Dichotomous keys to the species of Solanum L. (Solanaceae) in continental Africa, Madagascar (incl. the Indian Ocean islands), Macaronesia and the Cape Verde Islands

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Abstract

Solanum L. (Solanaceae) is one of the largest genera of angiosperms and presents difficulties in identification due to lack of regional keys to all groups. Here we provide keys to all 135 species of Solanum native and naturalised in Africa (as defined by World Geographical Scheme for Recording Plant Distributions): continental Africa, Madagascar (incl. the Indian Ocean islands of Mauritius, La Réunion, the Comoros and the Seychelles), Macaronesia and the Cape Verde Islands. Some of these have previously been published in the context of monographic works, but here we include all taxa. The paper is designed to be used in conjunction with the web resource Solanaceae Source (www.solanaceaesource.org) and hyperlinks provide access to online descriptions, synonymy and images (where available) of each species. All taxa treated and specimens seen are included in searchable Suppl. material 1, 2.

Keywords

Africa, Aldabra, Azores, Canary Islands, Cape Verde, Comoros, cultivated plants, identification, keys, Madagascar, Madeira, Mauritius, La Réunion, Seychelles, Solanum, weeds
Introduction

*Solanum* L. (Solanaceae) is one of the largest of angiosperm genera (Frodin 2004) with ca. 1,200 species distributed worldwide with species on all continents except Antarctica. The greatest species diversity in the genus occurs in the Neotropics (see Bohs 2005), but significant diversity also occurs in the Old World, with Africa and Australia particularly important areas for diversification (see Vorontsova and Knapp 2016; Echeverría-Londoño et al. 2018). Due to its large number of species and the number of introductions and cultivated taxa, *Solanum* is often an identification challenge for non-specialists. Recent completion of several large monographic treatments of the *Solanum* of Africa (e.g. Vorontsova and Knapp 2016; Knapp and Vorontsova 2016; Särkinen et al. 2018) as part of the US National Science Foundation funded Planetary Biodiversity Inventory project “PBI Solanum” means we can now provide keys for the genus across the continent and for adjacent islands such as Madagascar and Macaronesia. Some of these have been published in the Open Access literature (e.g. Knapp 2013; Knapp and Vorontsova 2016; Särkinen et al. 2018), but the largest of these, treating the spiny solanums (Vorontsova and Knapp 2016) is not. Several species that are either naturalised (e.g. members of the Brevantherum Clade) or cultivated (tree tomatoes, pepinos, potatoes and tomatoes) in the region are also not treated as part of these monographic treatments, although complete species descriptions and photographs are provided on the web resource Solanaceae Source (www.solanaceaesource.org).

Here we provide dichotomous keys that include all groups and species (native, naturalised and widely cultivated; see Table 1 for species list) of *Solanum* occurring in continental Africa, Madagascar (incl. the Indian Ocean islands of Mauritius, La Réunion, the Comoros, and the Seychelles), Macaronesia and the Cape Verde Islands to facilitate identification across the region. Taxa occurring in each country in the region are shown in Table 2 and a map of *Solanum* diversity (all taxa) is presented in Figure 1. Keys to individual groups are also provided for the 135 *Solanum* species occurring in the region (see Table 1 and Appendix 1 for a species list). We hope that these keys will encourage collection and documentation of *Solanum* across Africa and uncover new distributions and perhaps new species for the region.

Materials and methods

We modified keys from published monographs for groups of *Solanum* from the botanical continent “Africa” as defined in the World Geographical Scheme for Recording Plant Distributions (WGSRPD; Brummitt 2001). This corresponds basically to the countries of the continent of Africa, but excludes the Sinai Peninsula (politically part of Egypt and in WGSRPD part of Western Asia). It also includes islands grouped as Macaronesia (Azores, Canary Islands, Madeira and the Cape Verde Islands) and Madagascar and other Indian Ocean islands east to Rodrigues.
We assessed distribution using the published monographs, with additional data points added from subsequent herbarium visits. All specimens seen for these keys can be seen in the Supplemental File and in the dataset published on the NHM Data Portal (https://doi.org/10.5519/0042549). For descriptions of the taxa, users are referred to the original publications or the Solanaceae Source website (www.solanaceaesource.org), where all species treated here are described and synonymy listed.

To access descriptions on the Solanaceae Source website, begin by typing the species name in the search box in the upper right-hand part of the screen banner (tick the option “Taxonomy” below the box); when the correct name you are searching for appears, select it, then push the “Search” button to the right of the search box (if you do not push the “Search” button, nothing will happen). You will be taken to the species page, where images and synonyms appear on the opening page; to access descriptions, click on the “Description” tab where information can be obtained. Up-to-date specimen details are not currently available on the website but can be found as described above.

**Keys**

*Solanum* can be divided into 13 major clades or monophyletic groups (Bohs 2005; Weese and Bohs 2007; Särkinen et al. 2013; see Figures 2 and 3 for photographs illustrating representative morphology of these groups in Africa). The largest monophyletic clade is the *Leptostemonum* clade, or the “spiny solanums”, which comprises approximately half of the species diversity of the genus; divisions within that clade have been defined by Stern et al. (2011), Vorontsova et al. (2013) and Aubriot et al. (2016). This group is rapidly diversifying in the Old World (Echeverría-Londoño et al. 2018), with most taxa occurring in the Old World belonging to a single monophyletic group. Previous treatments (e.g. Whalen 1984; Jaeger 1985; Jaeger and Hepper 1986) had suggested the African taxa were members of, or closely related to New World groups. More information on the phylogenetic relationships of African and Asian members of the *Leptostemonum* Clade can be found in Vorontsova et al. (2013) and Aubriot et al. (2016). Other clades with significant species diversity in Africa (as defined here) are the African non-spiny (ANS) and *Normania* Clades (both endemic to the region; see Bohs and Olmstead 2001) and the *Morelloid* Clade (with a number of widespread weedy taxa, see Särkinen et al. 2018). Other clades such as the *Geminata*, *Brevantherum* and *Potato* Clades are represented only by introduced or cultivated species. The *Dulcamaroid* Clade has a single species native to Mediterranean northern Africa and Macaronesia and two cultivated taxa that can become naturalised (Knapp 2013). In order to facilitate identification and to assist with the discovery of novelties from the region, we provide a key to the major groups (clades) of *Solanum* following the most recent phylogeny of the genus (Särkinen et al. 2013) and additional dichotomous keys to the species within each group. Groups are ordered as they occur as branches in the phylogeny of Särkinen et al. (2013).
### Table 1.
The 135 species of *Solanum* (native, naturalised and widely cultivated) occurring in Africa as defined by Brummitt (2001), with their places of original publication and clade membership as currently understood (Major Clades sensu Bohs 2005; minor clades are divisions within these sensu Bohs 2007; Stern et al. 2011; Vorontsova et al. 2103; Särkinen et al. 2015, 2018; Aubriot et al. 2016; Tepe et al. 2016).

| Species                        | Place of original publication | Major Clade     | Minor clade       |
|--------------------------------|--------------------------------|-----------------|-------------------|
| *Solanum aculeastrum* Dunal    | Prodr. [A. P. de Candolle] 13(1): 366. 1852. | Leptostemonum   | Old World-Africa  |
| *Solanum aculeatissimum* Jacq. | Collectanea [Jacquin] 1: 100. 1787 [1786]. | Leptostemonum   | Acanthophora     |
| *Solanum adoense* Hochst. ex A.Rich. | Tent. Fl. Abyss. 2: 105. 1850 [1851]. | Leptostemonum   | Old World-Africa  |
| *Solanum aethiopicum* L.      | Cent. Pl. 2: 10. 1756. | Leptostemonum   | Old World-Africa  |
| *Solanum africanum* Mill.     | Gard. Dict. ed. 8, no. 26. 1768. | African non-spiny (ANS) |               |
| *Solanum agnewiorum* Voronts. | Phytotaxa 10: 32. 2010. | Leptostemonum   | Old World-Africa  |
| *Solanum agrarium* Sendtn.    | Fl. Bras. (Martius) 10: 68, fig. 5, 32–33. 1846. | Leptostemonum   | Gardneri         |
| *Solanum aldabrense* C.H.Wright | Kew Bull. 1894: 149. 1894. | Leptostemonum   | Old World-Africa  |
| *Solanum africanum* Mill.     | Gard. Dict. ed. 8, no. 5. 1768. | Morelloid       | Black nightshade |
| *Solanum americanum* Mill.    | Tabl. Encycl. 2: 23. 1794. | Leptostemonum   | Old World-Africa  |
| *Solanum anomalum* Thonn.     | Beskr. Guin. Pl. 126 1827. | Leptostemonum   | Old World-Africa  |
| *Solanum arundo* Mattei       | Boll. Reale Orto Bot. Giardino Colon. Palermo 7: 188. 1908. | Leptostemonum   | Old World-Africa  |
| *Solanum atropurpureum* Schrank | Syll. Rarisb. 1: 200. 1824. | Leptostemonum   | Acanthophora     |
| *Solanum auritomentosum* Bitter | Repert. Spec. Nov. Regni Veg. 11: 18. 1912. | Leptostemonum   | Old World-Africa  |
| *Solanum batoides* D'Arcy & Rakot. | Fl. Madag., Fam. 176: 75. 1994. | Leptostemonum   | Old World-Africa  |
| *Solanum betaceum* Cav.       | Cyphomandra                  | African non-spiny (ANS) |               |
| *Solanum betroka* D'Arcy & Rakot. | Fl. Madag., Fam. 176: 77. 1994. | Leptostemonum   | Old World-Africa  |
| *Solanum bunelii* Dunal       | Prodr. [A. P. de Candolle] 13(1): 292. 1852. | Leptostemonum   | Old World-Madagascar |
| *Solanum burchellii* Dunal    | Prodr. [A. P. de Candolle] 13(1): 291. 1852. | Leptostemonum   | Old World-Africa  |
| *Solanum campylacanthum* Hochst. ex A.Rich. | Tent. Fl. Abyss. 2: 102. 1850. | Leptostemonum   | Old World-Africa  |
| *Solanum capense* L.          | Syst. ed. 10: 935. 1759. | Leptostemonum   | Old World-Africa  |
| *Solanum capicoides* All.     | Auct. Syn. Meth. Stirp. Hort. Regii Taur. 64. 1773. | Leptostemonum   | Acanthophora     |
| *Solanum catombelense* Peyr.  | Sitzungsber. Kaiserl. Akad. Wiss., Math.-Naturwiss. Cl. 38: 576. 1860. | Leptostemonum   | Old World-Africa  |
| *Solanum cerasiferum* Dunal    | Prodr. [A. P. de Candolle] 13(1): 365. 1852. | Leptostemonum   | Old World-Africa  |
| *Solanum cerasiferum* Lam.    | Prodr. [A. P. de Candolle] 13(1): 365. 1852. | Leptostemonum   | Old World-Africa  |
| *Solanum chrysotrichum* Schildl. | Linnaea 19: 304. 1847. | Leptostemonum   | Old World-Africa  |
| *Solanum coccineum* Forssk.   | Fl. Aegypt.-Arab. 47. 1775. | Leptostemonum   | Old World-Africa  |
| *Solanum cordatum* Forssk.    | Fl. Aegypt.-Arab. 47. 1775. | Leptostemonum   | [not assigned]    |
| *Solanum croatii* D'Arcy & R.C.Keating | Phytologia 34: 282. 1976. | Leptostemonum   | Old World-Madagascar |
| *Solanum cyaneopurpureum* De Wild. | Pl. Bequaert. 1: 425. 1922. | Leptostemonum   | Old World-Africa  |
| *Solanum cymbalariifolium* Chiov. | Boll. Soc. Bot. Ital. 125: 107. 1925. | Leptostemonum   | Old World-Africa  |
| *Solanum dasyphyllum* Schumach. & Thonn. | Beskr. Guin. Pl. 126 [146]. 1827. | Leptostemonum   | Old World-Africa  |
| *Solanum demekeense* Dammer   | Bot. Jahrb. Syst. 38: 57. 1905. | Leptostemonum   | Old World-Africa  |
| *Solanum diphyllum* L.        | Sp. Pl. 184. 1753. | Geminata       |               |
| *Solanum elaeagnifolium* Cav. | Icon. 3: 22. tab. 243. 1795. | Leptostemonum   | Elacagnifolium   |
| *Solanum erianthum* D.Don     | Prodr. Fl. Nep. 96. 1825. | Leptostemonum   | Brevantherum     |
| *Solanum ericoidiformem* Dunal | Prodr. [A. P. de Candolle] 13(1): 201. 1852. | Leptostemonum   | Old World-Madagascar |
| *Solanum forkalii* Dunal      | Hist. Nat. Solanum 237. 1813. | Leptostemonum   | Old World-Africa  |
| *Solanum giganteum* Jacq.    | Collectanea [Jacquin] 4: 125. 1791. | Leptostemonum   | Old World-Africa  |
### Dichotomous keys to the species of *Solanum* L. (Solanaceae) in continental Africa...

