 | 30 | 3 | 6.5 | 4.5 | 1 |
| *F.harpago* | *Fagonia harpago* | 60 | 14 | 6 | 15 | 9 | 1 |
| *F.indica* | *Fagonia indica* | 50 | 30 | 3.5 | 6.5 | 6 | 1 |
| *F.laevis* | *Fagonia laevis* | 30 | 9 | 2.5 | 6.2 | 6 | 1 |
| *F.lahovarii* | *Fagonia lahovarii* | 30 | 17 | 4 | 7.5 | 6 | 1 |
| *F.latifolia* | *Fagonia latifolia* | 10 | 20 | 3.5 | 7 | 6 | 1 |
| *F.latistipulata* | *Fagonia latistipulata* | 30 | 18 | 7 | 7.5 | 4.5 | 1 |
| *F.longispina* | *Fagonia longispina* | 50 | 22 | 4 | 7 | 7 | 1 |
| *F.luntii* | *Fagonia luntii* | 30 | 25 | 4 | 7.5 | 6.5 | 1 |
| *F.minutistipula* | *Fagonia minutistipula* | 80 | 21 | 3 | 8 | 6.5 | 1 |
| *F.mollis* | *Fagonia mollis* | 40 | 17 | 5.5 | 14 | 7.5 | 1 |
| *F.olivieri* | *Fagonia olivieri* | 35 | 20 | 4 | 6 | 6 | 1 |
| *F.orientalis* | *Fagonia orientalis* | 35 | 20 | 3 | 9.5 | 6 | 0 |
| *F.pachyacantha* | *Fagonia pachyacantha* | 10 | 18 | 3.8 | 7.7 | 5.5 | 1 |
| *F.paulayana* | *Fagonia paulayana* | 40 | 31 | 3.7 | 6 | 5 | 1 |
| *F.rangei* | *Fagonia rangei* | 60 | 25 | 5.5 | 10 | 7 | 1 |
| *F.scabra* | *Fagonia scabra* | 30 | 16 | 4 | 6 | 6.5 | 1 |
| *F.subinermis* | *Fagonia subinermis* | 35 | 16 | 3 | 6 | 4 | 1 |
| *F.zilloides* | *Fagonia zilloides* | 50 | 12 | 4.5 | 9 | 6 | 1 |
| *Z.hildebrandtii* | *Melocarpum hildebrandtii* | 150 | 14 | 5 | 14 | 10 | 1 |
| *Z.robecchii* | *Melocarpum robecchii* | 150 | 20 | 6 | 18 | 8 | 1 |
| *Z.apiculata* | *Roepera apiculata* | 40 | 40 | 6 | 15 | 10 | 0 |
| *Z.billardierei* | *Roepera billardieri* | 10 | 15 | 5 | 10 | 12 | 0 |
| *Z.compressa* | *Roepera compressa* | 50 | 15 | 3 | 6 | 10 | 0 |
| *Z.cordifolium* | *Roepera cordifolia* | 60 | 25 | 6 | 18 | 16 | 1 |
| *Z.debile* | *Roepera debilis* | 150 | 25 | 5 | 15 | 17 | 1 |
| *Z.divaricatum* | *Roepera divaricata* | 30 | 7 | 3 | 10 | 10 | 1 |
| *Z.eremaea* | *Roepera eremaea* | 200 | 35 | 4 | 5 | 13 | 1 |
| *Z.flexuosum* | *Roepera flexuosa* | 120 | 12 | 4 | 12 | 8 | 1 |
| *Z.fruticulosum* | *Roepera fruticulosa* | 120 | 15 | 7.5 | 11 | 20 | 1 |
| *Z.glaucum* | *Roepera glauca* | 30 | 40 | 7 | 15 | 18 | 0 |
| *Z.incrustatum* | *Roepera incrustata* | 100 | 6 | 4 | 9 | 10 | 1 |
| *Z.iodocarpum* | *Roepera iodocarpa* | 16 | 20 | 4 | 4 | 7 | 0 |
| *Z.leptopetalum* | *Roepera leptopetala* | 20 | 20 | 2 | 8 | 6 | 1 |
| *Z.lichtensteinianum* | *Roepera lichtensteiniana* | 80 | 14 | 3 | 9 | 5 | 1 |
