

Solanum (Solanaceae) in Uganda

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ABSTRACT

Of the 41 species, subspecies and cultivar groups in the genus *Solanum* L. (Solanaceae) that occur in Uganda, about 30 are indigenous. In Uganda several members of the genus are utilised as food crops while others are put to medicinal and ornamental use. Some members are notorious weeds. A key to the species and descriptions of all *Solanum* species occurring in Uganda are provided.

UITTREKSEL

Van die 41 spesies, subspesies en kultivargroepe in die genus *Solanum* L. (Solanaceae) wat in Uganda voorkom, is sowat 30 inheems. Verskeie lede van die genus word as voedselgewasse benut, terwyl ander vir geneeskundige en ornamentele gebruike aangewend word. Sommige lede is welbekend as onkruid. 'n Sleutel tot die spesies en beskrywings van al die *Solanum*-spesies wat in Uganda voorkom word voorsien.

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INTRODUCTION

The genus *Solanum* L. belongs to the family Solanaceae, and contains about 2 000 species of which about 35 occur in Uganda. Several species are important food crops, yielding edible fruits and leaves whereas others are ornamentals or weeds (Heine 1963).

The genus also contains plants of medicinal value. For example the fruits of *S. anguivi* Lam. contain alkaloids used in the treatment of a number of diseases including chronic respiratory diseases (Bector *et al.* 1971). Walters (1965) observed that *Solanum* alkaloids have antifungal effects. Thus it is possible that some of these alkaloids could be used as antibiotics. Beaman-Mbaya & Muhammed (1976) reported that alkaloids from fruits of *S. incanum* L. are used in treatment of cutaneous mycotic infections and other pathological conditions in Kenya. In Uganda, the soup from green fruits of *S. anguivi* Lam. is popular especially among women, for it is believed to cure hypertension (Sengendo 1982).

The genus is widely distributed throughout the world with major species representation in America, Australia and Africa. The genus was first studied by Dillenius (1732) and later by Linnaeus (1753). Since 1753 the genus has been reclassified innumerable times and a multitude of varieties, subspecies and species have been named, especially in the section *Solanum*. For example, Dunal (1813) in his monograph of the genus, described 60 species belonging to section *Solanum*. Bitter (1912, 1913, 1917, 1919, 1921, 1922, 1923) was the second worker to attempt to monograph the genus; he is criticized for being

'more of a splitter than Dunal, and he described more than 60 new *Solanum* species from the Americas alone' (Edmonds 1977). He recognised 20 sections for the genus, and revised *Solanum* in Africa utilizing mainly collections from German expeditions. He erected a partial classification of *Solanum*.

The validity of some of Bitter's varieties has been questioned because they were based on minor variations which are of very limited taxonomic value. However, his work is the most detailed treatment so far available on African *Solanum*.

D'Arcy (1972) provided a modern classification of the genus *Solanum* into subgenera, sections and series and his classification is widely accepted today. It is also followed here.

Although the above major works and others attempted to streamline the taxonomy of *Solanum*, the genus is taxonomically difficult, due to various factors. These include the difficulty of associating the names of *Solanum* used by earlier taxonomists with plants of today due to early descriptions being brief, often vague and frequently lacking in characters now considered to be diagnostic. Another problem is that some of the early names, for example many of the names of Linnaeus and those before him, are difficult to typify (Hepper 1979).

Another problem is the occurrence of polyploid series within the section *Solanum* (Edmonds 1977), such as tetraploids and hexaploids occurring within the *S. nigrum* complex. These may provide a barrier to hybridization



FIGURE 1.—Geographical divisions, U1, U2, U3 and U4, of the *Flora of tropical East Africa* and the main towns of Uganda.

between morphologically similar plants leading to cytoraces which are difficult to differentiate using classical methods.

There is also considerable phenotypic plasticity within species and hybridization between closely related species. Hybridization followed by inbreeding may result in formation of new populations different from either parent. This is particularly true for the cultivated species, as for example found in sections *Melongena* and *Oliganthes*. A large number of 'microspecies' or 'semispecies' (Grant 1971) occur in section *Solanum* and it is difficult to decide which of these deserve taxonomic recognition.

In recent years, there has been an explosion of data from various taxonomic research projects aimed at attempting to solve some of the above problems and improving the knowledge of the genus. The majority of these studies has been made outside Africa. Jaeger (1985) recognized 80 species of *Solanum* in Africa. To a large extent we accept the taxonomic treatment of the taxa he discussed. The information in this work, especially on typification and synonymy, was very useful in the present study. No comprehensive taxonomic study had been made on the genus in Uganda. Lind & Tallantire (1975) provided short descriptions of only three Ugandan species of *Solanum*, i.e. *S. terminale* Forssk., *S. incanum* L. and *S. nigrum* L. Sengendo (1982) produced some data on the two species *S. anguivi* and *S. aethiopicum* L., while

Bukenya (1991) gave a comparative account of a few *Solanum* fruit and leaf vegetables.

To date the Solanaceae has not yet been treated for the *Flora of tropical East Africa*. Hence, to identify a species of *Solanum* in Uganda one has to use other regional floras, particularly the *Flora of tropical West Africa*, edn 2 (Heine 1963). However in this Flora, not all the species of *Solanum* occurring in Uganda are included and the descriptions of species are brief.

It was necessary to carry out a comprehensive study of these species so that critical descriptions and a key to the species could be provided.

MATERIALS AND METHODS

The species descriptions were largely based on the study of herbarium material in the Botany Department, Makerere University; the Royal Botanic Gardens, Kew; the Forest Herbarium, Oxford, and the Institute of Systematic Botany, Munich.

Figure 1 shows the map of Uganda divided into the four geographical divisions of the *Flora of tropical East Africa*. Table 1 gives the infrageneric classification of Ugandan *Solanum* species based on D'Arcy (1972).

Key to species

- 1a Plants usually armed:
 - 2a Hairs stellate:
 - 4a Mature leaves $\pm$ glabrous; inflorescence corymbose, cyme subfasciculate or paniculate:
 - 5a Leaves $\pm$ 280×120 mm; inflorescence paniculate 31. *S. giganteum*
 - 5b Leaves $< 200 \times 80$ mm; inflorescence cymose or corymbose:
 - 6a Inflorescence cymose; flowers often subumbellate or branched, peduncle 10–20-flowered; leaves up to 150×70 mm 32. *S. kagehense* group
 - 6b Inflorescence corymbose, 20–50-flowered; leaves $50\text{--}80 \times 30\text{--}40$ mm 33. *S. renschii*
 - 4b Mature leaves mostly hairy; flowers solitary or inflorescence few-flowered, racemose, lateral:
 - 7a Fruit dry, usually completely enclosed by heavily armed accrescent calyx, seeds shiny black 23. *S. coagulans*
 - 7b Fruit not dry, seeds yellow-brown:
 - 8a Corolla 17–45 mm long; fruit $20\text{--}130 \times 30\text{--}100$ mm:
 - 9a Fruit red when mature; prickles absent or present on young leaves 25a. *S. aethiopicum* Gilo group
 - 9b Fruit yellow when mature:
 - 10a Plants 4–10 m high:
 - 11a Leaves about 150×100 mm, upper surface glabrous 19. *S. aculeastrum*
 - 11b Leaves up to 300×240 mm, both surfaces hairy 22. *S. wrightii*
 - 10b Plants < 4 m high:
 - 12a Petiole < 30 mm long; prickles present or absent 21. *S. marocarpum*
 - 12b Petiole 40–70 mm long; prickles present or absent:
 - 13a Prickles almost always absent; fruit $60\text{--}130 \times 30\text{--}100$ mm 18. *S. melongena*
 - 13b Prickles always present; fruit 27×30 mm 20. *S. incanum*
 - 8b Corolla 10–15 mm long; fruit 8×10 mm:
 - 14a Leaves glabrous; corolla 5–7 mm long; fruit ± 15 mm diam. 25b. *S. aethiopicum* Shum group
 - 14b Leaves hairy; corolla > 7 mm long; fruit < 15 mm diam.:
 - 15a Plants clambering or scandent:
 - 16a Inflorescence racemose, 3–10-flowered 27. *S. cyaneo-purpureum*
 - 16b Inflorescence not racemose:
 - 17a Inflorescence umbelliform, 2–6(–10)-flowered; leaves ovate 28. *S. hastifolium*
 - 17b Inflorescence (1) 2–4-flowered; leaves lanceolate 29. *S. taitense*
 - 15b Plants not clambering or scandent:
 - 18a Leaves rather small, $20\text{--}70 \times 10$ mm; fruits yellow when ripe 26. *S. albicaule*
 - 18b Leaves $100\text{--}200 \times 50\text{--}150$ mm; fruits red when ripe:
 - 19a Plants generally non-prickly, occasionally a few prickles present; flowers solitary or 5–15 in a raceme-like cyme 24. *S. anguivi*
 - 19b Plants heavily armed with prickles; inflorescence 8- to many-flowered, rachis simple or branched, racemose 30. *S. usambarense*

- 2b Hairs simple, sometimes glandular or absent, occasionally with stellate hairs interspersed:
 20a Plants climbing; leaves compound; inflorescence many-flowered (50+), inflorescence axis very long, ± 300 mm 17. *S. wendlandii*
 20b Plants not climbing; leaves simple; inflorescence few-flowered (< 10), a short unbranched raceme:
 21a Corolla violet or blue, ± 12 mm long; fruit with terminal nipple or mammilla 15. *S. mammosum*
 21b Corolla white, ± 17 mm wide; fruit with no terminal nipple or mammilla 16. *S. aculeatissimum*
- 1b Plants mostly unarmed:
 3a Hairs stellate; fruits pubescent 14. *S. mauritianum*
 3b Hairs simple, sometimes branched or glandular, or absent; fruits not pubescent:
 22a Leaves compound:
 23a Tuberous stolons present; plant not climbing; inflorescence with simple hairs; fruits ± 7 mm diam. 34. *S. tuberosum*
 23b Tuberous stolons absent; plant climbing; inflorescence glabrous; fruits ± 10 mm diam. 35. *S. seaforthianum*
 22b Leaves not compound:
 24a Plants herbaceous < 2 m high:
 25a Fruiting calyces strongly adherent-acrescent, enclosing at least lower half of berries 4. *S. sarrachoides*
 25b Fruiting calyces only slightly accrescent, reflexed or adhering to base of berries:
 26a Berries longer than broad, yellow, orange or red 5. *S. villosum*
 26b Berries globose or broader than long, black, purple or green:
 27a Inflorescence branched, up to 20-flowered 7. *S. florulentum*
 27b Inflorescence not branched, less than 20-flowered:
 28a Inflorescence racemose 8. *S. tarderemotum*
 28b Inflorescence an umbellate cyme:
 29a Leaves glabrous, up to 250×200 mm 3. *S. scabrum*
 29b Leaves not glabrous, less than 150×100 mm:
 30a Fruiting pedicel erect; seeds 1×1 mm 2. *S. americanum*
 30b Fruiting pedicel recurved:
 31a Corolla about 10 mm diam. 1a. *S. nigrum* subsp. *nigrum*
 31b Corolla about 15 mm diam. 6. *S. grossedentatum*
- 24b Plants shrubs 2–7 m high:
 32a Inflorescence a lax cymose panicle:
 33a Leaves hairy on both surfaces 13. *S. runsoriense*
 33b Leaves more or less glabrous 12. *S. benderianum*
 32b Inflorescence spiciform, umbellate or subracemose:
 34a Erect subshrub; stem verrucose; leaves $20\text{--}70 \times 10\text{--}40$ mm; inflorescence umbellate, 5–10(–20)-flowered 11. *S. nakurense*
 34b Climbing shrubs; stem not verrucose; leaves $80\text{--}170 \times 40\text{--}80$ mm; inflorescence various, (2–7)–50-flowered:
 35a Inflorescence terminal, spiciform, up to 200 mm long 10. *S. welwitschii*
 35b Inflorescence not spiciform:
 36a Inflorescence subracemose, leaf-opposed or in leaf axil, 2–7-flowered 9c. *S. terminale* subsp. *inconstans*
 36b Inflorescence not as above, many-flowered:
 37a Peduncles with terminal umbel, sometimes a few lateral ones as well; inflorescence sometimes with more than 50 flowers 9a. *S. terminale* subsp. *terminale*
 37b Peduncle terminal or subterminal, strongly branched, giving inflorescence a paniculate appearance 9b. *S. terminale* subsp. *sanaganum*

Solanum L., Species plantarum: 184–188 (1753); L.: 85 (1754); D'Arcy: 85 (1973).