| Species                              | Place of original publication       | Major Clade   | Minor clade                  |
|--------------------------------------|-------------------------------------|---------------|------------------------------|
| *Solanum glabratum* Dunal             | Hist. Nat. Solanum 240. 1813.       | Leptostemonum | Old World-Africa             |
| *Solanum goetzei* Dammer              | Bot. Jahrb. Syst. 28: 473. 1900.     | Leptostemonum | Old World-Africa             |
| *Solanum guineense* L.                | Sp. Pl. 184. 1753.                  | African non-spiny (ANS) |                               |
| *Solanum hastifolium* Hochst. ex Dunal | Prodr. [A. P. de Candolle] 13(1): 284. 1852. | Leptostemonum | Old World-Africa             |
| *Solanum heinianum* D’Arcy & R.C.Keating | Phytologia 34: 282. 1976.          | Leptostemonum | Old World-Madagascar        |
| *Solanum herculeum* Bohs              | Plant Syst. Evol. 228: 44. 2001.     | Normania      |                              |
| *Solanum humblotii* Dammer            | Bot. Jahrb. Syst. 38: 184. 1906.     | African non-spiny (ANS) |                               |
| *Solanum humile* Lam.                 | Tabl. Encycl. 2: 23. 1794.          | Leptostemonum | Old World-Africa             |
| *Solanum inamense* Dunal              | Prodr. [A. P. de Candolle] 13(1): 85. 1852. | African non-spiny (ANS) |                               |
| *Solanum insanum* L.                  | Sp. Pl. 188. 1753.                  | Leptostemonum | Old World-Africa             |
| *Solanum inaequiradians* Werderm.     | Notizbl. Bot. Gart. Berlin-Dahlem 12: 90. 1934. | Leptostemonum | Old World-Africa             |
| *Solanum jubae* Bitter                | Bot. Jahrb. Syst. 54: 501. 1917.     | Leptostemonum | Old World-Africa             |
| *Solanum laciniatum* Aiton            | Hort. Kew. ed. 1, 1: 247. 1789.     | Archaeosolanum |                              |
| *Solanum lamprocarpum* Bitter         | Repert. Spec. Nov. Regni Veg. Beih. 16: 107. 1923. | Leptostemonum | Old World-Africa             |
| *Solanum lanzae* J.-P. Lebrun & Stork | Candollea 50: 217. 1995.             | Leptostemonum | Old World-Africa             |
| *Solanum laticlinoiti* Wild.          | Enum. Pl. (Willdenow) 1: 238. 1809.  | Leptostemonum | Old World-Africa             |
| *Solanum lidi* Sunding                | Blytia 24: 368. 1966.               | Leptostemonum | Old World                   |
| *Solanum linnaeana* Hepper & P.-M.L. Jaeger | Kew Bull. 41: 435. 1986.         | Leptostemonum | Old World-Africa             |
| *Solanum littoraneum* A.E. Gonç.      | Kew Bull. 52(3): 703. 1997.         | Leptostemonum | Old World-Africa             |
| *Solanum hycopersicum* L.             | Sp. Pl. 185. 1753.                  | Potato        | Tomato                      |
| *Solanum macracanthum* A.Rich.        | Tent. Fl. Abyss. 2: 106. 1850.       | Leptostemonum | Old World-Africa             |
| *Solanum macroparpon* L.              | Mant. Pl. Altera: 205. 1771.        | Leptostemonum | Old World-Africa             |
| *Solanum macrothyrsum* Dammer         | Bot. Jahrb. Syst. 38: 185. 1906.     | African non-spiny (ANS) |                               |
| *Solanum madagascariense* Dunal       | Prodr. [A. P. de Candolle] 13(1): 99. 1852. | African non-spiny (ANS) |                               |
| *Solanum malvenense* D’Arcy & Rakot.  | Ann. Missouri Bot. Gard. 73: 498. 1896. | Leptostemonum | Old World-Madagascar        |
| *Solanum maldivense* Voronts.         | Syst. Bot. 35: 904. 2010.           | Leptostemonum | Old World-Africa             |
| *Solanum mammosum* L.                 | Sp. Pl. 187. 1753.                  | Acanthophora  |                              |
| *Solanum marginatum* L.f.             | Suppl. 147. 1781.                   | Leptostemonum | Old World-Africa             |
| *Solanum mauense* Bitter              | Repert. Spec. Nov. Regni Veg. Beih. 16: 42. 1923. | Leptostemonum | Old World-Africa             |
| *Solanum mauritianum* Scop.           | Delic. Fl. Faun. Insubr. 3: 16. 1788. | Brevantherum  |                              |
| *Solanum melatomoides* C.H.Wright     | Bull. Misc. Inform. Kew 1894: 128. 1894. | Leptostemonum | Old World-Africa             |
| *Solanum melongena* L.                | Sp. Pl. 186. 1753.                  | Leptostemonum | Old World-Tropical Asia      |
| *Solanum memphiticum* J.F. Gmel.      | Syst. Nat., ed. 13[13bis] 2(1): 385. 1791 | Morelloid     | Black nightshade             |
| *Solanum muriatatum* Aiton            | Hort. Kew. ed. 1, 1: 250. 1798.      | Potato        | Basarthrum                  |
| *Solanum mysoochricum* Baker          | J. Linn. Soc., Bot. 21: 426. 1885.   | Leptostemonum | Old World-Madagascar        |
| *Solanum myrioides* D’Arcy & Rakot.   | Fl. Madag., Fam. 176: 115. 1994.     | African non-spiny (ANS) |                               |
| *Solanum nava* Webb & Berthel.        | Phyt. Canar. 2. 3(2): 123. 1845.     | Normania      |                              |
| Species                        | Place of original publication                                                                 | Major Clade     | Minor clade         |
|-------------------------------|-------------------------------------------------------------------------------------------------|-----------------|---------------------|
| Solanum nigriviolaceum       | Repert. Spec. Nov. Regni Veg. Beih. 16: 163. 1923.                                           | Leptostemonum   | Old World-Africa    |
| Solanum nigrum L.             | Sp. Pl. 186. 1753.                                                                             | Morelloid        | Black nightshade    |
| Solanum nitidibaccatum Bitter | Repert. Spec. Nov. Regni Veg. 11: 208. 1912.                                                    | Morelloid        | Black nightshade    |
| Solanum pampasinnii Chiov.    | Res. Sci. Somalia Ital. 1: 128. 1916.                                                          | Leptostemonum    | Old World-Africa    |
| Solanum pauperum C.H.Wright   | Bull. Misc. Inform. Kew 1894: 127. 1894.                                                        | Leptostemonum    | Old World-Africa    |
| Solanum pectinatum Dunal      | Prodr. [A. P. de Candolle] 13(1): 250. 1852.                                                    | Leptostemonum    | Lasiocarpa          |
| Solanum phoxocarpum           | Syst. Bot. 35: 903. 2010.                                                                     | Leptostemonum    | Old World-Africa    |
| Solanum pinpinifolium L.      | Cent. Pl. 1: 8. 1755.                                                                          | Potato           | Tomato              |
| Solanum pobiliii Voronts.     | Syst. Bot. 35: 902. 2010.                                                                     | Leptostemonum    | Old World-Africa    |
| Solanum pseudopinpinum C.H.Wright | Fl. Trop. Afr. [Oliver et al.] 4, 2: 220. 1906.                                              | Morelloid        | Black nightshade    |
| Solanum pyracanthos           | Tabl. Encycl. 2: 21. 1794.                                                                    | Leptostemonum    | Old World-Madagascar|
| Solanum retroflexum Dunal     | Prodr. [A. P. de Candolle] 13(1): 50. 1852.                                                    | Morelloid        | Black nightshade    |
| Solanum rigidum Lam.          | Encycl. [J. Lamarck & al.] Suppl. 3: 775. 1814.                                               | Leptostemonum    | Old World-Africa    |
| Solanum robustum H.L.Wendl.   | Flora 27: 784. 1844.                                                                          | Leptostemonum    | Erythroxilochum     |
| Solanum ruhelotum Dunal       | Prodr. [A. P. de Candolle] 13(1): 304. 1852.                                                  | Leptostemonum    | Old World-Africa    |
| Solanum ruhriensee C.H.Wright | Uganda Prot. (H.H.Johnston) 1: 326. 1902.                                                     | African non-spiny | ANS                |
| Solanum ruwii Voronts.        | J. E. Afr. Nat. Hist. 99: 230. (2010) 2011.                                                    | Leptostemonum    | Old World-Africa    |
| Solanum sambirensene D'Arcy & Rakot. | Fl. Madag., Fam. 176: 123. 1994.                  | African non-spiny | ANS                |
| Solanum sarrachoides Sendtn.  | Fl. Bras. (Martius) 10: 18, tab. 1, fig. 1-8. 1846.                                           | Morelloid        | Black nightshade    |
| Solanum scabrum Mill.         | Gard. Dict. ed. 8, no. 6. 1768.                                                                | Morelloid        | Black nightshade    |
| Solanum schimperianum Hochst.  | Tent. Fl. Abyss. 2: 98. 1850.                                                                   | Leptostemonum    | Old World-Africa    |
| Solanum schlebenii Werderm.   | Notizbl. Bot. Gart. Berlin-Dahlem 12: 92. 1934.                                               | Leptostemonum    | Old World-Africa    |
| Solanum schumannianum Dammber | Pflanzenw. Ost-Africas C (Engler): 352. 1895.                                                | Leptostemonum    | Old World-Africa    |
| Solanum setaceum Dammber      | Pflanzenw. Ost-Africas C (Engler): 33. 1895.                                                 | Leptostemonum    | Old World-Africa    |
| Solanum stizymbrifolium Lam.  | Tabl. Encycl. 2: 25. 1794.                                                                     | Leptostemonum    | Siymbirioliolum     |
| Solanum srodomeodes Kuntze    | Revis. Gen. Pl. 3(3): 227. 1898.                                                               | Leptostemonum    | Old World-Africa    |
| Solanum somalene D'Arcy & Rakot. | Sert. Somal. 47. 1882.                                                                    | Leptostemonum    | Old World-Africa    |
| Solanum stipatostellatam Dammber | Abh. Königl. Akad. Wiss. Berlin 1894: 63. 1894.                                                | Leptostemonum    | Old World-Africa    |
| Solanum supinum Dunal         | Prodr. [A. P. de Candolle] 13(1): 289. 1852.                                                   | Leptostemonum    | Old World-Africa    |
| Solanum taenearme Vitke       | Linnaea 43: 327. 1882.                                                                         | Leptostemonum    | Old World-Africa    |
| Solanum tenerementotum Bitter | Repert. Spec. Nov. Regni Veg. 10: 547. 1912.                                                  | Morelloid        | Black nightshade    |
| Solanum terminale Forssk.     | Fl. Aegypt.-Arab. 45. 1775.                                                                   | African non-spiny | ANS                |
| Solanum testense Klotzsch      | Naturw. Reise Mossambique (Peters) 1: 237. 1861.                                               | Leptostemonum    | Old World-Africa    |
| Solanum thomsonii C.H. Wright | Fl. Trop. Afr. [Oliver et al.] 4, 2: 217. 1906.                                               | Leptostemonum    | Old World-Africa    |
| Solanum tolaema D'Arcy & Rakot. | Ann. Missouri Bot. Gard. 76: 351. 1989.                                                       | Leptostemonum    | Old World-Madagascar|
| Solanum tomentosum L.         | Sp. Pl. 188. 1753.                                                                             | Leptostemonum    | Old World-Africa    |
| Solanum torreanum A.E.Gonç.   | Kew Bull., 52(3): 706. 1997.                                                                  | Leptostemonum    | Old World-Africa    |
| Solanum torvum Sw.            | Prodr. [O. P. Swartz] 47. 1788.                                                                | Leptostemonum    | Torva               |
| Solanum trichopetiolatam D'Arcy & Rakot. | Fl. Madag., Fam. 176: 130. 1994.                | African non-spiny | ANS                |
| Solanum triflorum Nutt.       | Gen. N. Amer. Pl. 1: 128. 1818.                                                                | Morelloid        |                    |
Dichotomous keys to the species of *Solanum* L. (Solanaceae) in continental Africa...

