Table S1. Studies on *Astragalus* in which the germination data did not meet the requirements for inclusion in our meta-analysis, but they indicated that seeds of *Astragalus* have (or seem to have) physical dormancy or combinational dormancy (*A. amphioxys* and *A. cottonii*).

|  |  |  |
| --- | --- | --- |
| *Astragalus* species | Section | Reference |
| *A. accidens* | *Pruniformes* (Jones) Barneby | Spellenberg (1976) |
| *A. allochrous* | *Inflati* Gray | Head (1957) |
| *A. alopecuroides* | *Alopecuroidei* DC. | Merlo and Alemán (1996); Kožuharova *et al*. (2010) |
| *A. alpinus* | *Komaroviella* Gontsch. | Flüeler (1992) |
| *A. amphioxys* | *Argophylli* Gray | Spellenberg (1976) |
| *A. andersonii* | *Hamosi* Jones | Head (1957); Spellenberg (1976) |
| *A. aquilanus* | *Dissitiflori* DC. | Di Martino *et al*. (2015) |
| *A. arequipensis* | *-*a | Ledingham and Pepper (1973) |
| *A. arnottianus* | *-*a | Ledingham and Pepper (1973) |
| *A. arrectus* | *Reventi-Arrecti* Jones | Head (1957) |
| *A. arthurii* | *Hamosi* Jones | Head (1957) |
| *A. anxius* | *Micromerii* Barneby | Meinke and Kaye (1992) |
| *A. beckwithii* | *Inflati* Gray | Head (1957) |
| *A. bellus* | *-*a | Ledingham and Pepper (1973) |
| *A. bergii* | *-*a | Ledingham and Pepper (1973) |
| *A. brevidens* | *Uliginosi* Gray | Zarekia *et al*. (2014) |
| *A. brauntonii* | *Brauntoniani* Barneby | Fotheringham and Keeley (1998); [https://calscape.org/Astragalus-brauntonii-(Brauton’s-Milkvetch)?srchcr=sc57729a6625ca9](https://calscape.org/Astragalus-brauntonii-(Brauton's-Milkvetch)?srchcr=sc57729a6625ca9), accessed 4 January 2019) |
| *A. burkartii* | *-*a | Ledingham and Pepper (1973) |
| *A. campylotrichus* | *Heterodontus* Bunge | Rosbakh et al. (2020) |
| *A. canadensis* | *Uliginosi* Gray | Green and Curtis (1950); Head (1957); Hung and Xie (2008); Townsend and McGinnies (1972b); Sorensen and Holden (1974) |
| *A. caraganae* | *Astragalus* L. | Moghadam *et al*. (2012) |
| *A. cariensis* | *Incani* DC. | Erisen *et al*. (2011) |
| *A. carinatus* | *-*a | Ledingham and Pepper (1973) |
| *A. cemerinus* | *Microphysa* Bunge | Riahi and Zarre (2009) |
| *A. chamaeleuce* | *Argophylli* Gray | Head (1957) |
| *A. cibarius* | *Argophylli* Gray | Head (1957) |
| *A. clerceanus* | *Craccina* Bunge | Rosbakh et al. (2020) |
| *A. collinus* | *Collini* Jones | Head (1957) |
| *A. congdonii* | *Hamosi* Jones | Head (1957) |
| *A. conjunctus* | *Reventi-Arrecti* Jones | Head (1957) |
| *A. cottonii* | *Hemiphragmium* (Koch) Bunge | Kaye (1997) |
| *A. crotalariae* | *Preussiani* (Jones)Barneby | Spellenberg (1976) |
| *A. cruckshanksii* | *-*a | Ledingham and Pepper (1973) |
| *A. crypticus* | *-*a | Ledingham and Pepper (1973) |
| *A. cryptobotrys* | *-*a | Ledingham and Pepper (1973) |