Section **Solanum** Seithe in Botanische Jahrbücher 81: 261–336 (1962).

The genus is recognized by the 5-partite calyx and by long, often connivent anthers dehiscing by terminal pores and with short filaments. Other characters useful for recognition are the frequently rotate, 5-lobed corolla, the fruit being a berry with flattened seeds; the often stellate-pubescent prickles; and the often extra-axillary, usually cymose inflorescence.

A. Subgenus **Solanum** D'Arcy in Annals of Missouri Botanical Garden 60: 733 (1973). Type species: *S. nigrum* L.

Leaves subentire or shallowly lobed, often membranaceous; indumentum simple, hairs rarely branching. *Prickles* absent. *Flowers* mostly small. *Corolla* mostly deeply lobed. *Filaments* often pubescent; *anthers* short, dehiscing introrsely by large, often oblique terminal pores and sometimes ultimately by longitudinal slits in the upper portion. *Ovary* glabrous. *Fruit* rather small, 7–15 mm diam.

The subgenus is represented in Uganda by three sections: *Solanum*, *Afrosolanum* and *Benderianum*.

1. **Solanum nigrum** L., Species plantarum: 186 (1753); Heine: 335 (1963); E.M. Lind & Tallantire: 130 (1975); Hepper: 12 (1976). Type: LINN 248.18 (IDC microf. 1775 138: III.4). All the above authors have taken *S. nigrum* in a broad sense.

Herb, about 1 m high. *Leaves* ovate-elliptic, 60–100 $\times$ 40–70 mm; lamina glabrous when mature, margin entire or toothed, repand or with 2 or 3 pairs of short lobes; petiole 10–30 mm long. *Inflorescence* 6–8-flowered; peduncle ± 10 mm long; pedicels ± 5 mm long. *Corolla* 3–4 mm long. *Fruit* usually broadly ovoid, 5–8 mm diam., shiny black when ripe; fruiting pedicel ± 10 mm long, recurved. *Seeds* $\pm 1 \times 2$ mm.

The name *S. nigrum* has been used in Uganda in a broad sense until the work of Edmonds (Gray 1968; Edmonds 1971, 1972) and Jaeger (1985). Edmonds, at Oxford University, identified some of the specimens from the Botany Department herbarium, Makerere. Studies of this complex were carried out with specimens from Uganda, kept at Kew Herbarium and at Makerere Herbarium. Those studies have led to the recognition of eight Ugandan taxa

TABLE 1.—Infrageneric classification of Ugandan *Solanum* spp. based on D'Arcy (1972)

| <i>Solanum</i> spp. | Subgenus | Section |
|-----------------------------|----------------------|-----------------------|
| 1. <i>nigrum</i> | <i>Solanum</i> | <i>Solanum</i> |
| 2. <i>americanum</i> | " | " |
| 3. <i>scabrum</i> | " | " |
| 4. <i>sarrachoides</i> | " | " |
| 5. <i>villosum</i> | " | " |
| 6. <i>grossedentatum</i> | " | " |
| 7. <i>florulentum</i> | " | " |
| 8. <i>tarderemotum</i> | " | " |
| 9. <i>terminale</i> | " | <i>Afrosolanum</i> |
| 10. <i>welwitschii</i> | " | " |
| 11. <i>nakurense</i> | " | " |
| 12. <i>benderianum</i> | " | <i>Benderianum</i> |
| 13. <i>runsoriense</i> | " | " |
| 14. <i>mauritanium</i> | <i>Brevantherum</i> | <i>Brevantherum</i> |
| 15. <i>mammosum</i> | <i>Leptostemonum</i> | <i>Acanthophora</i> |
| 16. <i>aculeatissimum</i> | " | " |
| 17. <i>wendlandii</i> | " | <i>Aculeigerum</i> |
| 18. <i>melongena</i> | " | <i>Melongena</i> |
| 19. <i>aculeastrum</i> | " | " |
| 20. <i>incanum</i> | " | " |
| 21. <i>macrocarpon</i> | " | " |
| 22. <i>wrightii</i> | " | " |
| 23. <i>coagulans</i> | " | <i>Monodolichopus</i> |
| 24. <i>anguivi</i> | " | <i>Oliganthes</i> |
| 25. <i>aethiopicum</i> | " | " |
| 26. <i>albicaule</i> | " | " |
| 27. <i>cyaneo-purpureum</i> | " | " |
| 28. <i>hastifolium</i> | " | " |
| 29. <i>taitense</i> | " | " |
| 30. <i>usambarense</i> | " | " |
| 31. <i>giganteum</i> | " | <i>Torva</i> |
| 32. <i>kagehense</i> group | " | " |
| 33. <i>renschii</i> | " | " |
| 34. <i>tuberosum</i> | <i>Potatoe</i> | <i>Petota</i> |
| 35. <i>seaforthianum</i> | | <i>Jasminosolanum</i> |

from the *S. nigrum* complex. These are *S. nigrum* subsp. *nigrum*, *S. americanum* Mill., *S. scabrum* Mill., *S. sarrachoides* Sendtn., *S. villosum* Mill., *S. grossedentatum* A. Rich., *S. florulentum* Bitter and *S. tarderemotum* Bitter.

1a. ***S. nigrum* L. subsp. *nigrum***; Edmonds: 141–178 (1977).

Herb about 1 m high, with abundant mostly appressed simple hairs when young, subglabrescent when mature. *Stem* robust. *Leaves* usually bearing simple hairs on both surfaces and margin; margin repand or crenate with teeth $\pm$ 3 mm long; petiole 20–35 mm long. *Inflorescence* lateral, lax cymes, 6–8-flowered. *Corolla* $\pm$ 4 mm long. *Fruit* $\pm$ 7 mm diam.; fruit stalk decurved, deep purple to shiny black when ripe. *Seeds* $\pm$ 1 $\times$ 2 mm. 2n = 72 (Edmonds 1977). *Pollen* diam. 25.1–28 μ m.

This subspecies and *S. nigrum* as a whole constitute a Eurasian taxon. It has, however, spread to all other continents. The leaves are eaten in Uganda. Fruits are, however, reported to be poisonous (FAO 1988).

Vouchers: U1: Karamoja, fl. & fr. Jan. 1958, *Beadle* 8. U3: Busoga (0° 15', 33° 54') fl. Sept/ 1973. *Wandera* 10. U4: 0.5 km E of Port Bell Pier, fl. & fr. Jan. 1969, *Lye* 1155.

2. ***Solanum americanum* Mill.** in Gardener's dictionary edn 8: (1768); D'Arcy: 735 (1973); Edmonds: 141–178 (1977). Type: cultivated Chelsea Physic Garden, introduced from Virginia, North America, *Miller s.n.* (BM).

The names *S. nodiflorum* Jacq. and *S. nigrum* L. have been widely and incorrectly used for this species. A detailed list of synonyms has been given by Edmonds (1972, 1979a).

Herb about 1 m high. *Stem* with simple hairs when young, glabrous when mature. *Leaves* 50–130 $\times$ 30–60 mm; mature lamina glabrous, margin repand or with 2–3 pairs of lobes, $\pm$ 5 mm long; petiole up to 50 mm long. *Inflorescence* lateral, umbellate cymes 2–10-flowered; peduncle up to 30 mm long. *Corolla* $\pm$ 3 mm long, up to 10 mm wide. *Fruit* globose, up to 9 $\times$ 10 mm, shiny black when ripe; fruit stalk 10–13 mm long, erect. *Seeds* 1 $\times$ 1 mm. 2n = 24 (Edmonds 1977). *Pollen* diam. 17.7–19.2 μ m.

S. americanum is a morphologically variable species. Edmonds (1977) divided it into two varieties, i.e. var. *americanum* and var. *patulum* (L.) Edmonds. The former is pilose and the latter glabrescent.

S. americanum is an introduced weed. Its leaves are collected and eaten. It occurs in all the four geographical regions of Uganda. It is also widely distributed throughout Africa and around the world. It is of South American origin, probably recently introduced into Africa. It is believed to have donated at least 2 genomes to the hexaploid *S. nigrum* L. (Edmonds 1979b).

Vouchers: U1: Maraca Kijomoro W. Nile, fl. & fr. May 1971. *Batia* 19. U2: Rwenzori Mtn, fl. Aug. 1938, *Purseglove* 308. U3: Nakaloke Mbale, fl. Aug. 1991. *Bukenya* 136. U4: M. 12 Kila-Ebb Rd, fl. & fr. May 1932, *Eggeling* 414.

3. ***Solanum scabrum* Mill.** in Gardener's dictionary edn 8: (1768); Edmonds: 141–178 (1977). Type: cultivated Chelsea Physic Garden, origin North America, *Miller s.n.* (BM) (fide Henderson 1974).

The synonymy has been discussed by Henderson (1974) and Edmonds (1979a).

Bushy subshrub 1.0–1.5 m high. *Stem* with simple hairs when young, glabrous when mature. *Leaves* up to 250 $\times$ 200 mm; lamina glabrous; petiole up to 70 mm long. *Inflorescence* lateral, umbellate to racemose cymes, usually 6–23-flowered, often more; peduncle 20–25 mm long; pedicel $\pm$ 5 mm long. *Corolla* $\pm$ 7 $\times$ 15 mm. *Anthers* purplish brown. *Fruit* broadly ovoid, 13 $\times$ 17 mm, dull purple-black when ripe; fruit stalk erect or recurved 30–40 mm long. *Seeds* 1 $\times$ 1 mm. 2n = 72 (Edmonds 1977).