| Species | Place of original publication | Major Clade | Minor clade |
|---------|-------------------------------|-------------|-------------|
| *Solanum triquetrum* Balf. | Prodr. [A. P. de Candolle] 13(1): 36. 1852. | Normania | |
| *Solanum truncicola* Bitter | Bot. Jahrb. Syst. 54: 435. 1917. | African non-spiny (ANS) | |
| *Solanum tuberosum* L. | Sp. Pl. 185. 1753. | Potato | Petota |
| *Solanum umbellatum* Manoko | PhytoKeys 16: 67. 2012. | Morelloid | Black nightshade |
| *Solanum undulatum* Hort. Kew. ed. 1, 1: 252. 1789. | PhytoKeys 8: 4. 2012. | Leptostemonum | Old World-Africa |
| *Solanum usambarense* Bitter & S. Knapp | Repert. Spec. Nov. Regni Veg. Beih. 16: 40. 1923. | Leptostemonum | Old World-Africa |
| *Solanum usaramense* Dammer | Pflanzenw. Ost-Africas C (Engler): 353. 1895. | Leptostemonum | Old World-Africa |
| *Solanum vepertillo* Aiton | Hort. Kew. ed. 1, 1: 252. 1789. | Leptostemonum | Old World |
| *Solanum viarum* Dunal | Prodr. [A. P. de Candolle] 13(1): 240. 1852. | Leptostemonum | Acanthophora |
| *Solanum villosum* Mill. | Gard. Dict. ed. 8, no. 2. 1768. | Morelloid | Black nightshade |
| *Solanum violaceum* Ortega | Nov. Pl. Descr. Dec. 56. 1798. | Leptostemonum | Old World-Tropical Asia |
| *Solanum virginianum* L. | Sp. Pl. 187. 1753. | Leptostemonum | Old World-Tropical Asia |
| *Solanum wendlandii* Hook. f. | Bot. Mag. 113: tab. 6914. 1887. | Wendlandii-Allophyllum | |
| *Solanum wittei* Robyns | Bull. Jard. Bot. État Bruxelles 17: 82. 1943. | Leptostemonum | Old World-Africa |
| *Solanum wrightii* Benth. | Fl. Hongk. 243. 1861. | Leptostemonum | Androcera-Cartinum |
| *Solanum zanzibarene* Varke | Linnaea 43: 326. 1882. | Leptostemonum | Old World-Africa |