| *A. curvicaulis* | *-*a | Ledingham and Pepper (1973) |
| *A. cusickii* | *Inflati* Gray | Head (1957) |
| *A. danicus* | *Hypoglottidei* DC. | Rosbakh et al. (2020) |
| *A darumbium* | *-*a | Ledingham and Pepper (1973) |
| *A. dasyanthus* | *Caprini* DC. | Kožuharova *et al*. (2010) |
| *A. demavendicus* | *Incani* DC. | Riahi *et al*. (2003) |
| *A. desereticus* | *Argophylii* Gray | Hotze (2011) |
| *A. devesae* | *Platyglottis* Bunge | Ribeiro *et al.* (2019) |
| *A. diaphanous* | Undetermind | Head (1957) |
| *A. diphacus* | *Diphaci* (Rydb.) Barneby | Spellenberg (1976) |
| *A. distinens* | *-*a | Ledingham and Pepper (1973) |
| *A. douglasii* | *Inflati* Gray | Spellenberg (1976) |
| *A. edmondstonei* | *-*a | Ledingham and Pepper (1973) |
| *A. effusus* | *Onobrychoidei* DC. | Zarekia *et al*. (2014) |
| *A. eremeticus* | *Reventi-Arrecti* Jones | Head (1957) |
| *A. ervoides* | *Miselli* Barneby | Spellenberg (1976) |
| *A. falcatus* | *Uliginosi* Gray | Townsend and McGinnies (1972a, b) |
| *A. flexuosus* | *Scytocarpi* Gray | Spellenberg (1976) |
| *A. frigidus* | *Phaca* Bunge | Flüeler (1992); Rosbakh et al. (2020) |
| *A. galegiformis* | *Galegiformes* Gray | Townsend and McGinnies (1972a, b) |
| *A. garbancillo* | *-*a | Ledingham and Pepper (1973) |
| *A. geminiflorus* | *-*a | Ledingham and Pepper (1973) |
| *A. giganteus* | *Gigantei* Barneby | Spellenberg (1976) |
| *A. glycophyllos* | *Glycyphyllos* (Stev.) Bunge | Rosbakh *et al*. 2020) |
| *A. granatensis*b | *Hypoglottidei* DC. | Trillo and Matilla (1993a,b); Lorite *et al.* (2007) |
| *A. gypsodes* | *Sarcocarpi* Gray | Head (1957) |
| *A. humistratus* | *Humistrati* (Jones) Barneby | Spellenberg (1976) |
| *A. hypsogenus* | *-*a | Ledingham and Pepper (1973) |
| *A. inflexus* | *Argophylli* Gray | Head (1957) |
| *A. jaegerianus* | *Jaegeriani* Barneby | Rundel *et al*. (2012) |
| *A. joergensenii* | *-*a | Ledingham and Pepper (1973) |
| *A. karelinianus* | *Dissitiflori* DC. | Rosbakh *et al*. (2020) |
| *A. laguroides* | *Laguropsis* Bunge | Rosbakh *et al*. (2020) |
| *A. latifolius* | *Incani* DC. | Riahi *et al*. (2003) |
| *A. lentiginosus* | *Inflati* Gray | Head (1957); Pavlik and Barbour (1988); Glenn (2009); Sankary and Barbour (1980); Ziemkiewicz and Cronin (1981) |
| *A. limariensis* | *-*a | Ledingham and Pepper (1973) |
| *A. lonchocarpus* | *Lonchocarpi* Gray | Karron (1989) |
| *A. longidentatus* | *Harpilobus* Bunge | Merlo and Alemán (1996) |
| *A. melanostachys* | *Brachycarpus* Boriss. | Ashraf and Gohil (1988) |
| *A. membranaceus*c | *Cenantrum* Koch | Duan *et al*. (2005); Shi *et al*. (2014) |
| *A. micranthellus* | *-*a | Ledingham and Pepper (1973) |
| *A. minimus* | *-*a | Ledingham and Pepper (1973) |