S. scabrum is a rare species in Uganda and is recorded only from the extreme southwestern part. Its leaves are eaten. In other parts of Africa, the West Indies and Indonesia, it is cultivated for its leaves and young shoots (FAO 1988). The fruits are eaten in Europe, where it is known as 'garden huckleberry'.

Its origin is unknown (Edmonds 1979b). Some authors, however, describe it as a native of Guinea. Heine (1960) has pointed out that *S. scabrum*, 'does not occur wild in Guinea, but is cultivated there as a pot-herb and for medicinal purposes; nor apparently is it a native of any part of Africa'. Morphologically it is distinct and genetically isolated from other hexaploid solanums (Edmonds 1979b).

Vouchers: U2: Kigezi D.F.I., fl. & fr. Aug. 1972, *Goode 3/72*; Bugangiri Ruzhumbura Kigezi, fl. & fr. Feb. 1949, *Purseglove 2712*.

4. ***Solanum sarrachoides* Sendtn.** in Martius, *Flora braziliensis* 10: 18 (1846). Types: Brazil, *Sellow s.n.* (B†; P, lecto.) (fide Edmonds 1972, 1986). The typification of this species is discussed by Edmonds (1986).

The synonymy is discussed by Edmonds (1972, 1986).

Erect and spreading herb up to 750 mm high with dense glandular hairs. *Leaves* ovate, sinuate dentate, 30–70 mm × 15–40 mm. *Cymes* simple, shortly racemose, 3–8-flowered. *Flowers* up to 10 mm diam. *Fruiting pedicels* reflexed; fruiting calyces strongly adherent, accrescent, enclosing at least the lower half of the fruit. *Fruit* green to brownish purple when mature, less than 9 mm diam. $2n = 24$ (Edmonds 1972).

S. sarrachoides is a relatively rare species in Uganda. It is not edible. It is originally from South America but now established across tropical Africa and naturalized in Europe.

Edmonds (1979b) suggested that this species might be a diploid progenitor of the tetraploid *S. villosum* Mill. and therefore may have played a role in the origin of *S. nigrum* L. It is morphogenetically completely isolated from all other diploid solanums (Edmonds 1977).

Vouchers: U2: nr footbridge, Nyabitaba Rwenzori, fl. Jan. 1969, *Lye 1365*; Kigezi D.F.I., fl. & fr. Aug. 1972, *Goode 5/72*. U3: N.E. Elgon, fl. & fr. Nov. 1951, *Tweedie 1068*.

5. ***Solanum villosum* Mill.** in Gardener's dictionary edn 8: (1768). Type: cultivated Chelsea Physic Garden, introduced from Barbados. *Miller s.n.* (BM). [Lectotype fide Edmonds 1979a; neotype fide Henderson (1977)].

Erect herb, sometimes woody, much branched, up to 0.9 m high, glabrescent to villose, with glandular or eglandular hairs. *Leaves* ovate, entire or dentate 30–100 × 15–40 mm. *Inflorescence* simple, 3–9-flowered; flowers 10–17 mm diam. *Fruiting pedicels* usually deflexed. *Fruit* longer than broad, 6–10 mm diam., yellow, orange or red. $2n = 48$ (Edmonds 1977).

Edmonds (1977, 1984) subdivided *S. villosum* into two subspecies: subsp. *villosum* and subsp. *miniatum* (Bernh. ex Willd.) Edmonds. The former has dense, mostly patent glandular hairs whereas the latter has few to many appressed eglandular hairs. *S. villosum* is believed to have hybridized with *S. americanum* and given rise to a sterile triploid which through chromosome doubling gave rise to *S. nigrum* (Edmonds 1979b). The origin of *S. villosum* is not clear. Stebbins (1950) speculated that *S. americanum* might have played a role in its origin. Edmonds (1979b)

suggested the possibility of *S. sarrachoides* being the second parent of *S. villosum*.

S. villosum is native to Europe. It has become established in Africa. In Uganda it occurs in three of the four geographical regions. Its leaves are eaten as spinach.

Vouchers: U1: Moroto Mtn, fl. & fr. Jan. 1959, *Wilson 633*; Kidepo N.P. Dodoth, fr. Jan. 1973, *Synnot 1404*. U2: Ruizi R., fl. & fr. Apr. 1951, *Jarrett 454*. U3: Bujagali Falls, Jinja, fl. & fr. July 1952, *Lind 82*.

6. ***Solanum grossedentatum* A. Rich.**, Tentamen florae abyssinicae 2: 101 (1850). Type: Ethiopia, 'crescit in provincia Tchelikote', A. *Petit s.n.* (P).

Semiprocumbent herb up to 700 mm high, villose with rust-coloured hairs. *Leaves* ovate, dentate to incised, 30–70 × 20–40 mm. *Cymes* simple, subumbellate, 3–4-flowered, pedicels reflexed. *Corolla* about 15 mm diam. *Fruiting pedicels* reflexed. Ripe fruit black.

S. grossedentatum seems to be native to Africa. Its ploidy level is unknown.

In Uganda it is fairly widely distributed, occurring in three of the geographical regions. It is a crop weed. The leaves are used as a vegetable and the fruits eaten by children.

Vouchers: U1: Paidia W. Nile, fl. & fr. Aug. 1953, *Chancellor 185*. U2: Muhokya Rwenzori, fl. Dec. 1925, *Maitland 1290*. U3: Budadiri Bugishu, fl. & fr. Jan. 1932, *Chandler 405*.

7. ***Solanum florulentum* Bitter** in Feddes Repertorium 10: 544 (1912). Type: Tanzania, *Albers 189* (B†, EA?).

Scrambling herb, up to 1.5 m high, sparsely pubescent with simple hairs. *Leaves* ovate to lanceolate up to 100 × 60 mm, petiole up to 20 mm long. *Inflorescence* branched once, racemose, 8–20-flowered; inflorescence stalk ± 17 mm long; pedicels ± 8 mm long. *Corolla* 6–10 mm wide, lobes ± 3 mm long. *Fruit stalk* reflexed, ± 10 mm long. *Fruit* globose, 6 × 6 mm, purple to black when ripe. Ploidy level unknown.

S. florulentum is fairly common in geographical regions U2 and U4 of Uganda and it seems to be native to East Africa. Its leaves are eaten. It has been confused with *S. nodiflorum* Jacq. and *S. nigrum* L. *sensu lato*.

Vouchers: U2: Kigezi D.F.I., fl. & fr. Aug. 1972, *Goode 2/72*. U4: Kituza, 35 ml SE of Kila, fl. & fr. June 1957, *Griffiths 47*.

8. ***Solanum tanderemotum* Bitter** in Feddes Repertorium 10: 547 (1912). Type: Tanzania *Winkler 3856* (WRSL?).

Erect or scrambling herb, up to 2.5 m high, glabrous or sparsely pubescent with simple hairs. *Leaves* ovate to lanceolate, entire or sinuate-dentate, 70–180 × 35–70 mm. *Inflorescence* simple, racemose, 7–12-flowered. *Flowers* 7–9 mm diam. *Fruiting pedicels* reflexed. *Fruit* greenish yellow or purple when ripe, 4–6 mm diam. Ploidy level unknown.

S. tanderemotum is closely related to *S. florulentum* but differentiated from it by its simple inflorescence. It also seems to be native to East Africa. In Uganda it is represented in all the geographical regions. Its leaves are eaten.

Vouchers: U1: Terego W. Nile, fl. & fr. Apr. 1938, *Hazel* 486. U2: Kigezi D.F.I., fl. & fr. Aug. 1972, *Goode* 172. U3: Budadiri Bugishu, fl. & fr. Jan. 1932, *Chandler* 458. U4: Nakyesanja nr Kawanda, fl. & fr. Mar. 1972, *Damulira* 35.

Section **Afrosolanum** Bitter in Botanische Jahrbücher 54: 440–487 (1917); D'Arcy: 266, 274 (1972). Type species: *S. terminale* Forssk.

This is a rather difficult section, complicated by species plasticity and the existence of numerous specific and infraspecific names. Heine (1960) adopted a broad view of the species. He considered all material in this section from the FWTa (Heine 1963) area to be *S. terminale*. This was split into three subspecies: *inconstans*, *sanaganum* and *welwitschii*. Jaeger (1985) recommended three species for this section: *S. nakurense*, *S. terminale* and *S. welwitschii*. The subspecies of *S. terminale* are not very clear cut.

9. ***Solanum terminale* Forssk.**, Flora aegyptiaco-arabica: 45 (1775); Bitter: 301 (1922); Heine: 247 (1960). Type: Yemen, Mokhaja, *Forsskål s.n.* (C, IDC microf. 2200 102: II.3–6).

9a. ***Solanum terminale* Forssk. subsp. terminale** Heine in Kew Bulletin 14: 247 (1960).

The synonymy is discussed by Heine (1960, 1963) and Jaeger (1985).

Liana about 4 m tall. *Leaves* up to 110 × 65 mm, petiole up to 80 mm long. *Inflorescence* very many-flowered, often > 50 flowers; pedicels to ± 10 mm long; peduncles with terminal umbel, occasionally also with a few lateral umbels; lateral umbels subsessile or occasionally with the lowest on short branches. *Corolla* ± 8 mm long, whitish purple or bluish purple. *Fruit* globose, ± 8 mm diam., red when ripe.

Subsp. *terminale* is quite widely distributed in Uganda and eastern Africa from Ethiopia to South Africa.

Vouchers: U2: Kigezi, fl. Feb. 1956, *M.C.* 909; Kalinzu Forest, Igara, fr. June 1970, *Katende* 352. U3: Bunya, Busoga, fl. Nov. 1937, *Webb* 62. U4: 2 km E of Bujoko-Mubende Rd, fl. Feb. 1969, *Lye* 1950.

9b. ***Solanum terminale* subsp. sanaganum** (Bitter) Heine in Kew Bulletin 14: 248 (1960). Type: Cameroon, nr Deng Deng, *Mildbraed* 8619 (K!).

For synonymy see Heine (1960, 1963) and Jaeger (1985).

Climber about 6 m high. *Leaves* about 90 × 40 mm; petiole about 40 mm long. *Inflorescence* many(–50)-flowered; peduncles terminal or subterminal, strongly branched giving the inflorescence a panicle appearance; pedicels ± 10 mm long. *Corolla* ± 8 mm long,

whitish purple. *Fruit* globose or slightly longer than wide, 8 × 6 mm.

Subsp. *sanaganum* is quite close to subsp. *terminale* in both vegetative and floral characters. The main difference between them is that the former has a panicle, the latter an umbellate type of inflorescence. In Uganda it is less common than subsp. *terminale* but it is widely distributed in upland forests of tropical Africa.

Vouchers: U2: Echuya F.R. Kigezi, fl. Apr. 1970, *Katende* 221. U4: Entebbe, fl. & fr., *Brown* 14; Mabira Forest, fl. Feb. 1972, *Katende* 1526.