**Table 2.** Country distribution of *Solanum* species in Africa (as defined here); introduced (incl. cultivated) species in brackets (epithet); taxa not included in the keys because they are known from a singleton cultivated specimen, are in italic type. All records based on specimens examined by the authors with verified identities. The status of *S. torvum* is not completely clear, but it is most likely to be introduced from the New World, so is treated as that here; *S. americanum*, on the other hand, appears to have a worldwide distribution, so is treated as native. The occurrence of *S. rigidum* in Senegal is doubtful, the specimen is very old and the label may be in error. Cultivated plants are often not collected, so the absence of records of commonly cultivated crops (e.g. *S. lycopersicum*, *S. macrocarpon*, *S. tuberosum*) should not be interpreted as lack of occurrence, merely as lack of collections. *Solanum diphyllum* was recorded from Egypt by Fawzi and Habeeb (2016) with a verifiable photograph; this Mexican species is widely cultivated and easily naturalised and is likely to be spreading around the Mediterranean.
| Country          | Species                                                                 |
|-----------------|-------------------------------------------------------------------------|
| Canary Islands  | *americanum*, (*laxum*), (*lycopersicum*), (*mauritianum*), *nava*, *nigrum*, (*pseudocapsicum*), (*robustum*), *vespertilio*, (*wendlandii*) |
| Central African | *aculeastrum*, (*aculeatissimum*), *anguivi*, *cerasiferum*, *dasyphyllum*, *giganteum*, (*lycopersicum*), *macrocarpon*, *scabrum*, (*seaforthianum*), terminale, (*torvum*), (*wrightii*) |
| Republic (CAR)  | *ceerasiferum*, *forskali*, *incanum*, *tarderemotum*, *villosum*        |
| Chad            | *americanum*, *macrothyrum*, *richardi*, *scabrum*, *tarderemotum*, terminale, (*torvum*) |
| Comoros (incl. | *americanum*, *macrothyrum*, *richardi*, *scabrum*, *tarderemotum*, terminale, (*torvum*) |
| Mayotte)        |                                                                           |
| Democratic      | *aculeastrum*, (*aculeatissimum*), *aethiopicum*, *anomalum*, *auveitomenonsum*, *campylacanthum*, *ceerasiferum*, (*chystochtrichon*), *cyanophoropureum*, *dasyphyllum*, *giganteum*, *litchensteini*, (*lycopersicum*), *macrocarpon*, (*mammosum*), (*mauritianum*), (*melogenae*), *memphiticum*, *richardi*, *runsorienae*, *scabrum*, (*seaforthianum*), *tarderemotum*, terminale, tettense, (*torvum*), (*villosum*), *wittei*, (*wrightii*) |
| Republic of the |                                                                           |
| Congo           | *aculeastrum*, *anomalum*, *dasyphyllum*, (*lycopersicum*), terminale, (*torvum*) |
| Cote d’Ivoire  | (*aculeatissimum*), *americanum*, *anguivi*, *anomalum*, *ceerasiferum*, *dasyphyllum*, (*lycopersicum*), *scabrum*, terminale, (*torvum*) |
| Djibouti        | *sonalense*                                                             |
| Egypt (incl.     | *coagulam*, (*diphyllum*), *dulcamara*, *elaeagnifolium*, *forskalli*, *incanum*, (*lycopersicum*), *macrocarpon*, (*melogenae*), *incanum*, (*lycopersicum*), *macrocarpum*, *marginatum*, *melastomoides*, (*melogenae*), *memphiticum*, *muricatum*, *scabrum*, *schimperianum*, *sonalense*, *tarderemotum*, terminale, *villosum* |
| Halweed triangle*|                                                                           |
| Equatorial Guinea| (*aculeatissimum*), *aethiopicum*, *americanum*, *anguivi*, *dasyphyllum*, *giganteum*, (*lycopersicum*), *pseudosinuosum*, *scabrum*, terminale, (*torvum*) |
| Eritrea         | *adoenae*, *americanum*, *anguivi*, *campylacanthum*, *ceerasiferum*, *coagulam*, *dasyphyllum*, *forskali*, *glabrum*, *incanum*, (*lycopersicum*), *macrocarpum*, *marginatum*, *melastomoides*, (*melogenae*), *memphiticum*, *muricatum*, *scabrum*, *schimperianum*, *sonalense*, *tarderemotum*, terminale, *villosum* |
| Ethiopia        | (*aculeatissimum*), *adoenae*, *americanum*, *anguivi*, *arundo*, *campylacanthum*, *capsicoides*, *ceerasferum*, *coagulam*, *cordatum*, *dennekeuse*, *forskali*, *giganteum*, *glabrum*, *hastifolium*, *hirutum*, *incanum*, *jubaee*, *lanzae*, (*lycopersicum*), *macrocarpum*, *marginatum*, *melastomoides*, *memphiticum*, *muricatum*, *pampasini*, *runsorienae*, *schimperianum*, *sonalense*, *tarderemotum*, terminale, tettense, *villosum*, (*wrightii*) |
| Gabon           | *aethiopicum*, *americanum*, *anguivi*, *anomalum*, *dasyphyllum*, *giganteum*, *macrocarpon*, *scabrum*, terminale, (*torvum*), (*wrightii*) |
| Gambia          | *americanum*, *anguivi*, *cerasiferum*, *dasyphyllum*                    |
| Ghana           | (*aculeatissimum*), *americanum*, *anguivi*, *anomalum*, *capsicoides*, *dasyphyllum*, (*erianthum*), *incanum*, *macrocarpon*, (*melogenae*), *scabrum*, *tarderemotum*, terminale, (*torvum*), (*wrightii*) |
| Guinea          | (*aculeatissimum*), *anguivi*, (*erianthum*), *scabrum*, *tarderemotum*, terminale, (*torvum*), (*wrightii*) |
| Guinea-Bissau   | *americanum*, *anguivi*, *cerasiferum*, *dasyphyllum*, terminale        |
| Kenya           | *aculeastrum*, (*aculeatissimum*), *aethiopicum*, *agnueiorum*, *americanum*, *anguivi*, *arundo*, (*betaceum*), *campylacanthum*, *coagulam*, *cordatum*, *dasyphyllum*, *dennekeuse*, *forskali*, *giganteum*, *goeztee*, *hastifolium*, *incanum*, *jubaee*, *lanzae*, (*lycopersicum*), *macrocarpon*, *marginatum*, *melastomoides*, *memphiticum*, *muricatum*, *scabrum*, *schimperianum*, *sonalense*, *tarderemotum*, terminale, *villosum* |
| Lesotho         | (*aculeatissimum*), (*chenopodioidae*), *lichensteini*, *retroflexum*, *scabrum*, *sodomoides*, *tarderemotum* |
| Liberia         | (*aculeatissimum*), *americanum*, *anguivi*, *anomalum*, *dasyphyllum*, (*lycopersicum*), (*mauritianum*), *scabrum*, terminale, (*torvum*) |
| Libya           | *linnaeanum*, *nigrum*, *villosum*, *virginianum*                       |
| Madagascar      | *aethiopicum*, *americanum*, *anguivi*, *bataoides*, (*betaceum*), *betroka*, *bumelisfolium*, *croatii*, *erythranthum*, *heinianum*, *humblotti*, *imamene*, *isanum*, *ivohibe*, (*lycopersicum*), *macrocarpon*, madagascariense, *mabodeirene*, (*mauritianum*), (*melogenae*), *meyosorichtrum*, *myrinsoides*, (*pseudocapsicum*), *pyrcananthos*, *richardi*, *sambianenae*, *scabrum*, (*seaforthianum*), *tarderemotum*, *tolitatae*, (*torvum*), *trichopetiolatum*, *truncicola*, (*villosum*), *violaceum* |
| Madeira (Portugal)| (*chenopodioidae*), *dulcamara*, (*laxum*), *linnaeanum*, (*lycopersicum*), *marginatum*, *nigrum*, (*pseudocapsicum*), *tricentum*, *villosum* |
| Malawi          | *aculeastrum*, (*aculeatissimum*), *aethiopicum*, *americanum*, *anguivi*, *auveitomenonsum*, *campylacanthum*, (*chystochtrichon*), *dasyphyllum*, *giganteum*, *goeztee*, *lichensteini*, *macrocarpon*, *retroflexum*, *richardi*, *scabrum*, *schumannianum*, (*seaforthiananum*), *tarderemotum*, terminale, tettense, (*torvum*), *villosum*, (*wendlandii*), (*wrightii*), *zanzybarene* |
| Mali            | *ceerasiferum*, *dasyphyllum*, *forskali*, *incanum*, (*lycopersicum*), *tarderemotum* |
| Country                        | Species                                                                                                                                 |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Mauritania                    | dasyphyllum, scabrurn, villosum                                                                                                                                                                   |
| Mauritius incl. La Réunion    | americanum, (anguivi), (chenopodioidae), erythracanthum, insanus, (lyoipersicum), (mauritianum), (melonema), richardi, tarderemotum, (torrnum), violaceum |
| Morocco                       | dulcamara, elaeagnifolium, forskalii, herculaneum, (laciniate), linnaeanum, nigrum, triflorum, villosum                                                                                             |
| Mozambique                    | aculeastrum, (aculeatissimum), aethiopicum, americanum, anguivi, aureimentosum, campylocanthum, catorubelense, dasyphyllum, giganteum, goetzei, laniparcarpum, lichtensteinii, linnaeanum, litoraneum, retroflexum, richardi, scabrurn, stipitatoutellatum, tarderemotum, tettense, torresanum, (torrnum), usambarum, (vianum), villosum, zanzibarensis |
| Namibia                       | burchelli, campylochanthum, capense, catorubelense, elaeagnifolium, nunniale, lichtensteinii, (lyoipersicum), pimpinellifolium, retroflexum, scabrurn, (seafirthianum), supinum, tarderemotum, tettense                                                                 |
| Niger                          | anguivi, forskalii, incanum, (lyoipersicum), villosum                                                                                                                                              |
| Nigeria                       | aculeastrum, (aculeatissimum), aethiopicum, americanum, anguivi, anomalum, cerasiferum, dasyphyllum, (erianthum), giganteum, incanum, (lyoipersicum), macrocarpon, melongena, scabrurn, terminale, (torrnum), villosum, (wrightii) |
| Rwanda                        | aculeastrum, (aculeatissimum), anguivi, campylochanthum, cyaneopurpureum, dasyphyllum, giganteum, tarderemotum, terminale, wittei                                                                 |
| Sao Tome e Principe           | americanum, capiscoides, (melongena), scabrurn, terminale                                                                                                                                          |
| Senegal                       | anguivi, cerasiferum, forskalii, incanum, (lyoipersicum), rigidum ?, scabrurn, tarderemotum                                                                                                                                                              |
| Seychelles                    | aldabrense, americanum, scabrurn                                                                                                                                                                   |
| Somalia                       | arundo, campylochanthum, coagulans, condatum, cymbalariafisulum, dasyphyllum, demnekene, forskalii, glabratum, hastifolium, incanum, jubae, melastomoides, (melongena), memphiticum, pampasinii, schimperianum, somalense, tarderemotum, tettense, villosum |
| South Africa                  | aculeastrum, (aculeatissimum), africanum, americanum, anguivi, burchelli, campylochanthum, capense, catorubelense, (chenopodioidae), (chrysotrichum), dasyphyllum, elaeagnifolium, giganteum, guineense, humile, (lecanum), lichtensteinii, linnaeanum, (mauritianum), (pseudoacapnium), reflexum, rubetorum, (arrachoides), (seafirthianum), isyembrifolium, sodomeodes, supinum, tarderemotum, terminale, tettense, tomentosum, torresanum, (torrnum), triflorum, (vianum), (wrightii) |
| South Sudan                   | aculeastrum, (aculeatissimum), aethiopicum, anguivi, campylocanthum, cerasiferum, coagulans, dasyphyllum, giganteum, hastifolium, scabrurn, tarderemotum, terminale                                                                                                                                 |
| Sudan incl. Hala'ib triangle* | aculeastrum, adonene, aethiopicum, campylochanthum, cerasiferum, coagulans, forskalii, hastifolium, incanum, macrocarpon, memphiticum, nigrum, scabrurn, schimperianum, somalense, tarderemotum, villosum                                                                 |
| Swaziland                     | aculeastrum, campylochanthum, catorubelense, retroflexum, (robustum), (seafirthianum), isyembrifolium, tomentosum                                                                                                                                 |
| Tanzania                      | aculeastrum, (aculeatissimum), americanum, anguivi, arundo, (atropurpureum), aureimentosum, (betaeum), campylochanthum, coagulans, cyaneopurpureum, dasyphyllum, dennekeense, giganteum, goetzei, hastifolium, inaquirodum, laniparcarpum, lanzae, lichtensteinii, (lyoipersicum), macrocarpon, mauense, (melongena), memphiticum, (pectinatum), phocoscarpum, polhilli, richardi, (robustum), scabrurn, schleberei, schumannianum, (seafirthianum), setaceum, stipitatoutellatum, taiteuse, tarderemotum, terminale, tettense, thomonii, (tuberosum), umulalnea, usambararene, usambarum, villosum, (vandlandi), wittei, (wrightii), zanzibarense |
| Togo                          | (aculeatissimum), aethiopicum, americanum, anguivi, anomalum, (melongena), scabrurn, terminale, (torrnum)                                                                                                                                                  |
| Tunisia                       | linnaeanum, (lyoipersicum), nigrum, triflorum, villosum                                                                                                                                                                                                  |
| Uganda                        | aculeastrum, (aculeatissimum), aethiopicum, americanum, anguivi, (betaeum), campylochanthum, cerasiferum, coagulans, cyaneopurpureum, dasyphyllum, giganteum, hastifolium, lanzae, macrocarpon, mauense, mauense, mauritianum, memphiticum, rumioriense, scabrurn, schumannianum, (seafirthianum), tarderemotum, terminale, tettense, villosum, wittei, (wrightii) |
| Western Sahara                | villosum                                                                                                                                                                                            |
| Zambia                        | (aculeatissimum), americanum, anguivi, aureimentosum, campylochanthum, (chrysotrichum), goetzei, lichtensteinii, (lyoipersicum), retroflexum, richardi, scabrurn, (seafirthianum), tarderemotum, terminale, tettense, (torrnum), (tuberosum), villosum, (vandlandi), (wrightii) |
| Zimbabwe                      | aculeastrum, (aculeatissimum), anguivi, aureimentosum, (betaeum), campylochanthum, catorubelense, giganteum, lichtensteinii, linnaeanum, (mauritianum), retroflexum, richardi, scabrurn, (seafirthianum), tarderemotum, terminale, villosum, (vandlandi) |

*Possession of the area known as the Hala'ib triangle is disputed between Egypt and Sudan, species occurring there are listed under both countries.
Figure 1. Heat map of Solanum diversity in Africa. Darker degree squares indicate greater species richness. The middle to high elevation regions of eastern Africa (Kenya/Tanzania) have the highest high species diversity, followed by secondary areas of species richness in the Ethiopian plateaus, dry areas of central Madagascar, South Africa and the area around Mount Cameroon. We have not analysed how collecting effort has influenced these patterns, but it is likely to be important. As the Leptostemonum Clade has the largest number of species in Africa, diversity in that clade drives species richness overall (see Vorontsova and Knapp 2016, figure 2). Map prepared by Sarah Ficinski.
Dichotomous keys to the species of *Solanum* L. (Solanaceae) in continental Africa...

Figure 2. A, B *Solanum wendlandii* Hook.f. (Allophyllum-Wendlandii Clade) C *Solanum tarderemotum* Bitter (Morelloid Clade) D *Solanum scabrum* Mill. (Morelloid Clade) E *Solanum pyracanthos* Lam. (Leptostemonum Clade) F *Solanum aculeastrum* Dunal (Leptostemonum Clade) G *Solanum nigriviolaceum* Bitter (Leptostemonum Clade) H *Solanum usambarensis* Bitter & Dammer (Leptostemonum Clade). Photos A, B, F, G H by M.S. Vorontsova C, D, E by S. Knapp.
Figure 3. A *Solanum terminale* Forssk. (African non-spiny Clade) B *Solanum madagascariense* Dunal (African non-spiny Clade) C *Solanum mauritianum* Scop. (Brevantherum Clade) D *Solanum lacinatum* Spreng. (Dulcamaroid Clade) E *Solanum trisectum* Dunal (Normania Clade) F *Solanum diphyllum* L. (Geminata Clade) G *Solanum tuberosum* L. (Potato Clade) H *Solanum laciniatum* Aiton (Archaeosolanum Clade). Photos A, C, D, E, F, G, H by S. Knapp B by M.S. Vorontsova.
Four species have been recorded from this area, for which we have only seen single specimens, all of which are cultivated and not naturalised. *Solanum laciniatum* Aiton (Archaesolanum Clade), the kangaroo apple from Australia and New Zealand, has been recorded from Morocco. *S. agrarium* Sendtn. (Leptostemonum Clade, section *Acanthophora* Dunal sensu Nee 1979) from Brazil has only recently been collected in the Cape Verde Islands and *S. atropurpureum* Schrank (Leptostemonum Clade, section *Acanthophora* Dunal sensu Nee 1979) from Brazil and *S. pectinatum* Dunal (Leptostemonum Clade, section *Lasiocarpa* Dunal sensu Whalen et al. 1981) from Mexico have been recorded from Tanzania in a botanical garden. These singletons have been included in Table 1, but not in the keys below; descriptions should be checked if identification is ambiguous.

