Solanum (Solanaceae) in Uganda

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Keywords: food crops, indigenous taxa, key, medicinal plants, ornamentals, Solanum, Solanaceae, Uganda, weeds

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 kultivar groepe 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 omamentele gebruik 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. in- canum* 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...
between morphologically similar plants leading to
cytotaces 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 for­
mation 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 at­
tempting to solve some of the above problems and im­
proving 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) pro­
vided short descriptions of only three Ugandan species
of Solanum, i.e. S. terminale Forsk., 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 Sys­
tematic 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 ± glabrous; inflorescence corymbose, cyme subfasciculate or paniculate: |
| 5a Leaves ± 280 × 120 mm; inflorescence paniculate: | 31. S. giganteum |
| 5b Leaves < 200 × 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. jazerhense group |
| 6b Inflorescence corymbose; 20-50-flowered; leaves 50-80 × 30-40 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 aecrescent calyx; seeds shiny black | 23. S. coagulans |
| 7b Fruit not dry, seeds yellow-brown: |
| 8a Corolla 17–45 mm long; fruit 20–130 × 30–100 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 < 40 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. macrocarpon |
| 12b Petiole 40-70 mm long, prickles present or absent: |
| 13a Prickles almost always absent; fruit 60-130 × 30-100 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. cyanox-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. taifense |
| 15b Plants not clambering or scandent: |
| 18a Leaves rather small, 24-70 × 10 mm, fruits yellow when ripe | 26. S. albicaule |
| 18b Leaves 100-200 × 50-150 mm, fruits red when ripe | |
| 19a Plants generally non-prickly; occasionally a few prickles present; flowers solitary or 5-15 in a raceme-like |
| 19b Plants heavily armed with prickles; inflorescence 8-10-flowered, rachis simple or branched; racemose | 24. S. anguivi |
| | 30. S. usambarense |
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 long, often connivent anthers dehiscing by terminal pores and some—

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

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.

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

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 × 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** ± 1 × 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.
from the S. nigrum complex. These are S. nigrum subsp. nigrum, S. americanum Mill., S. scabrum Mill., S. sarrachoides Sendtn., S. villosum Mill., S. grossidentatum A. Rich., S. florulentum Miller, and S. tarderemotum Miller.

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 ± 3 mm long; petiole 20–35 mm long. Inflorescence lateral, lax cymes, 6–8-flowered. Corolla ± 4 mm long. Fruit ± 7 mm diam.; fruit stalk decurved, deep purple to shiny black when ripe. Seeds ± 1 x 2 mm. 2n = 72 (Edmonds 1977). Pollen diam. 17.7–19.2 μm.

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: Ul: Maraca Kiromoro W. Nile, fl. & fr. May 1971. Bata 19. U2: Rwenzori Mtn. fl. Aug. 1938. Parseglove 358. U3: Nakaloke Mbale, fl. Aug. 1991. Bakemba 136. U4: M. 12 Kla-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).

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 x 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 ± 5 mm long. Corolla ± 7 x 15 mm. Anthers purplish brown. Fruit broadly ovoid, 13 x 17 mm, dull purple-black when ripe; fruit stalk erect or recurved 30–40 mm long. Seeds 1 x 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’.
Bothalia 25,1 (1995)

4. *Solanum sarrachoides* Sendtn. in Martius, Flora brasiliensis 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, ac- crescent, 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, Nyabibata Rwenzori, fl. Jan. 1969, Lye 1385; 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. Dodoh, fl. & fr. Apr. 1951, Jarren 454; U2: Ruizi R., fl. & fr. July 1952, Laid 82.

6. *Solanum grossedentatum* A. Rich., Tentamen florae abyssinicae 2: 101 (1850). Type: Ethiopia, 'crescit in provincia Tchelkotke', 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: Paula W. Nile, fl. & fr. Aug. 1953, Chandler 185, U2: Mahovka Rwenzori, fl. Dec. 1925, Maltland 1290, U3: Budam 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. *sensa lato*.

Vouchers: U2: Kigezi D.F.I., fl. & fr. Aug. 1972, Goode 2722, U4: Kibua, 35 ml SE of Kla. fl. & fr. June 1957, Griffiths 47.