9c. ***Solanum terminale* subsp. inconstans** (C.H. Wright) Heine in Kew Bulletin 14: 247 (1960); Heine: 331 (1963); Gbile: 118 (1979). Syntypes: Fernando Po, *Mann* 62 (K); Cameroons, *Kalibreyer* 172 (K).

For synonymy see Heine (1960).

Slender woody climber. *Stem* flexuose with long internodes. *Leaves* up to 100 × 50 mm; petiole up to 18 mm long. *Inflorescence* subracemose, leaf opposed or in leaf axil; few (2–7)-flowered; peduncle up to 35 mm long; pedicel ± 14 mm long. *Corolla* 8–10 mm long. *Fruit* spindle-shaped, ± 25 × 10 mm; fruit stalk ± 28 mm long.

Subsp. *inconstans* is rare, found in disturbed forest. In Uganda it has been collected from Mabira Forest.

Vouchers: U4: Mabira Forest, fl. Sept. 1938, *Loveridge* 75.

10. ***Solanum welwitschii* C.H. Wright** in Kew Bulletin 1894: 126 (1894). Syntypes: Angola, *Welwitsch* 6081, 6098 (K!).

A list of synonyms is provided by Jaeger (1985).

Slender woody climber. *Leaves* elliptic, up to 170 × 80 mm; petiole up to 120 mm long. *Inflorescence* terminal, spiciform, up to 200 mm long; flowers > 50, bluish purple, in cymes, subsessile on axis. *Corolla* 8–10 mm long. *Fruit* globose, to 10 mm diam., red when ripe; fruit stalk to 6 mm long.

S. welwitschii is found in the forests of western and central Uganda. It also occurs in secondary forests of western tropical Africa.

Vouchers: U2: Siba Forest Kinkizi, fl. & fr. May 1951, *Dawkins* 751. U4: Mabira Forest, fl. Sept. 1933, *Bransnett* s.n.

11. ***Solanum nakurense* C.H. Wright** in Kew Bulletin: 275 (1897). Type: Kenya, Nakuru, *Scott Elliott* 6800 (K!).

For synonymy see Jaeger (1985).

Erect subshrub to 2 m high. *Stem* verrucose. *Leaves* variable, 20–70 × 10–40 mm, ovate, with scattered simple hairs on upper surface; lower surface sparse to densely hairy. *Inflorescence* umbellate; peduncle rarely branched, 5–10(–20)-flowered. *Flowers* white, orange to violet; corolla 6–10 mm long, to 15 mm diam.; pedicel to 12

mm long, strongly reflexed at anthesis. *Fruit* red, globose, 8 mm diam.

S. nakurense is morphologically similar to *S. terminale*. It differs from the latter by being erect, and having smaller leaves which are more hairy than in *S. terminale*. Its inflorescence is also generally simpler than in *S. terminale*.

S. nakurense is relatively rare in Uganda. It generally prefers the upland woodlands and open habitats.

Vouchers: U2: Kanaba gap Kabale-Kisoro, fl. Oct. 1960, *Miller 448*, U3: Namasindwa, Mt Elgon, fl. May 1924, *Snowden 889/a*; nr Kapkwata Forest St. Sebei, fl. Jan. 1969, *Lye 1571*.

Section **Benderianum** *Bitter* in *Botanische Jahrbücher* 54: 487–489 (1917). Type species: *S. benderianum* Schimp. ex Dammer.

12. ***Solanum benderianum*** Schimp. ex Dammer in *Botanische Jahrbücher* 38: 184 (1906). Syntypes: Ethiopia, near Gaffat, *Schimper 1227* (1863) (E); Uganda, Rwenzori Mts, *Scott Elliott 7733* (K!).

Climbing shrub. *Leaves* lanceolate, $\pm$ glabrous. *Inflorescence* terminal, a lax cymose panicle with > 50 flowers. *Corolla* violet, $\pm$ 20 mm diam.

The more or less glabrous *S. benderianum* is closely related to the hairy *S. runsoriense*. It is very rare in Uganda, only recorded from the Rwenzori Mts. It is common in Ethiopia, growing at an altitude of 2 500–3 600 m. *S. macrothyrsus* Dammer from the Comoro Islands is probably synonymous with *S. benderianum* (Jaeger 1985).

Voucher: U2: Rwenzori, fl. & fr. 1916, *Fyffe 20*.

13. ***Solanum runsoriense*** C.H. Wright in Johnston, *Uganda Protectorate* 1: 362 (1902). Type: Uganda, Rwenzori Mts, *Doggett s.n.* (K!).

Climbing shrub to 4 m high, with dense mealy pubescence of much branched hairs. *Leaves* lanceolate upper surface with light cover of mostly simple hairs; lower surface with a heavy cover of branched hairs. *Inflorescence* terminal, a lax cymose panicle with $\pm$ 50 or more flowers. *Corolla* light blue to purple, $\pm$ 20 mm diam.; *filaments* sometimes 3 mm long, *anthers* slightly longer, dehiscing by terminal pores and longitudinal slits running downwards from the pore.

S. runsoriense is a montane forest species occurring in Uganda on Rwenzori Mtn in the west and Mt Elgon in the east at or above the bamboo zone. It also occurs in Kenya at an altitude of 2 500–3 000 m.

Jaeger (1985) suggested that *S. longipedicellatum* De Wild., *S. dewildemanianum* Robyns and *S. keniense* Standl. are probably later synonyms of *S. runsoriense*.

Vouchers: U2: Mubuku Valley, Rwenzori, fl. July 1938, *Eggeling 3792*. U3: above bamboo zone Elgon, fl. Apr. 1930, *Liebenberg 1637*.

B. Subgenus **Brevantherum** (*Seithe*) *D'Arcy* in *Annals of Missouri Botanical Garden* 59: 267–274 (1972); *D'Arcy*: 713 (1983). Type species: *S. erianthum* D. Don.

Plants unarmed. Hairs branched or stellate. *Leaves* mostly entire or nearly so. *Anthers* stout, opening by large terminal pores and sometimes ultimately by longitudinal slits. *Ovary* glabrous to tomentose. *Fruit* rather small, 7–20 mm diam. The subgenus is represented in Uganda by one section: *Brevantherum*.

Section **Brevantherum** *Seithe* in *Botanische Jahrbücher* 81: 297 (1962). Type species: *S. erianthum* D. Don.

14. ***Solanum mauritianum*** Scop., *Deliciae florae et faunae insubricae* 3: 16 t. 8 (1788). Type: Scop.: t. 8 (1788) (fide Roe 1972).

For synonymy see Heine (1963).

Shrub or small tree 4–7 m high, unarmed, young stem densely covered with sessile stellate hairs, stem with axillary subactive buds bearing small leaves. *Leaves* elliptic-ovate, entire, up to 250 $\times$ 100 mm, apices acute, bases attenuate; both surfaces of leaves densely covered with stellate hairs; petiole to 70 mm long. *Inflorescence* terminal, paniculate, many(> 50)-flowered. *Flowers* purple; pedicels $\pm$ 5 mm long. *Corolla* 15 mm diam., lobes 5 mm long. *Anthers* differing slightly in length, i.e. 1 short ($\pm$ 1.8 mm), 2 or 3 medium (2 mm) and 2 longest (2.4 mm). *Fruit* spherical, pubescent, green when young, yellow when mature, 12 $\times$ 11 mm; stalk $\pm$ 5 mm long. *Seeds* 2 $\times$ 2 mm. $2n = 24$ (*D'Arcy* 1974).

S. mauritianum is a widespread weed in Uganda and other parts of tropical Africa. The closely related species *S. erianthum* D. Don. and *S. umbellatum* Mill., established elsewhere in Africa (Bukenyi & Hall 1988), have not yet been recorded for Uganda.

S. mauritianum, *S. erianthum* and *S. umbellatum* are native to the Americas. Their spread to Africa has been associated with the 16th century Spanish and Portuguese trade routes (Roe 1979). These species are colonizers of open ground: forest openings, stream borders and areas of human disturbance such as roadsides.

Reproduction in these plants is not only by seed, but apparently more commonly by adventitious roots from shallow roots to form large colonies. They are self-compatible, another characteristic of successful weeds. The colourful berries and frequently isolated plants suggest bird dispersal of seed (Roe 1979).

S. mauritianum has been widely known in the past as *S. auriculatum* Aiton but the publication of *S. mauritianum* antedates this name by one year.

Voucher: U4: Nakiyaga Masaka, fl. & fr. Sept. 1989, *Bukenyi 49*.

C. Subgenus **Leptostemonum** (*Dunal*) *Bitter* in *Botanische Jahrbücher* 55: 69–89 (1919); *D'Arcy*: 684 (1973); *Whalen*: 179–282 (1984). Lectotype: *S. mammosum* L. (fide *D'Arcy* 1972).

Indumentum often stellate, prickles usually present. *Anthems* mostly slender, tapering to the tip and opening by small terminal pores or, if stout, narrowing abruptly to a small tip and also often opening by longitudinal slits near base, dehiscing introrsely or extrorsely by outward bending of the tips. *Ovary* glabrous. *Fruit* often large (7–)10–80(–90–130 mm).

This subgenus is the largest in Uganda, represented by six sections: *Leptostemonum* (*Acanthophora*), *Aculeigerum*, *Melongena*, *Monodolichopus*, *Oliganthes* and *Torva*.

Section ***Acanthophora*** Dunal, Histoire Naturelle, Médicale et Économique des *Solanum*: 131, 132 (1813); D'Arcy: 909 (1973). Type species: *S. mammosum* L. (fide D'Arcy 1972).

15. ***Solanum mammosum* L.**, Species plantarum: 187 (1753); D'Arcy: 712 (1973); Nee: 576 (1979). Lectotype: Pluk.: t. 226, fig. 1 (1696). (Typotype: Herb. Sloane Vol. 98 fol. 59 (BM). For reasons for type selection see Jaeger (1985).

A list of synonyms is given by Whalen (1984).

Shrub about 1.5 m high. *Stems* densely covered with simple hairs ± 2 mm long, and slightly decurved prickles that are 5 mm long with base 2 mm broad. *Leaves* $\pm 110 \times 90$ mm, lobed or doubly lobed to about $\frac{1}{2}$ width of leaf; lobes triangular; prickles on midrib straight, ± 17 mm long, base ± 1 mm broad, on primary lateral veins 3–8 mm long, hairs on upper surface mainly simple, on lower surface stellate mixed with simple hairs; petiole up to 70 mm long with simple hairs and straight prickles ± 13 mm long, base 1 mm broad. *Inflorescence* 3–4-flowered; pedicel ± 7 mm long. *Corolla* violet or blue, ± 12 mm long. *Fruit* up to 50 mm wide, bearing a terminal nipple or mamilla, 5 mamillae or protuberances often present at base. *Seeds* brown. $2n = 22, 24$ (Heiser 1971).