Each species name is hyperlinked to its page on Solanaceae Source (www.solanaceaesource.org) where photographs (if available), descriptions and other information can be found. An expanded key to all of the thirteen major clades of *Solanum* worldwide is in preparation (R. Hilgenhof and T. Särkinen, pers. comm.). Instructions on how to use Solanaceae source are included in the Materials and Methods.

### Key to the groups of *Solanum* in continental Africa, Madagascar (incl. the islands of Réunion, the Comoros and the Seychelles), Macaronesia and the Cape Verde Islands

1a Trichomes of stems and leaves stellate or echinoid..................................................2

1b Trichomes of stems and leaves simple (unbranched) or dendritically branched, never stellate or echinoid..........................................................3

2a Anthers ellipsoid in outline; inflorescences many times branched; branching dichasial; stems without prickles ........................................... **Key 6. Brevantherum Clade**

2b Anthers tapering in outline; inflorescences branched or unbranched; branching monochasial; stems with or without prickles .................................................. **Key 7. Leptostemonum Clade**

3a Shrubs, small trees or woody vines ..........................................................4

3b Herbs or if plants woody, only at the base; never true vines, occasionally scandent .................................................................................9

4a Stems with hooked prickles; anthers tapering ................................................... **Solanum wendlandii** Hook.f. (Wendlandii-Allophyllum Clade)

4b Stems without prickles; anthers ellipsoid ....................................................5

5a Small trees with foetid cordate leaves; flowers waxy pink or greenish white; anther connectives enlarged; fruit a large turbinate berry with fleshy pulp; cultivated tree tomato .................................................................................. **Solanum betaceum** Cav. (Pachyphylla [Cyphomandra] Clade)

5b Shrubs or woody vines; leaves, flowers and anther connectives not as above. .................................6
6a Small shrubs with paired (geminate) leaves; flowers nodding, white; fruit held on erect pedicels, orange; cultivated or occasionally naturalised in northern Africa........................................................................................................ 7
6b Woody vines or scendent shrubs; leaves, flowers and fruit not as above; continental Africa, Madagascar; or cultivated .................................................. 8
7a Leaves lanceolate, with at least some branched trichomes on new growth; leaves of a pair more or less the same shape; inflorescence usually with 2 flowers; berry dark orange; cultivated “Jerusalem cherry”.......................................................... Solanum pseudocapsicum L. (Geminata Clade)
7b Leaves ovate or elliptic, completely glabrous; leaves of a pair markedly different in shape; inflorescence with more than 2 flowers; berry pale orange; only recorded from Egypt ................. Solanum diphyllum L. (Geminata Clade)
8a Base of pedicel enclosed in a small sleeve of rhachis tissue usually more than 0.5 mm long; Mediterranean northern Africa; Macaronesia; if in other parts of Africa, cultivated.............................................................................. Key 3. Dulcamaroid Clade
8b Base of pedicel peg-like, sometimes enclosed in a small sleeve of rhachis tissue, if so the sleeve less than 0.5 mm long; Continental tropical Africa; Madagascar; native plants ............. Key 1. African non-spiny (ANS) Clade
9a Leaves pinnate or deeply pinnatifid........................................................... 11
9b Leaves simple (at most the margins toothed) or at most ternate ................ 12
10a Fleshy prostrate herbs; leaves pinnatifid, the leaflets not distinct; inflorescences unbranched...................................... Solanum triflorum Nutt. (Morelloid Clade)
10b Spreading herbs or herbaceous scramblers, not fleshy; leaves pinnate with distinct leaflets; inflorescences branched or less often unbranched..........
.................................................................................... Key 5. Potato Clade
11a Anthers dimorphic, of different sizes and two of the five with horn-like projections; Macaronesia and northern Africa ..........Key 2. Normania Clade
11b Anthers equal in size and shape, if unequal only slightly so; widespread or cultivated........................................................................................................ 12
12a Trichomes simple with a single long terminal cell (bayonet hairs); fruit a large greenish berry with purple stripes (more than 3 cm diameter), with abundant solid mesocarp; herbaceous vine......................................................... Solanum muricatum Aiton (Potato Clade)
12b Trichomes simple or branched; fruit variously coloured (usually less than 1 cm in diameter), with juicy mesocarp; annual or short-lived perennial herbs ................................................. Key 4. Morelloid Clade
Dichotomous keys to the species of *Solanum* L. (Solanaceae) in continental Africa...

2a Inflorescence few-flowered, unbranched (at most furcate in *Solanum betroka*).. 3
2b Inflorescence many flowered, usually many times branched
3a Flowers appearing fasciculate and axillary; corolla usually somewhat campanulate; fruit orange; South Africa.............................. *Solanum guineense* L.
3b Flowers not appearing fasciculate; corolla stellate, the petals spreading or reflexed; fruit colour green, black or not known, never orange; Madagascar.... 4
4a Leaves clustered on short shoots; calyx lobes deltate, not divided to base; dry forests .................................................. *Solanum betroka* D’Arcy & Rakot.
4b Leaves not clustered on short shoots; calyx lobes long triangular, divided to the base; wet forests ......................... *Solanum truncicola* D’Arcy & Rakot.
5a Flowers or fruits (or pedicel scars) in tightly packed groups on individual branches (these sometimes very short and the inflorescence appearing spicate)................................................................. *Solanum terminale* Forssk.
5b Flowers spaced on the open inflorescence, often unevenly so ............... 6
6a Leaves clustered on short shoots........... *Solanum betroka* D’Arcy & Rakot.
6b Leaves spaced along the stem .............................................. 7
7a Anthers opening by pores that elongate with age; mountains of continental Africa............................................................. *Solanum runcioriense* C.H.Wright
7b Anthers opening by delineated pores that do not elongate with age; Madagascar............................................................................. 8
8a Leaves fleshy, thick and coriaceous, the venation not visible in dry specimens; fruit with thick pericarp (woody?) ................................................................. *Solanum myrsinoides* D’Arcy & Rakot.
8b Leaves membranous to coriaceous, not markedly thick and fleshy, the venation visible in dry specimens; fruit with thin pericarp, the seeds visible through the berry wall ................................................................. 9
9a Petioles with long, simple trichomes (these not extending to the lamina); seeds 4–8 per berry; inflorescence axis thin and delicate................................. *Solanum trichopetiolatum* D’Arcy & Rakot.
9b Petioles glabrous or with minute dendritic trichomes; seeds 20–40 per berry; inflorescence axis robust.................................................. *Solanum madagascariense* Dunal
10a Leaf trichomes simple (unbranched)................................................ 11
10b Leaf trichomes branched (dendritic to echinoid)................................. 16
11a Inflorescence axis unbranched, the flowers closely spaced................ 12
11b Inflorescence axis branched, often many times so.......................... 13
12a Leaves clustered along stem; fruit orange; South Africa.....................
............................................................................ *Solanum guineense* L.
12b Leaves spaced along shoots; fruit purple or black; Madagascar .............. *Solanum truncicola* D’Arcy & Rakot.
13a Flowers or fruits (or pedicel scars) in tightly packed groups on individual branches (these sometimes very short and the inflorescence appearing spicate)................................................................. *Solanum terminale* Forssk.
13b Flowers spaced on the open inflorescence, often unevenly so ............... 14
14a Stems strongly quadrangular; at least some leaves with shallow lobes; plants of seashore and dune habitats. ................. *Solanum africanum* Mill.

14b Stems terete; leaves not lobed; plants of forests and forest edges ......... 15

15a Leaf pubescence very sparse, confined to the midrib or near the petiole; flowers not heterostylous; Madagascar. ... *Solanum trichopetiolatum* D’Arcy & Rakot.

15a Leaf pubescence variable, not very sparse, along veins and lamina; flowers heterostylous; mountains of continental Africa ..................................................

................................................................. *Solanum runsoriense* C.H.Wright

16a Abaxial leaf surfaces with tufts of trichomes in the vein axils (domatia) .... 17

16b Abaxial leaf surfaces with trichomes on lamina and/or along veins, not with prominent tufts in the vein axils (domatia) ..........................................

17a Inflorescence many times branched, open and with many flowers (more than 20); calyx lobes broadly deltate; petioles to 4 cm long, thin and flexuous; Mayotte (Comoros). ........................................... *Solanum macrothyrsum* Dammer

17b Inflorescence furcate, more congested and with fewer flowers (fewer than 20); calyx lobes deltate; petioles to 2.5 cm long, thicker; Madagascar ............. 18

18a Calyx lobes 0.8–2 mm long; inflorescences with 10–16 flowers .................

................................................................. *Solanum ivohibe* D’Arcy & Rakot.

18b Calyx lobes 4–6 mm long; inflorescences with 3–10 flowers ..................

................................................................. *Solanum sambiranense* D’Arcy & Rakot.

19a Abaxial leaf surfaces evenly pubescent on veins and lamina ............... 20

19b Abaxial leaf surfaces pubescent only along the veins and midrib, the trichomes not extending to the lamina ................................................................. 22

20a Anther pores lengthening to slits with age; flowers heterostylous; leaves evenly distributed along branches; mountains of continental Africa ..................

................................................................. *Solanum runsoriense* C.H.Wright

20b Anther pores not lengthening to slit with age; flowers not heterostylous; leaves usually at least somewhat clustered on short shoots; Madagascar .......... 21

21a Leaves densely pubescent with golden (when dry) loosely dendritic trichomes; flowers more than 2 cm in diameter; anthers 4–6 mm long; widespread in Madagascar .................................................. *Solanum imamense* Dunal

21b Leaves sparsely pubescent with white (when dry) congested dendritic trichomes; flowers 2 cm in diameter or less; anthers 3.5–4 mm long; dry forests of southern Madagascar ................. *Solanum betroka* D’Arcy & Rakot.

22a Inflorescence unbranched, with few flowers; pedicels 1.8–4.5 cm long ........

................................................................. *Solanum humblotii* Bitter

22b Inflorescence many times branched, with many flowers; pedicels 0.8–1.2 cm long ................................................................. 23

23a Anther pores lengthening to slits with age; flowers heterostylous; pedicels with pubescence like the inflorescence rhachis; mountains of continental Africa .................................................. *Solanum runsoriense* C.H.Wright

23b Anther pores not lengthening to slit with age; flowers not heterostylous; pedicels always glabrous; Madagascar .......................... *Solanum madagascariense* Dunal
Key 2. Normania clade (descriptions on Solanaceae Source)

1a Leaves shallowly lobed, pubescent with long, tangled eglandular trichomes; anthers tapering, horned near the base, tightly connivent; seeds more than 5 mm long; fruit a dry berry; Mediterranean .......... *Solanum herculeum* Bohs

1b Leaves simple or ternate, glabrous or pubescent, but the trichomes not long and tangled, glandular; anthers markedly horned, spreading; seeds less than or equal to 5 mm long; fruit a brightly coloured, juicy berry; laurisylva forest in Macaronesia .............................................. 2

2a Leaves simple or ternate, the base truncate or cordate if leaves unlobed; anthers yellow, horned in lower third; berry bright red; Madeira .................. .......................................................... *Solanum trisectum* Dunal

2b Leaves simple, the base cordate; anthers black, horned about halfway up from the base; berry orange or red; Tenerife, Canary Islands............................... .......................................................... *Solanum nava* Webb & Berthel.