| *Z.maculatum* | *Roepera maculata* | 80 | 12 | 4 | 10 | 10 | 1 |
| *Z.maritimum* | *Roepera maritima* | 30 | 24 | 4 | 12 | 12 | 0 |
| *Z.morgsana* | *Roepera morgsana* | 120 | 62 | 4 | 12 | 37 | 1 |
| *Z.ovatum* | *Roepera ovata* | 15 | 10 | 1.5 | 1.5 | 8 | 0 |
| *Z.pygmaeum* | *Roepera pygmaea* | 30 | 8 | 4 | 12 | 8 | 1 |
| *Z.rogersii* | *Roepera rogersii* | 60 | 7 | 6 | 10 | 10 | 1 |
| *Z.spinosum* | *Roepera spinosa* | 60 | 20 | 4 | 12 | 10 | 1 |
| *Z.album* | *Tetraena alba* | 50 | 10 | 6 | 7 | 10 | 1 |
| *Z.chrysopteron* | *Tetraena chrysopteros* | 150 | 4 | 3 | 4 | 5 | 1 |
| *Z.clavatum* | *Tetraena clavata* | 20 | 7 | 3.5 | 4 | 12 | 1 |
| *Z.coccineum* | *Tetraena coccinea* | 30 | 6 | 4 | 4 | 10 | 1 |
| *Z.cylindrifolium* | *Tetraena cylindrifolia* | 90 | 10 | 3 | 4 | 9 | 1 |
| *Z.decumbens* | *Tetraena decumbens* | 60 | 15 | 2 | 4 | 10 | 1 |
| *Z.hamiense* | *Tetraena hamiensis* | 80 | 9 | 5 | 6 | 20 | 1 |
| *Z.madagascariensis* | *Tetraena madagascariensis* | 200 | 9 | 3 | 1 | 4 | 1 |
| *Z.migiurtinorum* | *Tetraena migiurtinorum* | 50 | 12 | 2 | 3 | 6 | 1 |
| *T.mongolica* | *Tetraena mongolica* | 80 | 7 | 2.5 | 3 | 6 | 1 |
| *Z.prismatocarpum* | *Tetraena prismatocarpa* | 100 | 16 | 3 | 6 | 10 | 1 |
| *Z.pterocaule* | *Tetraena pterocaulis* | 15 | 30 | 5.5 | 9.5 | 9 | 1 |
| *Z.simplex* | *Tetraena simplex* | 10 | 15 | 2 | 3 | 2.5 | 0 |
| *Z.atriplicoides* | *Zygophyllum atriplicoides* | 120 | 30 | 6 | 12 | 20 | 1 |
| *Z.brachypterum* | *Zygophyllum brachypterum* | 25 | 25 | 9 | 5 | 16 | 0 |
| *Z.fabago* | *Zygophyllum fabago* | 80 | 33 | 8 | 8 | 35 | 0 |
| *Z.gobicum* | *Zygophyllum gobicum* | 10 | 20 | 6 | 5 | 14 | 0 |
| *Z.gontscharovii* | *Zygophyllum gontscharovii* | 100 | 23 | 6 | 8 | 25 | 1 |
| *Z.lehmannianum* | *Zygophyllum lehmannianum* | 18 | 30 | 5 | 4 | 18 | 0 |
| *Z.macropterum* | *Zygophyllum macropterum* | 25 | 12 | 6 | 9 | 45 | 0 |
| *Z.microcarpum* | *Zygophyllum microcarpum* | 152 | 8 | 4 | 8 | 8 | 1 |
| *Z.miniatum* | *Zygophyllum miniatum* | 40 | 20 | 5 | 7 | 38 | 0 |
| *Z.obliquum* | *Zygophyllum obliquum* | 80 | 20 | 8 | 10 | 30 | 0 |
| *Z.oxycarpum* | *Zygophyllum oxycarpum* | 15 | 20 | 5 | 5 | 30 | 0 |
| *Z.potaninii* | *Zygophyllum potaninii* | 25 | 25 | 11 | 10 | 25 | 0 |
| *Z.pterocarpum* | *Zygophyllum pterocarpum* | 20 | 15 | 7 | 8 | 20 | 0 |
| *Z.xanthoxylum* | *Zygophyllum xanthoxylum* | 100 | 24 | 7 | 11 | 40 | 1 |