S. mammosum is an introduced ornamental which is rarely found in Uganda, being native to the Caribbean region of central America where it is found in disturbed habitats and where it is cultivated for its curious fruits which are used as a medicine and as a cockroach poison (Duke 1970).

Vouchers: U3: Serere, Teso, fr. Dec. 1931, Chandler 203. U4: Makerere Univ., fl. & fr. Feb. 1992, Bukunya 143 (seed from Nakasero nr Kampala).

16. ***Solanum aculeatissimum* Jacq.**, Icones plantarum rariorum 1: 5, t. 41 (1781); C.H. Wright: 228 (1906); Bitter: 148 (1923); Dalziel: 432 (1937); Heine: 535 (1963); Gbile: 115 (1979). Type: cultivated plant at Vienna, *Jacquin s.n.* (W).

For synonymy see Whalen (1984).

Shrub ± 1.5 m high, densely pubescent with simple hairs 0.1–1.0 mm long, decurved prickles up to 12 mm long with base 0.5 mm broad. *Leaves* $\pm 180 \times 160$ mm, lobed or doubly lobed to $\frac{1}{3}$ width of leaf, with 3–4 pairs of major triangular lobes; middle lobe up to 55 mm long;

simple pilose hairs on both surfaces or leaves, rare stellate hairs on underside; prickles on midrib and petiole slender, ± 15 mm long, base 0.8 mm broad, purple near base, upper part yellow; petiole 4–80 mm long. *Inflorescence* 3–6-flowered. *Corolla* white, $\pm 17 \times 30$ mm, peduncle 0.5 mm long; pedicel ± 11 mm long. *Fruit* globose, ± 35 mm diam. *Seeds* 3×4 mm, brownish.

S. aculeatissimum generally grows in forest clearings. It is widely distributed throughout Africa. It also occurs in southeastern Brazil (Whalen 1984). It is likely to have been introduced to Africa several hundred years ago (Jaeger 1985).

Vouchers: U1: Kidepo N.P., fl. & fr. Sept. 1972, Synnot 1269. U2: Kizimba Bundibugyo, fl. Sept. 1991, Bukunya 146. U4: Entebbe Region, Mar. 1921, Kew Herb. sheet No. 681.

Section ***Aculeigerum*** Seithe in Botanische Jahrbücher 81: 291, 292 (1962). Type species: *S. wendlandii* Hook.

17. ***Solanum wendlandii* Hook.** in Curtis's Botanical Magazine 113: t. 6914 (1887). Type: cultivated at Kew from Costa Rican seed (K!).

Woody climber, armed with small recurved prickles on stem and midribs of leaves. *Leaves* up to 150×120 mm, broadly elliptic, compound; at base, leaflets separate, towards apex lamina only deeply divided. *Inflorescence* many (50+)–flowered. *Inflorescence* axis very long, ± 300 mm. *Flowers* purple; pedicel 20 mm long. *Calyx* 3 mm long. *Corolla* 50 mm wide. *Stamens* of different filament lengths: 5 mm (1), 3 mm (2) and 2 mm (2); anther tips purple, lower part yellow. $2n = 24$ (Federov 1969; Whalen 1984).

S. wendlandii is widely cultivated in the tropics as an ornamental for its showy flowers. It flowers regularly but the senior author has never seen it fruiting. It is probably a native of Costa Rica (Whalen 1984).

Vouchers: U4: M1 2 Gayaza Rd, fl. Aug. 1990, Bukunya 53; Buganda Road P.S., fl. Apr. 1990, Bukunya 44; Masaka City, fl. May 1952, Lye 6840.

Section ***Melongena*** Dunal, Histoire Naturelle, Médicinale et Économique des *Solanum*: 208–218 (1813); D'Arcy: 698 (1972). Type species: *S. melongena* L. (fide D'Arcy 1972).

18. ***Solanum melongena* L.**, Species plantarum: 186 (1753); Wright: 242 (1906); Bitter: 292 (1923); Heine: 322 (1963); D'Arcy: 704 (1973); Hepper: 122 (1976); Khan: 630 (1979). Type: lectotypified by D'Arcy (1974) with LINN 248.28 (IDC microf. 139: II.2).

A list of synonyms is given by Heine (1963) and Whalen (1984).

Shrub ± 1.5 m high. *Stem* with stellate hairs of 8–10 unequal arms. *Leaves* $\pm 150 \times 100$ mm, bearing on both surfaces short, stalked, stellate hairs, margin with 2–3 pairs of lobes up to 30 mm long; petiole about 40 mm

long. *Flowers* usually solitary or inflorescence 2–3-flowered; pedicel ± 25 mm long. *Corolla* 20–22 mm long, purple, petal tips apiculate, incurved. *Calyx* about 10 mm long, normally not prickly but prickles 2–3 mm long may occur. *Fruit* ovoid or globose, 60–130 $\times$ 30–100 mm, green, with white patches, white or purple when young, orange-yellow to brownish when ripe; fruit stalk 20–80 mm long, decurved. *Seeds* 3 $\times$ 4 mm. $2n = 24$, but tetraploid forms occur (Whalen 1984).

S. melongena is an important commercial fruit/vegetable in Uganda. The species is believed to have originated in Asia (Indo-Burma) and is now cultivated on all continents for its edible fruits. *S. melongena* is believed to have evolved from *S. incanum sensu lato* which migrated into Asia from northeastern Africa and the Middle East (Lester & Hasan 1991).

Vouchers: U2: Kyembogo D.F.I., fl. & fr. Oct. 1990, *Bukenya* 108. U3: Kyabirwa, Budondo-Jinja, fl. Aug. 1991, *Bukenya* 130. U4: Bukanaga, Mityana, fl. & fr. Aug. 1990, *Bukenya* 71.

19. ***Solanum aculeastrum* Dunal** in A.P. de Candolle, *Prodromus systematis naturalis regni vegetabilis* 13,1: 366 (1852). Type: South Africa, Cape Province, Morley, Drège (Vb, as *S. sodomium*) (G-DC, IDC microf. 2091: III.4).

For synonymy see Heine (1963), Whalen (1984) and Jaeger (1985).

Shrub to small tree up to 7 m high. *Leaves* with deep lobes about 30 mm long, upper surface glabrous, lower with a heavy cushion of stellate hairs; petiole short, about 20 mm long. *Inflorescence* few- to 10-flowered, only 1 or 2 flowers functionally female. *Flowers* white, ± 25 mm diam., lobes ± 10 mm long; pedicel ± 15 mm long. *Anthers* $\pm$ of equal length. *Fruit* warted, yellow when ripe, 40 $\times$ 42 mm; stalk slightly decurved, about 30 mm long. *Seeds* 4 $\times$ 3 mm. $2n = 24$ (Whalen 1984).

S. aculeastrum is a native African species extending eastwards from Imatong Mts in Sudan to the Cape in South Africa and westwards from Cameroon highlands. It is rather variable. Jaeger (1985) divided it into 4 subspecies (subsp. 1; subsp. 2; subsp. *aculeastrum* and subsp. *thomsonii*). It has many traditional uses (Bukenya 1993).

Vouchers: U2: Mushungyero, Bufumbira, fl. & fr. 1970, *Katende* 153. U3: Buwenda-Busoga, fl. July 1945, *Wakabi* 41; Iganga Town, fl. & fr. Aug. 1991, *Bukenya* 135. U4: Wattuba nr Kiboga, fl. & fr. Aug. 1970, *Katende* 498.

20. ***Solanum incanum* L.**, *Species plantarum*: 188 (1753); C.H. Wright: 238 (1906); Bitter: 200 (1923); Dalziel: 433 (1937); Heine: 332 (1963); Gbile: 118 (1979). All the above authors have taken *S. incanum* in a broad sense.

The typification of *S. incanum* L. is discussed in a paper by Hepper & Jaeger (1985), who selected a neotype (Herb. J. Burser vol. 9 No. 20 UPS IDC microf. series No. 1064 51: I.4).

An extensive list of synonyms is provided by Heine (1963), Whalen (1984) and Jaeger (1985).

Shrub 1.0–3.0 m high; stem with stellate floccose hairs with 8–10 more or less equal arms; prickles ± 5 mm long with base ± 2 mm broad. *Leaves* $\pm 240 \times 120$ mm; margin sinuate or with 3 pairs of short lobes; middle lobe up to 20 mm long; both surfaces with stellate hairs; prickles on midrib ± 3 mm long with base ± 0.5 mm broad; petiole up to 70 mm long. *Inflorescence* up to 10-flowered; 1–5 flowers functionally female; pedicel ± 10 mm long. *Corolla* violet, $\pm 30 \times 27$ mm. *Calyx*, especially on the lowermost flower, very prickly, prickles ± 2 mm long. *Fruits* globose, 30 $\times$ ± 27 mm, green with light green patches when young, yellow when ripe.

S. incanum sensu lato is extremely common in Uganda, occurring in all the geographical regions and different habitats. It is polymorphic, and its intraspecific variation requires a thorough study, especially experimental work.

Jaeger (1985) treated *S. incanum* in Africa as a species aggregate and divided it into five groups. These include *S. incanum* group which occurs in the dry country scrub of NE Africa and the middle East; *S. lichtensteinii* group which is found in wooded grasslands of southern Africa; *S. panduriforme* group which occurs in eastern southern Africa; *S. campylacanthum* group, a common shrub of disturbed ground in the grasslands of central, East and southern Africa and *S. cerasiferum* group which occurs in NE Africa extending to northern Nigeria. Lester & Hasan (1991) divided *S. incanum sensu lato* into four groups: Group A, including *S. lojeru* Dunal, *S. campylacanthum* Dunal, *S. delagoense* Dunal and many other species recognised by Bitter (1923); Group B containing *S. panduriforme* Dunal only and has the narrowest leaves of all the species; Group C being *S. incanum* L. *sensu stricto* (Hepper & Jaeger 1985); and Group D containing *S. lichtensteinii* Willd. and allied taxa.

The Ugandan material of *S. incanum sensu lato* possibly belongs to Jaeger's *S. panduriforme* group (Lester & Hasan's Group B and Jaeger's *S. campylacanthum* group (Lester & Hasan's Group A).

Vouchers: U1: Amolotar Lango, fl. Sept. 1946, *Dawkins* 218. U2: 5 km NE of Nyarushanje, fl. & fr. Dec. 1968, *Lye* 1082. U3: Serere, fl. Sept. 1970, *Edaru* 2. U4: Mulago, fl. Sept. 1967, *Mweheire* 20; Kasa Forest nr L. Wamala, fl. Nov. 1949, *Dawkins* 454.

21. ***Solanum macrocarpon* L.**, *Mantissa altera*: 205 (1771); C.H. Wright: 214 (1906); Bitter: 195 (1923); Burkill: 333 (1925); Dalziel: 343 (1937); Heine: 234 (1963). Lectotype: Sheet 248.11 in LINN (IDC microf. 138: II.3). The selection of this lectotype is discussed by Jaeger (1985).

The synonymy is discussed by Burkill (1925), Heine (1963), Whalen (1984), Jaeger (1985) and Bukenya (1993).