Key 3. Dulcamaroid clade (descriptions in Knapp 2013 and on Solanaceae Source)

1a Buds turbinate and strongly pointed; petals strongly reflexed, with shiny green dots at the base of each; anthers tightly connivent with “glue”; fruit a shiny red berry, often ellipsoid; native plants in Mediterranean northern Africa.......................................................... *Solanum dulcamara* L.

1b Buds rounded, often somewhat inflated; petals spreading, without shiny green dots; anthers not tightly connivent with “glue”; fruit red or black, globose; cultivated plants, occasionally naturalised throughout the region ...... 2

2a Flowers white; anthers on equal filaments; leaves with axillary tufts of trichomes on the lower surfaces (domatia), usually simple, occasionally pinnatifid; berry (very rarely) black .................................................. *Solanum laxum* Spreng.

2b Flowers purple; one filament slightly longer than the other 4; leaves completely glabrous, pinnatifid, rarely simple; berry bright shiny red .................. .......................................................... *Solanum seaforthianum* Andrews

Key 4. Morelloid clade (descriptions in Särkinen et al. 2018 and on Solanaceae Source)

1a Leaves shallowly to deeply pinnatifid .................. *Solanum triflorum* Nutt.

1b Leaves entire to sinuate-dentate ........................................ 2

2a Glandular trichomes present (e.g. along stems, petioles and leaves), plants usually sticky to touch when fresh........................................ 3

2b Glandular trichomes absent (e.g. along stems, petioles and leaves), plants not sticky to touch when fresh ........................................ 14

3a Anthers less than 1.8 mm long........................................ 4
Anthers more than or equal to 1.8 mm long...............................7

Inflorescences with 10–40 flowers; pedicels spaced 1–2 mm apart, sharply bent at the base (near articulation point) in flower and fruit ......................... Solanum tarderemotum Bitter

Inflorescences with 2–5(-10) flowers; pedicels spaced 0–1 mm apart, nodding, erect or spreading in flower and fruit, reflexed and slightly curved in some species in fruit but never in flower ........................................ 5

Calyx lobes 1–1.5 mm long in flower; fruiting calyces not accrescent, the tube remaining 1–1.7 mm long and lobes 1–1.5 mm long; fruit black when ripe, not markedly shiny, with a glaucous cast .......... Solanum retroflexum Dunal

Calyx lobes 1.5–2.5 mm long in flower; fruiting calyces accrescent, the tube 3–4 mm long and lobes 2.5–8.0 mm long; fruit green when ripe, shiny ..... 6

Leaf bases attenuate to cuneate; inflorescences mostly intermodal, with 4–8(-10) flowers; pedicels spaced 0.3–1 mm apart; calyx lobes 1.7–2.5 mm long; corollas with yellow-green central eye with black-purple V-shaped margins; anthers 1.0–1.4 mm long; berries dark green to green-brown marbled with white lines, becoming usually translucent and glossy, lower half of berries covered with enlarged calyces but berry mostly visible; seeds brown; stone cells (1-)2–3, these 0.5 mm in diameter; northern Africa ......................... Solanum nitidibaccatum Bitter

Leaf bases truncate; inflorescences mostly leaf-opposed, with 2–5(-7) flowers; pedicels spaced 0(1) mm apart; calyx lobes 1.5–2.0 mm long; corolla with yellow-green or translucent basal star without black-purple colouration; anthers 1.2–2.0 mm long; berries pale green, shiny becoming dull, opaque, usually completely enveloped by enlarged calyces; seeds pale yellow; stone cells 4–6, these (0.5-)0.8–1 mm in diameter; only known from South Africa ........................................ Solanum sarrachoides Sendtn.

Anthers more than or equal to 2.8 mm long...............................8

Anthers less than 2.8 mm long.................................................. 9

Inflorescences with bracteoles present in most individuals; buds narrowly ellipsoid; corolla deeply stellate, the lobes narrowly lanceolate; berries with more than 30 stone cells ....................... Solanum triflorum Nutt.

Inflorescences never with bracteoles; buds globose, ovoid or narrowly ellipsoid; corolla rotate-stellate, the lobes long- triangular with rounded tips; berries with (0-)2–4 stone cells .................. Solanum memphiticum Forssk.

Calyx lobes appressed to spreading in fruit, never strongly reflexed .... 10

Calyx lobes strongly reflexed in fruit ........................................... 12

Calyx accrescent in fruit, calyx tube 3–4 mm long and lobes 2.5–8 mm long ...................................................... Solanum sarrachoides Sendtn.

Calyx not accrescent in fruit, calyx tube 1–2 mm long and lobes 1–1.5 mm long ................................................. 11
| 11a | Buds ellipsoid; calyx tube 1.5–2.0 mm long, lobes 1–1.5 mm long, elongate-deltate with rounded tips; fruiting pedicels persist when fruits mature and fall off; Cameroon line (Cameroon and Equatorial Guinea), above 2,000 m elevation | Solanum pseudospinosum C.H.Wright |
| 11b | Buds subglobose; calyx tube 0.8–1.0 mm long, lobes 0.5–0.8 mm long, triangular with rounded to acute tips; fruiting pedicels generally do not persist and fall off with maturing fruits; in continental Africa only in South Africa and around the Mediterranean | Solanum nigrum L. |
| 12a | Leaves rhomboidal to lanceolate; filaments 1.2–1.5 mm long, anthers 1.3–1.8(-2) mm long; seeds 1.6–1.8 mm long and 1.3–1.5 mm wide | Solanum retroflexum Dunal |
| 12b | Leaves broadly to narrowly ovate to elliptic; filaments 0.5–1.3 mm long; anthers 1.8–2.5 mm long and 1.5–1.7 mm wide | |
| 13a | Calyx with broad and relatively transparent sinuses, lobes elliptic to triangular, rounded at tip; free part of the filaments 1.0–1.3 mm long; mature berries slightly ellipsoidal, shiny yellow, orange or red; stone cells always absent | Solanum villosum Mill. |
| 13b | Calyx with narrow, sharp triangular sinuses, lobes deltate with acute or rounded tips; free part of the filaments 0.5–0.7 mm long; mature berries round, dull black or green; stone cells 0–4; in Africa only in South Africa and around the Mediterranean | Solanum nigrum L. |
| 14a | Anthers less than 1.8 mm long | |
| 14b | Anthers more than or equal to 1.8 mm long | 17 |
| 15a | Pedicels spaced 1–2 mm apart, pedicels sharply bent at the base (near the articulation point) in flower and fruit | Solanum tarderemotum Bitter |
| 15b | Pedicels spaced 0–0.5 mm apart, pedicels nodding, erect or spreading in flower and fruit | 22 |
| 16a | Leaves with entire margins, occasionally sinuate-dentate; calyx lobes 0.3–0.5 mm long in flower, 1(-2) mm in fruit; mature fruits black, the surface very shiny | Solanum americanum Mill. |
| 16b | Leaves shallowly toothed, occasionally entire; calyx lobes 1.0–1.5 mm long in flower, 1.5–2 mm in fruit; mature fruits purple-black or green, the surface dull | Solanum retroflexum Dunal |
| 17a | Anthers less than 2.8 mm long | 18 |
| 17b | Anthers more than or equal to 2.8 mm long | 27 |
| 18a | Berries without stone cells | 19 |
| 18b | Berries with 2–22 stone cells | 24 |
| 19a | Pedicels persisting and not dropping with mature fruits; calyx lobes in fruit mostly strongly reflexed | 20 |
| 19b | Pedicels dropping with mature fruits; calyx lobes in fruit appressed to slightly spreading, rarely strongly reflexed | 22 |
20a Leaves rhomboidal to lanceolate; filaments 1.2–1.5 mm long, anthers 1.3–1.8(-2) mm long; seeds 1.6–1.8 mm long and 1.3–1.5 mm wide..............
........................................................................................................ S  

20b Leaves broadly to narrowly ovate to elliptic; filaments 0.5–1.3 mm long; anthers 1.8–2.5 mm long; seeds 1.8–2.2 mm long and 1.5–1.7 mm wide....

21a Calyx with broad and relatively transparent sinuses, lobes elliptic to triangular, rounded at tip; filaments 1.0–1.3 mm long; mature berries slightly ellipsoid, shiny yellow, orange or red; stone cells always absent
........................................................................................................... S  

21b Calyx with narrow, sharp triangular sinuses, lobes deltate with acute tips; filaments 0.5–0.7 mm long; mature berries round, dull black or green; stone cells generally absent (2–4 stone cells common in Asian material)...............  
........................................................................................................... S  

22a Buds elongate-oblong; fruiting peduncles strongly deflexed at the base (bent downwards at junction with the stem) ........S  

22b Buds ellipsoid to subglobose; fruiting peduncles straight or ascending......

23a Pedicels spaced 1–2 mm apart, sharply bent at the base (near the articulation point) in flower and fruit; seeds 1.5–2 mm long and 1–1.5 mm wide.......  
........................................................................................................... S  

23b Pedicels spaced 0–0.7 mm apart, straight, spreading or reflexed in flower and fruit; seeds 1.8–2 mm long and 1.5–1.6 mm wide..... S  

24a Prostrate herb; leaves narrowly elliptic to lanceolate, base strongly attenuate; inflorescences with 1–5 flowers; pedicels stout and spreading; calyx lobes linear-oblong with rounded apices; mountains of Ethiopia  
........................................................................................................... S  

24b Upright or spreading herb; leaves broadly ovate to elliptic, base acuminate, acute, obtuse, truncate to abruptly attenuate; inflorescences with 2–40 flowers; pedicels thinner, spreading to strongly reflexed; calyx lobes triangular, broadly deltoid or ovate with acute to rounded apices
........................................................................................................... S  

25a Pedicels strongly bent downwards at the base (near articulation point) in flower and fruit..............................  

25b Pedicels spreading, stout or pendent in flower, occasionally recurved in fruit but never strongly bent downwards at the base ........................................26  

26a Inflorescences unbranched or more often branched, often with small leaves (bracteoles?); calyx lobes broadly deltate to mere enations of the rim; style exserted 1.0–1.5 mm beyond anther cone; mature berries 3–4(-5) mm in diameter, dull yellowish brown .............. S  

26b Inflorescences unbranched, never with small leaves; calyx lobes triangular; style exserted 0–1 mm beyond anther cone; mature berries 6–10 mm in diameter, dull black.............................. S  

27a Inflorescences with bracteoles present in most individuals; buds narrowly elliptic; berries with more than 30 stone cells .......... S  

27b Inflorescences never with bracteoles; buds globose, ovoid or narrowly ellipsoid; berries with 0–14 stone cells..........................28
28a Berries with 2–14 stone cells; leaf base strongly attenuate ..........................
   .................................................................................. Solanum hirtulum C.H.Wright
28b Berries without stone cells; leaf base not strongly attenuate.................29
29a Buds elongate-oblong; calyx lobes broadly deltate to triangular with acute tips; fruiting peduncles strongly bent at the base near junction with the stem; fruiting pedicels thin, reflexed and slightly recurved; seeds 1.2–1.4 mm long and 1.0–1.2 mm wide................................. Solanum chenopodioides Lam.
29b Buds globose-subglobose; calyx lobes broadly deltate with rounded tips; fruiting peduncles straight; fruiting pedicels stout, erect and spreading; seeds 2–2.8 mm long and 1.5–1.8 mm wide ............... Solanum scabrum Mill.