| *A. molissimus* | *Mollissimi* Gray | Head (1957); Spellenberg (1976); Melgoza-Castillo (1995); Castillo *et al*. (2003) |
| *A. neglectus* | *Neglecti* (Rydb.) Barneby | Bowles *et al*. (1993) |
| *A. nezaketae* | *Incani* DC. | Erisen *et al*. (2010) |
| *A. nutans* | *Inflati* Gray | Spellenberg (1976) |
| *A. onobrychis* | *Onobrychoidei* DC. | Rosbakh *et al*. (2020) |
| *A. oocalycis* | *Oocalyces* Barneby | Spellenberg (1976) |
| *A. orbiculatus* | *Myobroma* (Stev.) Bunge | Rosbakh *et al*. (2020) |
| *A. osterhoutii* | *Pectinati* Gray | Karron (1989) |
| *A. oxyphysus* | *Densifloii* (Rydb.) Barneby | Spellenberg (1976) |
| *A. pachypus* | *Podo-Sclerocarpi* Gray | Head (1957) |
| *A.* *paposanus* | *-*a | Ledingham and Pepper (1973) |
| *A. parodii* | *-*a | Ledingham and Pepper (1973) |
| *A. pattersonii* | *Preussiani* James | Spellenberg (1976) |
| *A. pehuenches* | *-*a | Ledingham and Pepper (1973) |
| *A. purshii* | *Argophylli* Gray | Head (1957) |
| *A. quinqueflorus* | *Quinqueflori* Barneby | Spellenberg (1976) |
| *A. racemosus* | *Bisulcati* Gray | Greene (1969) |
| *A. radicans* | *Strigulosi* Jones | Spellengerg (1976) |
| *A. remotijugus* | *Caprini* DC. | Farhangisabet *et al*. (2014) |
| *A. riparius* | *Reventi-Arrecti* Jones | Head (1957) |
| *A. rytilobus* | *Onycholobium* Pomel | Rosbakh *et al*. (2020) |
| *A. sabulonum* | *Inflati* Gray | Spellenberg (1976) |
| *A. schizopterus* | *Proselius* (Stev.) Bunge | Yorgancilar and Erisen (2011) |
| *A. schmolliae*d | *Lonchocarpi* Gray | Anderson (2004) |
| *A. sclerocarpus* | *Podo-Sclerocarpi* Gray | Head (1957) |
| *A. scopulorum* | *Tiopsidei* Barneby | Spellenberg (1976) |
| *A. serenoi* | *Nudi* Barneby | Spellenberg (1976) |
| *A. sheldonii* | *Reventi-Arrecti* Jones | Head (1957) |
| *A. sieberi* | *Astragalus* L. | Hammouda and Bakr (1969) |
| *A. siliceous* | *Humillimi* (Jones) Barneby | Spellenberg (1976) |
| *A. spaldingii* | *Chaetodontes* Gray | Head (1957) |
| *A. subsecundus* | *Laguropsis* Bunge | Zarekia *et al*. (2014) |
| *A. succumbens* | *Malaci* Barneby | Head (1957) |
| *A. sulcatus* | *Megacarpi* (Rydb.) Barneby | Rosbakh *et al*. (2020) |
| *A. tarijensis* | *-*a | Ledingham and Pepper (1973) |
| *A. tegetarioides* | *Humistrati* (Jones) Barneby | Meinke and Kaye (1992) |
| *A. tephrodes* | *Argophylli* Gray | Spellenberg (1976) |
| *A. tibetanus* | *Glycyrrhizi* Koch | Rosbakh *et al*. (2020) |
| *A. varius* | *Dissitiflori* DC. | Rosbakh *et al*. (2020) |
| *A. vegetus* | *Onobrychoidei* DC. | Zarekia *et al*. (2014) |
| *A. vesiculosus* | *-*a | Ledingham and Pepper (1973) |

aSouth American species not assigned to sections

bsyn*. A. glaux*

c syn*. A. propingquus*

d syn *A.* *platycarpus*

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