Subshrub or shrub, 0.5–1.5 m high. *Stem* terete, glabrous or with stellate hairs; not prickly or with prickles ± 6 mm long. *Leaves* 150–460 $\times$ 80–300 mm, entire or with short lobes, ± 10 mm long to deeply doubly lobed

with major lobes up to 80 mm long; young leaves bear on upper surface simple, or stellate hairs, either singly or in combination; lower surface with stalked stellate or more or less sessile stellate hairs; mature leaves glabrous or with simple hairs and stellate hairs; prickles present or absent on leaves, when present, principally on midrib and lateral veins; petiole very short to 70 mm long. *Inflorescence* lateral, racemose, 3–12-flowered. *Flowers*: lowermost flower or flowers hermaphrodite, larger than the rest and functionally female, distal flowers with short styles, functionally male. Normally 1–2(–5) hermaphrodite plus 1–4 functionally male flowers present. *Corolla* infundibuliform-rotate or campanulate, 20–35 mm long, white, light purplish or blue. *Calyx* not prickly or with prickles $\pm$ 10 mm long; fruiting calyx often accrescent, 15–50 mm long. *Ovary* glabrous or with short-stalked or sessile glandular hairs. *Fruit* depressed globose, 20–60 $\times$ 30–100 mm, green, ivory or purplish white with dark stripes; when ripe, yellow to brownish; stalk erect or decurved, 10–40 mm long. *Seeds* 3.0–4.5 $\times$ 2.0–3.6 mm. $2n = 24$.

The *S. macrocarpon* complex is extremely variable. In this treatment the complex is taken as a combination of *S. macrocarpon* L. and *S. dasyphyllum* Schum. & Thonn. This is because Bukenya (1993) obtained fully fertile F1 and F2 hybrids (pollen stainability was 80–100%) between what was previously known as *S. macrocarpon* and *S. dasyphyllum*. All accessions of these taxa and of hybrids between them showed 12 bivalents at metaphase-I of meiosis and regular disjunction indicating that they belong to the same biological species. Bukenya (1993) split the complex in Uganda into four major groups: two are cultivars, one is a semi-wild and the fourth is the wild group (formerly called *S. dasyphyllum*).

Seme (1983), Bista (1983) and Jaeger (1985) were also of the opinion that the separation of *S. macrocarpon* and *S. dasyphyllum* is no longer justifiable. The *S. macrocarpon* complex is closely related to *S. sessilistellatum* Bitter which is endemic to Kenya, but distantly related to the *S. incanum* group (Whalen 1984).

The *S. macrocarpon* complex is native to Africa from where cultivars were introduced to other parts of the world. In Uganda, the complex, especially the wild group, is widely distributed.

S. macrocarpon (cultivated group)

Vouchers: U3: Nkoma Bujoloto, fl. Aug. 1991, *Bukenya* 138. U4: Nabingo, fl. & fr. Sept. 1990, *Bukenya* 80.

S. macrocarpon (semi-wild group)

Vouchers: U3: Budondo Jinja, fl. Aug. 1991, *Bukenya* 131. U4: Nabingo, fl. & fr. Oct. 1990, *Bukenya* 83.

S. macrocarpon (wild group)

Vouchers: U1: Napak Karamoja, fl. & fr. July 1948, *Philip* 203. U2: Mile 8 Kingumya Bwamba, fl. & fr. Sept. 1991, *Bukenya* 148. U4: Kivuuvu-Mityana, fl. & fr. Aug. 1990, *Bukenya* 61, 62.

22. *Solanum wrightii* Benth. in *Flora hongkongensis*: 243 (1861); Bitter: 180 (1923); Heine: 248 (1960);

Irvine: 733 (1961); Heine: 335 (1963); Gbile: 119 (1979). Type: Hong Kong, *C. Wright* 489 (K!).

For synonyms see Heine (1960, 1963) and Jaeger (1985).

Small tree up to 10 m high. *Stem* bearing prickles, and stellate hairs on setae $\pm$ 1 mm long. *Leaves* $\pm$ 300 $\times$ 240 mm, with 2–3 pairs of prominent lobes up to 90 mm long, upper surface bearing simple hairs $\pm$ 1 mm long, lower surface with stellate hairs with 5–8 unequal arms on setae $\pm$ 0.5 mm long; prickles on midrib 10–20 mm long, base 4 mm broad; petiole $\pm$ 100 mm long; prickles on petiole up to 20 mm long with base 6 mm broad. *Inflorescence* > 20-flowered. *Corolla* blue to violet, turning white with age, up to 45 $\times$ 80 mm. *Calyx* $\pm$ 20 mm long; pedicel $\pm$ 25 mm long. *Anthers* of different length (2 $\pm$ 20 mm long, 2 medium, 1 short). *Fruit* globose, green when young with light green patches, yellow when ripe, 50 $\times$ 55 mm; fruiting calyx about 20 mm long.

S. wrightii is an introduced decorative tree which is a native of Bolivia. It has been introduced to other tropical areas of the world.

Vouchers: U2: Kyembogo D.F.I., fl. & fr. Oct. 1990, *Bukenya* 107. U3: Jinja town, fl. Aug. 1991, *Bukenya* 125. U4: Mityana S.S., fl. & fr. Aug. 1990, *Bukenya* 69, 70.

Section **Monodolichopus** Bitter in Feddes Repertorium Beih. 16: 297–307 (1923). Type species: *S. coagulans* Forssk. [fide Seithe (1962) as *S. dubium* Fresen.].

23. *Solanum coagulans* Forssk. *Flora aegyptiaco-arabica* 108 and 47. Cent. II55 (1775). Type: Yemen, *Forsskål s.n.* (C).

Perennial herb, often with several stems up to 0.7 m high. *Stems* with white stellate hairs, usually covered with dense straight yellow prickles. *Leaves* very variable, up to 100 $\times$ 50 mm or more, ovate-lanceolate, prickly and hairy. *Inflorescence* racemose, with 6–10 flowers. *Corolla* blue-violet, 10–15 mm diam. *Stamens* unequal, one filament slightly longer than rest. *Fruit* yellow, globose, 10 mm diam., dry, usually completely enclosed by heavily armed accrescent calyx. *Seeds* shiny black.

Jaeger (1985) took a broad view of the species to include *S. dubium* Fresen., *S. thruppi* C.H. Wright, *S. depressum* Bitter and *S. ellenbeckii* Dammer. On the other hand Whalen (1984) used *S. thruppi* for *S. dubium* and commented that: 'S. dubium was published by Fresenius in 1834 but was pre-dated by *S. dubium* Dunal (1813) an unrelated species. A still earlier name is *S. coagulans* Forssk. (1775), but that epithet has been persistently misapplied and probably should be rejected'. This controversy needs to be resolved.

S. coagulans is not common in Uganda. It has been collected from Ankole and Karamoja. These are pastoral areas and the species is noted to withstand overgrazing pressures due to its heavy armature and creeping nature. On the African continent, it occurs from Egypt to Tan-

zania. It has no clear relatives among the Old World solanums (Whalen 1984).

Vouchers: U1: Kangole, Karamoja, fl. & fr. May 1940, *Thomas* 3482. U2: Mbarara, fl. & fr. 1925, *Maitland* 1377.

Section **Oliganthes** (*Dunal*) *Bitter* in Feddes Repertorium Beih. 16: 1 (1923); D'Arcy: 272 (1972). Lectotype: *S. indicum* auct. non L. (= *S. anguivi* Lam.), fide D'Arcy (1972).

24. ***Solanum anguivi* Lam.** in Tableau Encyclopédique et Méthodique: 23 (1794); Hepper: 287–292 (1978). Type: Madagascar, *Commerson s.n.* Holotype: MPU, syntype P, fide Hepper (1978). According to D'Arcy & Rakotozafy (1994), Hepper (1978) has chosen a lectotype, and not indicated the holotype, because a specimen exists in P-JU which Lamarck is sure to have examined.

For synonymy see Whalen (1984) and Bukenya & Hall (1988).

Shrub 1.5–3.0 m high. *Stem* bearing small, sessile stellate hairs with 4–8 $\pm$ equal arms; sometimes prickly. *Leaves* elliptic-ovate, 100–200 $\times$ 50–100 mm, sinuate to distinctly lobed, 2–4 pairs of lobes, lobes 20–30 mm long, apex acute to obtuse, base oblique, occasionally truncate or subcordate; both surfaces of leaves have $\pm$ sessile stellate hairs with 6–10 $\pm$ equal arms; petiole 20–60 mm long, with dense stellate hairs. *Inflorescence* a raceme-like cyme, 5 to > 15-flowered, occasionally flowers solitary, extra-axillary, flowers mostly hermaphrodite, occasionally distal flowers with short styles, functionally male; peduncle 0–3–6 mm long; pedicel 4–15 mm long, bearing stellate hairs. *Corolla* $\pm$ 10 $\times$ 10 mm, white, occasionally with light purple veins on outer surface; with stellate hairs outside, $\pm$ glabrous on inner surface. *Fruit* 7–18 $\times$ 8–12 mm, mostly globose, smooth, green or white when young, red when ripe; stalk 8–15 mm long, usually erect, occasionally horizontal or decurved. *Seeds* 1.5–2.1 $\times$ 1.9–2.9 mm.

S. anguivi is a rather polymorphic species. It exhibits tremendous variation in features such as prickliness, pubescence and inflorescence. This variation is possibly partly due to domestication and partly to selection. There has been a shift from prickly, many-flowered and small-fruited types to prickless, less-flowered and large-fruited types (Bukenya 1980).

Bitter (1923) recognised more than 10 subspecies and several varieties for this species. Jaeger (1985) recognised five subspecies of *S. anguivi*. A revision of Bitter's infraspecific classification is necessary, following experimental work. Many of Bitter's infraspecific names are likely to be reduced to synonyms. No infraspecific combinations of Bitter's subspecific names have yet been published for *S. anguivi* (Jaeger 1985).

Lester & Niakan (1986) demonstrated that *S. anguivi* is most likely the wild progenitor of the red or orange-fruited garden eggplants (*S. aethiopicum*) commonly cultivated in Africa.

In Uganda *S. anguivi* is a minor crop, grown for its fruits. It also grows as a weed, possibly dispersed by birds. *S. anguivi* is widely distributed on the African continent and its neighbouring islands, e.g. Madagascar.

Vouchers: U1: Napak, Karamoja, fl. & fr. June 1950, *Eggeling* 5956. U2: Nyaruzinga Bushenyi, fl. & fr. Oct. 1990, *Bukenya* 104; Kalinzu Forest, fr. Mar. 1970, *Synnott* 415. U3: Budondo Jinja, fr. Aug. 1991, *Bukenya* 126. U4: Bukenaga Mityana, fl. & fr. Aug. 1990, *Bukenya* 67.

25. ***Solanum aethiopicum* L.**, *Amoenitates academicae*: 307 (1759); Dalziel: 432 (1937); Heine: 332 (1963); Gbile: 115 (1979). Lectotype: 'Habitat in Aethiopia', Burser vol. 9, No. 17 (IDC microf. 1064, 51: 2) selected by Hepper & Jaeger (1985).