Key 5. Potato clade (descriptions on Solanaceae Source)

1a Flowers yellow; anthers tightly connivent and tapering to a beak-like tip; fruit a bright red berry; cultivated tomatoes.................................................................2
1b Flowers white or purple; anthers ellipsoid, not tapering to a beak-like tip; fruit green or whitish green (often with purple stripes)......................................3
2a Corolla lobes deltate to triangular; anther cone stout, the style included; berry usually more than 1 cm in diameter (often much larger), fewer than 20 per infructescence; leaflets with serrate margins; cultivated tomato .......................
   .................................................................................. Solanum lycopersicum L.
2b Corolla lobes narrowly triangular; anther cone long and narrow, the style exserted; berry less than 1 cm in diameter, more than 20 per infructescence; leaflets with entire margins; cultivated currant tomato ...........................................................
   .................................................................................. Solanum pimpinellifolium L.
3a Leaves at most ternate, usually simple; fruit a berry more than 3 cm in diameter; plant not bearing underground tubers; cultivated pepino ......................
   .................................................................................. Solanum muricatum Aiton
3b Leaves pinnate; fruit a berry less than 3 cm in diameter; plant bearing underground tubers; cultivated potato ................................................................. Solanum tuberosum L.

Key 6. Brevantherum clade (descriptions on Solanaceae Source)

1a Young flower buds turbinate; calyx densely pubescent within over entire surface; young stems sulcate; axillary leaves absent...................................................
   .................................................................................. Solanum erianthum D.Don
1b Young flower buds oblong to orbicular; calyx lobes pubescent within only in distal quarter; young stems terete; axillary leaves common...........................
   .................................................................................. Solanum mauritianum Scop.
Key 7. Leptostemonum clade (descriptions in Vorontsova and Knapp 2016 and on Solanaceae Source)

1a Young stems and petioles noticeably winged; mature fruit densely pubescent; invasive plant in Tanzanian highlands and South Africa ................................................. Solanum robustum H.Wendl.

1b Young stems and petioles not markedly winged (terete or slightly ridged); mature fruit glabrous; native or invasive, widespread .............................. 2

2a Flowers with stamens of differing lengths (due either to unequal anthers or unequal filaments or both); arid eastern and north-eastern Africa ................... 3

2b Flowers with all stamens equal in length; widespread .................................. 8

3a Corolla strongly zygomorphic, with the two lower lobes much larger; flowers often enantiostylous; Canary Islands ......................................................... 4

3b Corolla only weakly zygomorphic, the lower lobes somewhat but not mark- edly larger; flowers not enantiostylous; continental Africa ...................... 5

4a Leaves narrowly elliptic to lanceolate; calyx lobes linear and awn-like; corolla always 5-merous; ripe berry orange; Gran Canaria ... Solanum lidii Sunding

4b Leaves ovate; calyx lobes linear; corolla often 4-merous; ripe berry yellow or yellowish green; Tenerife and Gran Canaria .......... Solanum vespertilio Aiton

5a Leaves orbicular to reniform, 1.2–2.5 cm long, wider than long; petioles longer than leaves; rare in north-eastern Somalia .............................................. Solanum cymbalariifolium Chiov.

5b Leaves ovate to elliptic or lanceolate, 2–14 cm long, longer than wide; peti- oles shorter than leaves; arid eastern and north-eastern Africa .................. 6

6a Stem prickles dense, acicular, less than 0.5 mm wide at base, pale yellow; fruit fully concealed by the accrescent calyx ............................. Solanum coagulans Forssk.

6b Stem prickles absent or sparse, if present wider than 1 mm at base, yellow to orange or brown; fruit at least partly exposed ....................................... 7

7a Leaves subentire to lobed; anthers of equal length; seeds very dark brown to almost black ............................................. Solanum melastomoides C.H.Wright

7b Leaves entire; one anther much longer than the others; seeds dull yellow to orange-brown .......................................................... Solanum somalense Franch.

8a Flower one per inflorescence, peduncle and rhachis absent; corolla pentagonal, lobed for 1/4–1/3 of the way to the base, 0.9–1.3 cm in diameter; southern Africa ................................................................. Solanum supinum Dunal

8b Flower usually more than one per inflorescence, peduncle and/or rhachis present in at least some inflorescences; corolla usually stellate, lobed for more than 1/3 of the way to the base or, if lobed, for 1/4–1/3 of the way to the base then corolla of long-styled flowers broader than 1.3 cm in diameter; widespread .... 9

9a Trichomes on young stems and adaxial (upper) surfaces of the leaves simple only, never stellate .......................................................... 10

9b Trichomes on young stems and adaxial (upper) surfaces of the leaves stellate ... 13
Dichotomous keys to the species of *Solanum* L. (Solanaceae) in continental Africa...

10a Flowers pale bluish purple; anthers 8–12.5 mm; fruit globose or extended into a “nipple” .................................................. *Solanum mammosum* L.

10b Flowers white or greenish white; anthers 5–7.5 mm; fruit globose ..........11

11a No stellate hairs anywhere on the plant; fruit bright orange at maturity; seeds winged, 4–6 mm long.................................*Solanum capsicoides* All.

11b Stellate hairs almost always present on the abaxial (lower) surface of the leaves; fruit yellow at maturity; seeds not winged, 1.8–2.8 mm long.........................

12a Leaf lobes 2–3 pairs, extending 1/3–1/2 distance to the midvein; calyx lobes 5–6.5 mm long, often caudate ....................... *Solanum aculeatissimum* Jacq.

12b Leaf lobes 3–5 pairs, extending less than 1/3 of the distance to the midvein; calyx lobes 0.8–2 mm long, acute ............... *Solanum viarum* Dunal

13a Leaves entire, 3–10 times longer than wide; shrubs erect, 1–6 m tall; stem trichomes with partly fused rays; southern Madagascar ..................... 14

13b Leaves entire or lobed, 1–3(8) times longer than wide; shrubs erect, scandent or climbing, 0.2–6 m tall; if leaves entire and more than 3 times longer than wide, then shrub less than 1 m tall and not in southern Madagascar; stem trichomes with free rays ........................................................................ 16

14a Leaves 9–13(20) cm long; corolla 2–3.1 cm in diameter; juvenile branches with dark red prickles; south-eastern Madagascar ................................................................. *Solanum croatii* D’Arcy & Keating

14b Leaves 1.5–7 cm long; corolla 1–2 cm in diameter; juvenile branches with grey-brown or red-brown prickles; south-western Madagascar ........................ 15

15a Leaf blades 3–7 cm long, concolorous to weakly discolorous, yellow-green... ........................................................................ *Solanum bumeliifolium* Dunal

15b Leaf blades 1.5–3(4) cm long, strongly discolorous, green-brown adaxially and glaucous abaxially..................*Solanum heinianum* D’Arcy & Keating

16a Prickles and leaf venation noticeably dark orange to red, contrasting with the yellow-green to red-green leaf surface; southern Madagascar .......................................... *Solanum pyracanthos* Lam.

16b Prickles and leaf venation not a contrasting colour, yellow to green or red-brown; widespread or naturalised............................................ 17

17a Mature fruit green, never developing to bright yellow, orange or red; plants weakly andromonoecious; fruits 1–1.5 cm in diameter ................................................ 18

17b Mature fruit yellow, orange or red; plants hermaphroditic or andromonoecious, fruits 0.5–6 cm in diameter, if andromonoecious, then fruits more than 1.5 cm in diameter........................................ 19

18a Shrub to tree 1.5–9 m tall; young stems and leaves densely ferruginous pubescent; trichomes on the inflorescences and pedicels not glandular; prickles straight to slightly curved............................... *Solanum chrysotrichum* Schltdl.

18b Shrub to 3 m; young stems and leaves pubescent green to brownish; trichomes on the inflorescences and pedicels glandular; prickles curved.......................... *Solanum torvum* Sw.
19a Mature fruit yellow or greenish yellow, 1.5–5(6) cm in diameter; corolla on long-styled flowers (1.3)2–6 cm in diameter; plants mostly andromonoecious.................................................................20
19b Mature fruit orange to red, 0.5–1.2(1.7) cm in diameter; if mature fruit orange (1)1.5–2.5(5) cm in diameter, the plant cultivated; corolla on long-styled flowers 0.8–3 cm in diameter; plants mostly hermaphroditic ........45
20a Cultivated tree 5–10 m tall with copious flowers; corolla bright purple aging to white with both colours usually present in an inflorescence, 5.5–8 cm in diameter .............................................................Solanum wrightii Benth.
20b Wild plants or cultivated vegetables, less than 6 m tall; corolla white to mauve or purple with the colour constant within each individual, 1.6–6 cm in diameter ..........................................................................................21
21a Petiole usually decurrent, leaf bases attenuate (cuneate); trichomes on abaxial leaf surface (if present) stalked with 4(5) rays .................................................................22
21b Petiole never decurrent, leaf bases cordate to cuneate; trichomes on abaxial leaf surface (if present) sessile or stalked with 6–16 rays .......................................................23
22a Plant clearly stellate-pubescent and armed, drying yellow-green to red-brown; wild plant ..................................................Solanum dasymphyllum Schumach, & Thonn.
22b Plant usually glabrous and unarmed, drying a distinctive red-brown colour; cultivated plant ................................................................................................................24
23a Climbers or scandent plants .........................................................................24
23b Plants erect or rarely semi-scandent .................................................................27
24a Prickles on young stems straight ...................................................................25
24b Prickles on young stems strongly curved ........................................................26
25a Prickles pale straw-yellow, to 20 mm long; petiole with sessile stellate trichomes; corolla ca. 2.5 cm in diameter; style strongly curved; Mediterranean northern Africa (adventive from Asia) ..................Solanum virginianum L.
25b Prickles yellow (but not straw-coloured) or brown; petiole trichomes usually stalked; corolla 3.5–5 cm in diameter; style straight; southern Kenya..........................
..............................................................................................................Solanum nigriviolaceum Bitter
26a Corolla white, 1.3–1.6 cm in diameter; seeds 5.5–6 mm long; Kenyan mountains ..................................................................................................................Solanum agnewiorum Voronts.
26b Corolla mauve to purple, 3.5–6 cm in diameter; seeds 3–4 mm long; eastern and southern Africa, Madagascar ..........................................................Solanum richardii Dunal
27a Calyx inflated, fully covering the berry at maturity; young stems densely covered with straight prickles; northern Madagascar .......................................................Solanum mahoriense D’Arcy & Rakot.
27b Calyx not inflated, the berry exposed at maturity; young stems prickly or unarmed; widespread .............................................................................................................28
28a Corolla lobed for more than half way to the base; shrubs or trees up to 6 m; variety of habitats.................................................................29
28b Corolla lobed for half way to the base or less; small shrubs up to 2 m; weeds of open arid environments or cultivated crops; relatives of the eggplant....35
29a Leaves 8–18 cm long, strongly discolorous; young fruits plain green; seeds 3.5–4.5 mm long; wet upland habitats..........................30

29a Leaves 2–8 cm long, concolorous or sometimes discolorous; young fruits striped in different shades of green; seeds 2.2–3.5 mm long; arid upland or lowland habitats..........................32

30a Fruit globose, never apiculate, 1.4–1.7 cm in diameter, 4–10 per infructescence; young stems with yellow (when dry) long-stalked trichomes, the stalks 1–3 mm..................................................*Solanum thomsonii* C.H.Wright

30b Fruit turbinate or cone-shaped, sometimes globose, usually somewhat apiculate, 2.8–5 x 1.8–4.5 cm, 1–3(5) per infructescence; young stems usually lacking long-stalked yellow (when dry) trichomes..........................31

31a Fruit distinctly turbinate or cone-shaped, 2.8–3.7 x 1.8–2.2 cm; leaves on fertile branches elliptic and subentire, 6–8 x 2.5–4 cm, ca. 2.5 times longer than wide; 2100–3000 m elevation...........*Solanum phoxocarpum* Voronts.