Lester & Niakan's (1986) biosystematic studies showed that all the African taxa of *Solanum* section *Oliganthes* series *Aethiopica* recognised by Bitter (1923): *S. gilo* Raddi (including *S. olivare* Paill. & Bois); *S. zucagnianum* (= *S. aethiopicum* L. sensu Bitter); *S. aethiopicum* L. and *S. aethiopicum* var. *aculeatum* (= *S. integrifolium* auct. non Poir.), comprise a single species. They gave these four taxa non-Linnaean names under *S. aethiopicum* L. These are Gilo group, Shum group, Kumba group and Aculeatum group, respectively.

The Gilo group is cultivated in Africa for its fruits; Aculeatum group is grown in several European gardens, not African; Shum group is a leafy vegetable in tropical Africa, and Kumba group is cultivated for its large fruits and leaves, especially around the Niger River.

The Gilo and Shum groups occur in Uganda. Lester & Niakan's system (1986) is followed.

25a. *Solanum aethiopicum* Gilo group

For synonymy see Heine (1963), Whalen (1984) and Jaeger (1985).

Shrub 1–2 m high; stem bearing tiny sessile stellate hairs of 4–5 $\pm$ equal arms. *Leaves* elliptic-ovate, 100–240 $\times$ 70–180 mm, margin sinuate-repand to distinctly lobed with 2–4 pairs of lobes up to 50 mm long, apex acute, base oblique; both surfaces but especially the lower, with $\pm$ sessile stellate hairs with 7–9 unequal arms; petiole 15–18 mm long; prickles may occasionally be present on young leaves. *Flowers* usually solitary or two next to each other, rarely 3–5 or more arising from a common stalk, extra-axillary and hermaphrodite. *Corolla* $\pm$ 15 $\times$ 20–30 mm, white, occasionally light purple; petal tips apiculate, incurved; inner and outer surface of corolla with stellate hairs; pedicel $\pm$ 15 mm long. *Fruit* ellipsoid, globose or oval, 13–70 $\times$ 15–50 mm, smooth or with shallow longitudinal grooves, usually solitary, occasionally two or more together, green, white or purple when young, red when mature; fruit stalk 16–40 mm long, mostly decurved. *Seeds* 3 $\times$ 4 mm.

The Gilo group is by far the most widely grown cultivar group of *Solanum* species throughout southern Uganda. Its fruits are used in soup or stew preparation. It is preferred to *S. melongena* because it has softer flesh than *S. melongena*. Within the Gilo group there is considerable

variation, especially in the shape, size and colour of the fruit. This cultivar group is native to Africa and is believed to have arisen from the wild, weedy and semi-cultivated but poorly domesticated *S. anguivi* (Lester & Niakan 1986).

Vouchers: U2: Kyembogo D.F.I., fl. & fr. Oct. 1990, *Bukenya* 109. U3: Abwangati Tororo, fl. & fr. Aug. 1991, *Bukenya* 134. U4: nr Kisasa Bukoto, fl. May 1972; Kivuuvu Mityana, fl. & fr. Aug. 1990, *Bukenya* 58.

25b. *Solanum aethiopicum* Shum group

S. zuccagnianum Dunal (1813, 1852).

Subshrub about 0.6 m high; stem glabrous. *Leaves* ovate, about 150 × 100 mm, apex acute, base oblique, attenuate or truncate, margin repand; young leaves on both surfaces with small, sessile, stellate hairs with 5–8 more or less equal arms; mature leaves subglabrous; petiole 50–60 mm long. *Inflorescence* 3–10-flowered, sessile or flowers solitary, lateral; flowers hermaphrodite; pedicel ± 7 mm long with scattered stellate hairs. *Corolla* white, 5–7 mm long × ± 10 mm wide, glabrous; flower buds with dense stellate hairs. *Calyx* as long as the corolla tube. *Style* with stellate hairs. *Fruit* globose, 15–35 mm diam., green with dark green stripes when young, shiny red when ripe; fruiting calyx ± 7 mm long; stalk up to 12 mm long. *Seeds* 2.8 × 3.0 mm.

In Uganda the Shum group is a popular leaf vegetable in Buganda region, from where it has been introduced by migrants from Buganda to a few areas in western and eastern Uganda. It is native to Africa and is frequently cultivated in tropical Africa. It is less polymorphic than its relatives, the Gilo group and *S. anguivi*.

Vouchers: U2: Nyaruzinga, fr. Oct. 1990, *Bukenya* 106. U3: Budondo Jinja, fr. Aug. 1991, *Bukenya* 127. U4: 2 km E of Budo, fl. & fr. Nov. 1972, *Katende* 1727.

26. *Solanum albicaule* Kotschy ex Dunal in A.P. de Candolle, *Prodromus systematis naturalis regni vegetabilis* 13,1: 204 (1852); C.H. Wright: 255 (1906); Bitter: 101 (1923); Carvalho & Gillet: 237 (1960); Heine: 204 (1963). Type: Sudan, Kordofan, *Kotschy* 309 (G, holo.).

The species is sunk under *S. forskalii* Dunal by D'Arcy & Rakotozafy (1994).

For synonymy see Heine (1963).

An undershrub about 1 m high. *Branches* slender, shortly hairy-tomentose; hairs stellate. *Leaves* rather small, ovate, 20–70 × ± 10 mm, subentire, covered with sessile stellate hairs on both surfaces. *Inflorescence* 3–6-flowered. *Flowers* bluish purple. *Calyx* about 3 mm long. *Corolla* 8–13 mm long. *Fruit* green with white stripes when young, yellow when ripe, up to 10 mm diam.

S. albicaule has been collected from the dry region of Karamoja. It extends into NE Africa (Sudan, Somalia, Eritrea and Egypt) and west and NW Africa (Senegal, Chad, Mauritania). Elsewhere, it has been recorded for

Arabia, Pakistan and India. It seems to be a species of arid lands. It has no close relatives in section *Oliganthes*.

Vouchers: U1: 5–6 km N of Lothea Bokora Karamoja, fl. May 1970, *Lye* 5455; 5 km S of Kantaku Bokora Karamoja, fl. & fr. June 1970, *Katende* 442.

27. *Solanum cyaneo-purpureum* De Wild., *Plantae bequaertianae* 1: 425 (1922). Type: Zaïre, Kabare, *Bequaert* 5333 (BR).

For synonymy see Whalen (1984) and Jaeger (1985).

Clambering shrub 2–3 m high; young stems, leaves on both surfaces with stalked stellate hairs; stem, petiole and midrib armed with short recurved prickles. *Leaves* ovate, 30–80 × 20–40 mm, entire or sinuate; petiole 5–20 mm long. *Inflorescence* 3–10-flowered, racemose. *Corolla* purple, up to 10 × 180 mm; pedicel up to 10 mm long. *Fruit* red when mature, ± 10 mm diam.; fruit stalk 10–20 mm long.

S. cyaneo-purpureum is common in the shrub forests in the plains of southwestern Uganda. It also occurs in Rwanda, Burundi and eastern Zaïre and often grows on termite mounds. It is related to *S. taitense* Vatke and *S. hastifolium* Hochst.

Vouchers: U2: nr Gayaza Rwampara Ankole, fl. & fr. Oct. 1932, *Eggeling* 661. U4: 17–18 km SE of Ntusi Mawogola, fl. & fr. Oct. 1969, *Lye* 4479.

28. *Solanum hastifolium* Hochst. ex Dunal in A.P. de Candolle, *Prodromus systematis naturalis regni vegetabilis* 13,1: 284 (1852). Type: Sudan, Kordofan, *Kotschy* 393 (MPU, holo.; K!, iso.).

For synonymy see Whalen (1984).

Shrub, often scandent, up to 2 m high; branches, petiole and midrib armed with small recurved prickles; stems and both surfaces of leaves covered with stalked stellate hairs. *Leaves* ovate, entire or sinuate, base shortly cuneate, about 50–70 × 20–30 mm. *Inflorescence* 2–6(–10)-flowered, umbelliform. *Corolla* violet, up to 10 × 15 mm. *Fruit* red when mature, ± 10 mm diam.

S. hastifolium is a deciduous bushland species of NE Africa, from northern Tanzania through Kenya and eastern Uganda to Sudan, Ethiopia and Somalia. It is rather polymorphic and often confused with *S. taitense* Vatke. It is also related to *S. cyaneo-purpureum* De Wild.

Vouchers: U1: nr Rupa, Karamoja, fl. & fr. Sept. 1958, *Wilson* 585. U4: Katuugo Buruli, fl. & fr. Oct. 1970, *Katende* 716.

29. *Solanum taitense* Vatke in *Linnaea* 43: 327 (1882). Type: Kenya, between Ndi and the river Tsavo, *Hildebrandt* 2605 (B⁺; isotypes possibly at L, M, P).

Slender-stemmed scandent shrub to 2 m tall; stem, petiole and midrib armed with small recurved prickles. *Leaves* lanceolate, entire, repand or lobed, 40–80 × 20–40 mm, on both surfaces with stalked stellate hairs. *Inflorescence* (1)2–4-flowered. *Corolla* pinkish purple, 8–15 ×

15–20 mm. *Fruit* green with white stripes when young, red when mature, $\pm$ 10 mm diam.

S. taitense is closely related to *S. hastifolium* and the two are often confused with each other. The former has a simpler inflorescence than the latter and leaf shapes are different in the two species. *S. taitense* is found in bushlands of Masaka, Ankole and Karamoja. It also occurs in Kenya and Tanzania.

Vouchers: U1: 5 km of Kantaku Bokora Karamoja, fl. & fr. June 1970, *Katende* 436. U4: 1–2 km E of Kikoma Mawogola, fl. & fr. Oct. 1969, *Lye* 4435.

30. *Solanum usambarense* Bitter & Dammer in Bitter, Feddes Repertorium Beih. 16: 40 (1923). Syn-types: *Holst* 380, 8921, 8925a (K!), 9091a; *Eick* 28a, 200, 273, 382; *Volkens* 616; *Buchwald* 380. All collected in northern Tanzania and all cited with original description.

Shrub up to 3 m tall, armed heavily with prickles, indumentum pilose. *Leaves* ovate, up to 200×150 mm, margin lobed, base truncate and unequal and may be shortly attenuate, covered with stellate hairs. *Inflorescence* 8- to many-flowered rachis simple or branched, racemose. *Corolla* creamy white with a purple tinge on the veins, $\pm$ 10 mm diam. *Fruit* orange-red or red, $\pm$ 8 mm diam.

S. usambarense has often been confused with *S. anguivi* (*S. indicum*). Although the two are closely related, *S. usambarense* is easily distinguished from *S. anguivi* by inflorescence and infructescence characters.

S. usambarense occurs in the shrub layer of the forests on mountains of Rwenzori, Elgon and Kigezi. It also occurs in the mountains of Kenya and Tanzania.

Vouchers: U2: Virunga-Kette Nkanda, fl. & fr. Nov. 1954, *Stauffer* 899. U3: Buhekeke Bugishu, fl. & fr. July 1926, *Maitland* 1213 (sheet 2).

Section **Torva** Nees in Transactions of the Linnean Society: 51 (1837); D'Arcy: 273 (1972). Type species: *S. torvum* Sw.

31. *Solanum giganteum* Jacq., Collectanea 4: 125 (1790); Jacq.: 11, t. 382 (1792). Type: collected near the Cape of Good Hope and cultivated in Vienna; in the absence of a specimen, the illustration t. 328 (fide Jaeger 1985) is taken as the type.

Shrub or tree up to 8 m high; stem and young leaves covered with white indumentum of tiny sessile stellate hairs; mature leaves with sessile stellate hairs on the undersurface, upper surface almost glabrous apart from occasional sessile stellate hairs; stem and petioles with flat triangular prickles. *Leaves* ovate to elliptic, up to 280×120 mm. *Inflorescence* paniculate, terminal or subterminal, 20 to > 60 -flowered. *Flowers* violet to purple, 8–10 mm long. *Fruit* green when young, red when ripe, globose, $\pm$ 10 mm diam.

S. giganteum is fairly common in Uganda. It is a disjunct montane species stretching southwards from Ethiopia

to South Africa, and west to Cameroon. It has also been recorded in S India and Sri Lanka.

Vouchers: U2: Budongo, fl. & fr. Nov. 1932, *Harris* 161. U3: Mt Elgon, fl. Apr. 1930, *Lubenberg* 1664. U4: Entebbe, fl. & fr. Sept. 1922, *Maitland* 217.

32. *Solanum kagehense* group

This group was brought together by Jaeger (1985) for the convenience of dealing with material belonging to four closely related species: *S. kagehense* Dammer: 187 (1906). Type: Tanzania, Muansa, *Fischer* 78 (isotype LE?); *S. muansense* Dammer: 243 (1912). Type: Tanzania, Muansa, *Stuhlmann* 4504 (iso. HBG?); *S. sordidescens* Bitter: 260 (1921). Type: Mozambique, Tschumo, in Matumbi Mts, *Busse* iii 3097 (iso. E.A.); *S. wittei* Robyns: 82 (1943). Type: Zaïre, Kabasha, *De Witte* 1142 (holo. BR?).

Jaeger (1985) did not make new combinations since his grouping was based on published descriptions. He suggested that a study of the types should be undertaken before new combinations are made. His approach was adopted in this study.

Shrubs up to 3 m high. *Stem* with broad-based prickles and scattered sessile stellate hairs with $\pm$ equal arms. *Leaves* elliptic, entire or repand, up to 150×70 mm; upper surface with sparse sessile stellate hairs about 6-armed, middle arm much longer than rest, lower surface with sparse or heavy cushion of same type of hairs as on upper surface. *Inflorescence* cymose with flowers often subumbellate on branched peduncle, 10–20-flowered. *Corolla* violet, $7\text{--}10 \times 14$ mm. *Fruit* red when ripe, $\pm$ 7 mm diam.

S. kagehense group occurs in all the geographical regions of Uganda. It is common in the East African region as a whole, especially in thickets and areas of light shade between 600–1 500 m. It is related to *S. renschii* Vatke. Some past plant collectors have confused it with *S. giganteum*.

Vouchers: U1: Kaabong Karamoja, Sept. 1950, *Dawkins* 643. U2: Ruizi R., Nov. 1950, *Jarrett* 208. U3: Serere Labori, July 1926, *Maitland* 1349; Busoga, June 1925, *Maitland* s.n.. U4: 5 km S of Sembabule, fr. May 1971, *Katende* 881.

33. *Solanum renschii* Vatke in Linnaea 43: 328 (1882). Type: Kenya, Ukamba, *Hildebrandt* 2735 (K!, iso.).

For synonymy see Whalen (1984) and Jaeger (1985).

Shrub or subshrub. *Stem* covered when young with small sessile stellate hairs with about $8 \pm$ equal arms; stem and petiole bear broad-based prickles; veins with tiny prickles. *Leaves* $50\text{--}80 \times 30\text{--}40$ mm, ovate, entire; upper surface covered with same type of hairs as above; lower surface covered with a heavy cushion of sessile stellate hairs, larger than above and with more than $10 \pm$ equal arms. *Inflorescence* corymbose, 20–50-flowered. *Corolla* pale violet, $\pm 10 \times 13$ mm. *Fruit* ± 8 mm diam., red/black when ripe.

S. renschii is endemic to eastern Africa, and is a variable species. Jaeger (1985) suggested that *S. kwebense* N.E. Br., *S. munitum* Bitter, *S. tettense* Klotzsch and the material in his *S. kagehense* group could be incorporated in a broad concept of the species. Whalen (1984) lists *S. tettense* and *S. wittei* A. Robyns as synonyms of *S. renschii*. *S. wittei* was included in Jaeger's *S. kagehense* group. If *S. tettense* and *S. renschii* are synonymous, then *S. renschii* should be sunk under *S. tettense*, having been published 21 years later than *S. tettense*. In Uganda *S. renschii* is restricted to the arid region of Karamoja.

Vouchers: U1: Moroto Karamoja, fl. & fr. Sept. 1956, *Bally* 10788; foothills of Mt Moroto, fl. & fr. Oct. 1952, *Verdcourt* 809.

D. Subgenus **Potatoe** (*G. Don*) *D'Arcy*, in *Annals of the Missouri Botanical Garden* 59: 272 (1972); *D'Arcy*: 750 (1973). Type species: *S. tuberosum* L.

Herbs, rarely woody, often glandular-pubescent and aromatic, unarmed; hairs simple. *Leaves* mostly compound or deeply lobed, but simple, entire leaves often present at certain stage. *Inflorescence* mostly paniculate; peduncles once or ternately branched, often pendulous; pedicels mostly articulating near base or above it. *Fruit* 10–20 mm diam.

The subgenus is represented in Uganda by two sections: *Petota* and *Jaminosolanum*.

Section **Petota** *Dumort.* *Florula belgica*: 39 (1827). Type species: *S. tuberosum* L.

34. ***Solanum tuberosum* L.**, *Species plantarum*: 185 (1753); *D'Arcy*: 752 (1973). Lectotype: LINN 248.12 labelled '*S. tuberosum*' (fide Hawkes 1956) (LINN IDC microf. 138: II.4).

Herb $\pm$ 1 m high; stem with shallow grooves when dry, and simple hairs; stolons tuberiferous. *Leaves* compound, interceptedly imparipinnate; major leaflets 3–7, alternating with $\pm$ 3 pairs of minor leaflets; leaflets elliptic to oblong-elliptic, $\pm$ 50 $\times$ 25 mm; simple hairs on both surfaces; petiole up to 60 mm long. *Inflorescence* paniculate, 10–30-flowered, terminal on long peduncle $\pm$ 80 mm long; pedicel 7–15 mm long with simple hairs. *Flowers* hermaphrodite. *Corolla* white, bluish purple or purplish red, 10–22 $\times$ $\pm$ 20–30 mm. *Anthers* 5, occasionally 6. *Calyx* $\pm$ 7 mm long, with simple hairs on outer surface, glabrous within. *Fruits* globose, $\pm$ 7 mm diam. $2n = 48$.

S. tuberosum, is a mainly temperate crop introduced in East Africa about 100 years ago by missionaries from Europe. The main area of commercial cultivation of potatoes in Uganda is Kigezi, a mountainous area with cool climate. Potato growing has spread to other highland areas in the country. Lowland areas also in recent years have started growing especially lowland cultivars. Potato blight seems to be a more serious limiting factor to cultivation of potatoes than climate.

Vouchers: U2: Kacwekano D.F.L., fl. Oct. 1990, *Bukenya* 99–101. U4: Kamenyamigo D.F.L., fl. Oct. 1990, *Bukenya* 93; Makerere Univ., fl. Oct. 1990, *Bukenya* 92.

Section **Jaminosolanum** *Bitter ex Seithe* in *Botanische Jahrbücher* 81: 191 (1962); *D'Arcy*: 757 (1973). Type species: *S. jasminoides* Paxton.

35. ***Solanum seaforthianum* Andrews**, *The Botanist's Repository*: pl. 504 (1808). Lectotype: the plate cited (fide Symon 1981).

Woody climber; stem terete, glabrous apart from occasional tiny simple hairs. *Leaves* compound, imparipinnate to deeply pinnatifid with about 7–9 leaflets or lobes; leaflets up to 50 $\times$ 30 mm, elliptic; lower leaflets with $\pm$ winged petiolule up to 5 mm long; upper leaflets (i.e. lobes) webbed together; lamina glabrous; margin ciliolate with sparse simple hairs; petiole up to 50 mm long. *Inflorescence* glabrous, mostly terminal or lateral, paniculate with up to 30 flowers or more; pedicel up to 7 mm long. *Flowers* hermaphrodite. *Corolla* blue to violet, up to 15 $\times$ 20 mm. *Fruit* spherical, $\pm$ 10 mm diam., red when mature; up to 40 from an inflorescence; fruit stalk 10–14 mm long. *Seeds* 2 $\times$ 2 mm.

S. seaforthianum is an introduced decorative climber seemingly naturalized. It is native to central America and the West Indies, but has spread to many parts of tropical Africa, where it has been introduced for decorative purposes.

Vouchers: U1: Mulago hospital, fl. & fr. Apr. 1990, *Bukenya* 45; fl. & fr. Aug. 1990, *Bukenya* 55; Makerere Univ., fl. & fr. Apr. 1990, *Bukenya* 48.

CONCLUSIONS

Solanum americanum, *S. tarderemotum*, *S. incanum*, *S. macrocarpon* (wild group), *S. anguivi* and *S. kagehense* group are the most widespread taxa in Uganda, occurring in all four geographical regions of the country. On the other hand, *S. scabrum*, *S. terminale* subsp. *inconstans*, *S. benderianum*, *S. albicaule*, *S. renschii* and *S. seaforthianum* are the least widespread, occurring in only one region. The rest of the taxa are either fairly well distributed (occurring in three regions) or relatively rare (occurring in two regions). This is associated with habitat preference and/or utilization.

There is tremendous morphological variation within the *S. macrocarpon* complex. *Bukenya* (1993) recognised four groups belonging to the *S. macrocarpon* complex in Uganda. These include *S. macrocarpon* (wild group—*S. dasyphyllum*); *S. macrocarpon* (semi-wild group), *S. macrocarpon* 'Mukono' cultivar and *S. macrocarpon* 'Nabingo' cultivar. Sections *Solanum* and *Oliganthes* are also very variable. Experimental work on these taxa is still necessary to resolve their taxonomy.

At least 25 species in Uganda are useful or economically relevant. Pharmacological studies are needed to authenticate the medicinal potency of the various species used in traditional medicine. More attention should be paid to crops in terms of research to control pests and diseases, to increase yield and to produce well-adapted cultivars.

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