31b Fruit globose, usually somewhat apiculate, 3–5 x 2–4.5 cm; leaves on fertile branches ovate(elliptic) and lobed(subentire), 8–15 x 6–12 cm, 1.5–2 times longer than wide; 1200–2100(3200) m elevation ..........................................................*Solanum aculeastrum* Dunal

32a Prickles straight or occasionally curved; petioles 1/3–2/3 as long as the leaf blades.............................................*Solanum polhillii* Voronts.

32b Prickles on young stems strongly curved; petioles less than 1/3 of the leaf blade length........................................... 33

33a Leaves entire, densely stellate-pubescent on both sides; eastern and north-eastern African highlands ....................*Solanum dennekense* Dammer

33b Leaves lobed, adaxially glabrescent; eastern and north-eastern Africa ......34

34a Leaves 2–4 cm long; curved prickles on young stems 5–10 mm long; eastern and north-eastern Africa ....................*Solanum arundo* Matthei

34b Leaves 6–8 cm long; curved prickles on young stems 1–3 mm long; coastal Kenya, rare.............................................*Solanum malindiense* Voronts.

35a Fruit with soft pericarp, in a variety of shapes and colours, edible; common fasciation in the flowers (e.g. increase in the number of flower parts up to 8), inflated ovaries; cultivated species ......................*Solanum melongena* L.

35a Fruit spherical, yellow, with comparatively hard pericarp, not edible; flowers 5-merous; wild plants ..........................................................36

36a Leaves lobed with primary and secondary lobes, the primary lobes extending 2/3–3/4 of the distance to the midvein and secondary lobes always present; southern Africa and northern African coasts around the Mediterranean..............................................*Solanum linnaeanum* Hepper & P.M-L.Jaeger

36b Leaves entire or lobed, lobes extending up to 2/3 of the distance to the midvein, secondary lobes usually not present; widespread ................................37
37a Leaf margins and venation nearly white and contrasting with greenish red-brown adaxial leaf surface; trichomes on the abaxial surface of the leaves with 10–17 rays; Ethiopian highlands. \textit{Solanum marginatum} L.f.

37b Leaf margins and venation the same colour as the rest of the leaf blade; trichomes on the abaxial surface of the leaves with 5–12(15) rays; widespread. \textit{Solanum marginatum} L.f.

38a Leaf lobes apically obtuse to acute, sometimes rounded, sometimes with secondary lobes; lobes 1/4–2/3 of the distance to the midvein; leaves and young stems glabrescent to moderately pubescent. \textit{Solanum marginatum} L.f.

38b Leaf lobes apically rounded, sometimes obtuse, never with secondary lobes; lobes up to 1/3(1/2) of the distance to the midvein; leaves and young stems usually densely pubescent. \textit{Solanum marginatum} L.f.

39a Calyx lobes on long-styled flowers 7–10 mm long, ovate and foliaceous, apically obtuse; South Africa. \textit{Solanum marginatum} L.f.

39b Calyx lobes on long-styled flowers 4–7 mm long, deltate or long-triangular apically acuminate; northern Africa and Cape Verde Islands. \textit{Solanum marginatum} L.f.

40a Calyx lobes on long-styled flowers 4–7 mm long, deltate, ca. 1/6 as long as the fruit at maturity; continental Africa north of the equator. \textit{Solanum marginatum} L.f.

40b Calyx lobes on long-styled flowers 6–7 mm long, long triangular, 1/2 to 1/3 as long as the fruit at maturity; Cape Verde Islands (Senegal?). \textit{Solanum marginatum} L.f.

41a Prickles straight; corolla on long-styled flowers 1.8–2.5 cm in diameter; anthers ca. 4.5 mm long; Madagascar; Mauritius, Réunion. \textit{Solanum marginatum} L.f.

41b Prickles curved or straight; corolla on long-styled flowers 2.5–4.5 cm in diameter; anthers 5–9 mm long; widespread. \textit{Solanum marginatum} L.f.

42a Leaves usually entire, sometimes lobed; trichomes on the abaxial leaf surface sessile or with stalks up to 0.1 mm long; fruits 1.5–3 cm diameter. \textit{Solanum marginatum} L.f.

42b Leaves lobed; trichomes on the abaxial leaf surface with stalks up to 0.5(1) mm long; fruits 2.5–4.5 cm diameter. \textit{Solanum marginatum} L.f.

43a Leaves velvety red-brown adaxially; calyx lobes on long-styled flowers ovate to oblong, foliaceous, 7–10 mm long. \textit{Solanum marginatum} L.f.

43b Leaves yellow-green to green-brown adaxially; calyx lobes on long-styled flowers deltate, usually not foliaceous, 2.5–6 mm long. \textit{Solanum marginatum} L.f.

44a Leaves concolorous to weakly discolorous, indumentum yellowish; leaves ca. 1.5 times longer than wide; young stems terete to angular; north-eastern Africa. \textit{Solanum marginatum} L.f.

44b Leaves strongly discolorous, indumentum dirty greenish brown adaxially and whitish yellow abaxially; leaves 1.5–2.5 times longer than wide; young stems with somewhat raised longitudinal ridges; southern Africa. \textit{Solanum marginatum} L.f.
| Step | Description                                                                 | Reference                          |
|------|-----------------------------------------------------------------------------|------------------------------------|
| 45a  | Leaves on fertile branches with distinct lobes, at least some of the lobes longer than 1/4 of the distance from the midvein to the leaf edge | Solanum elaeagnifolium Cav.       |
| 45b  | Leaves on fertile branches entire or subentire or with some shallow lobes no longer than 1/4 of the distance from the midvein to the leaf edge | Solanum glabratum Dunal            |
| 46   | Leaves more than 3 times longer than wide                                   | Solanum sodomaeodes Kuntze         |
| 47a  | Plant unarmed or prickles straight, orange to red; trichomes on the abaxial surfaces of the leaves with (9)12–14 rays | Solanum rubetorum Dunal            |
| 47b  | Plant densely armed with curved broad-based pale-yellow prickles; trichomes on the abaxial surfaces of the leaves, if present, with 0–8 rays | Solanum sisymbriifolium Lam.       |
| 48a  | Anthers 2.5–3.2 mm long; trichomes anywhere on the plant with 0–4 rays; South Africa | Solanum cyaneopurpureum De Wild.   |
| 48b  | Anthers 5–6.5 mm long; trichomes anywhere on the plant with 5–8 rays; north-eastern Africa | Solanum violaceum Ortega           |
| 49a  | Leaves with at least some secondary lobing present                          | Solanum anguivi Lam.               |
| 49b  | Leaves lobed once only                                                       | Solanum aethiopicum L.             |
| 50a  | Flowers 3–7 per inflorescence, mauve to purple; anthers 5.5–7 mm long; South Africa | Solanum violaceum Ortega           |
| 50b  | Flowers 6–50 per inflorescence, white; anthers 9–10 mm long; invasive in South Africa and Kenya | Solanum anguivi Lam.               |
| 51a  | No prickles visible anywhere on the plant                                    | Solanum bistortum De Wild.         |
| 51b  | At least some prickles visible on the plant                                 | Solanum bistortum De Wild.         |
| 52a  | Plant scandent or scrambling, sometimes erect; anthers (4)5–6.5 mm long; inland eastern Africa | Solanum bistortum De Wild.         |
| 52b  | Plant erect; anthers 2.3–5(8.5) mm long; widespread                         | Solanum bistortum De Wild.         |
| 53a  | Corolla 1.5–3 cm in diameter; mauve or purple; southern Africa, Indian Ocean islands | Solanum bistortum De Wild.         |
| 53b  | Corolla 0.9–1.5 cm in diameter; white (only occasionally pale violet); widespread | Solanum bistortum De Wild.         |
| 54a  | Fruiting pedicels deflexed, curved; anthers 3.5–5.2 mm long; South Africa and Réunion | Solanum bistortum De Wild.         |
| 54b  | Fruiting pedicels straight and spreading; anthers 4.5–8.5 mm long; Mauritius and Réunion | Solanum bistortum De Wild.         |
| 55a  | Inflorescences 2.5–6 cm long, with 5–22 flowers                             | Solanum anguivi Lam.               |
| 55b  | Inflorescences 1–2.5 cm long, with 1–4(10) flowers                          | Solanum anguivi Lam.               |
| 56a  | Leaf blades 5–18 cm long, petioles 1–4 cm long; plant cultivated for leaves or fruits, widespread | Solanum aethiopicum L.             |
| 56b  | Leaf blades 3–8 cm long, petioles 0.5–1.5 cm long; wild plant in southern Africa | Solanum catombelense Peyr.         |
| 57a  | Prickles on young stems predominantly curved                                 | Solanum catombelense Peyr.         |
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63a Calyx in flower 7–9 mm long, apically caudate; calyx in fruit 10–12 mm long; trichomes with midpoints much longer that the rays; Tanzanian high- lands, rare ..............................................................................Solanum inaequiradians Bitter
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| 94a | Leaf base cuneate to acuminate; anthers 3.5–4 mm long; stem trichomes with midpoints 0.4–1(2) mm long; Democratic Republic of the Congo, Rwanda, Uganda, Tanzania; rare | 1500–2600 m | Democratic Republic of the Congo, Rwanda, Uganda, Tanzania |
| 94b | Leaf base rounded, rarely cuneate; anthers 4–6 mm long; stem trichomes with midpoints 0.05–0.2 mm long; widespread | 1000–1800 m | Democratic Republic of the Congo, Rwanda, Uganda, Tanzania |
| 95a | Leaves elliptic, with 8–12 pairs of primary veins, 2.5–3.5 times longer than wide | 1200–1500 m | Democratic Republic of the Congo, Rwanda, Uganda, Tanzania |
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| 97b | Leaf base rounded, rarely cuneate; anthers 4–6 mm long; stem trichomes with midpoints 0.05–0.2 mm long; widespread | 1000–1800 m | Democratic Republic of the Congo, Rwanda, Uganda, Tanzania |
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Supplementary material 1

List of *Solanum* species occurring in Africa as defined in this paper
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Data type: species data
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Supplementary material 2

Specimens examined by the authors for the preparation of these keys
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