8. *Solanum targeremotum* 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. tarderemotum 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: Tergo W. Nile, fl. & fr. Apr. 1938, Hazel 496; U2: Kigerzi D.H.L., fl. & fr. Aug. 1972, Goode 172; U3: Badudiri Bugishu, fl. & fr. Jan. 1932, Chandler 458; U4: Nakyesanja nr Kawanda, fl. & fr. Mar. 1972, Damudula 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 aegyptiacaroarabica: 45 (1775); Bitter: 301 (1922); Heine: 247 (1960). Type: Yemen, Mokhaja, Forsskal 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: Kigerzi, fl. Feb. 1956, M.C. 908; Kaliruzu Forest, Igara, fr. June 1970, Katende 352; U3: Bunya, Busanga, fl. Nov. 1937, Webb 62; U4: 2 km E of Bujuku-Mubende Rd, fl. Feb. 1969, Ise 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 paniculate 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 paniculate, 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. Kigerzi, 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); Cameroon, Kalbreyer 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, Brasnett 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 8996/a, nr Kapkwata Forest St. Sebei, fl. Jan. 1969, Eve 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 Elliot 7733 (K!).

Climbing shrub. Leaves lanceolate, ± glabrous. Inflorescence terminal, a lax cymose panicle with > 50 flowers. Corolla violet, ± 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. macrothyrsum 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 ± 50 or more flowers. Corolla light blue to purple, ± 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., Deliciæ florae et faunæ insulariae 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 × 100 mm, apices acute, bases attenuate; both surfaces of leaves densely covered with stellate hairs; petals to 70 mm long. Inflorescence terminal, paniculate, many (>50)-flowered. Flowers purple; pedicels ± 5 mm long. Corolla 15 mm diam.; lobes 5 mm long. Anthers differing slightly in length, i.e. 1 short (± 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 × 11 mm; stalk ± 5 mm long. Seeds 2 × 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 (Bukenya & 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, Bukunya 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. Anthers 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); Aceuleigerum, Melongena, Monodolichopus, Oliganthes and Torva.

Section Acanthophora Dunal, Histoire Naturelle, Médicale et Economique 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: Plak.: t. 226, fig. 1 (1696). (Typotype: Herb. Sloane Vol. 98 fol. 59 (BM). For reasons for type selection see Jaeger (1985).) Type species: 5. (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 ± 110 × 90 mm, lobed or doubly lobed to about 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 mammilla, 5 mammillae 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 (Duke 1970).

Vouchers: U1: Serere, Teso, fr. Dec. 1931, Chandler 201. U4: Makerere Univ. fl. & fr. Feb. 1992, Bakerya 143 (seed from Nakasero nr Kampala).

16. Solanum aculeatisimum Jacq., Icones plantarum rarioorum 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 ± 180 × 160 mm, lobed or doubly lobed to 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, ± 17 × 30 mm, peduncle 0.5 mm long; pedicel ± 11 mm long. Fruit globose, ± 35 mm diam. Seeds 3 × 4 mm, brownish.

S. aculeatisimum 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: Kitigo N.P., fl. & fr. Sept. 1972, Synnott 1269. U2: Kizimba Bundibugyo, fl. Sept. 1991, Bakerya 146. U4: Entebbe Region, Mar. 1921, Rev. Herb. sheet No. 681.

Section Aceuleigerum 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. Bakerya 53; Buganda Road P.S., fl. Apr. 1990, Bakerya 44; Masaka City, fl. May 1952, Lye 6840.

Section Melongena Dunal, Histoire Naturelle, Médicinale et Economique 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 ± 150 × 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
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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).

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 ± of equal length. Fruit warted, yellow when ripe, 40 x 42 mm; stalk slightly decurved, about 30 mm long. Seeds 4 x 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. thomsonii). It has many traditional uses (Bukenya 1993).

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 ± 240 x 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, ± 30 x 27 mm. Calyx, especially on the lowermost flower, very prickly, prickles ± 2 mm long. Fruits globose, 30 x ± 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. lichensteinii 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. lojera 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. lichensteinii 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: U2: Kyembogo D.F.I., fl. & fr. Oct. 1990, Bakensia 108. U3: Kyabirwa, Budondo-Jinja, fl. Aug. 1991, Bakensia 130. U4: Bukanga, Mityana, fl. & fr. Aug. 1990, Bakensia 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. sodomene) (G-DC, IDC microf. 2091; III.4).

The synonymy is discussed by Burkill (1925). Heine (1963), Whalen (1984) and Jaeger (1985).
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 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 ± 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 × 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 × 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-1 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, Bakkenya 138; U4: Nabingo, fl. & fr. Sept. 1990, Bakkenya 80.

S. macrocarpon (semi-wild group)

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

S. macrocarpon (wild group)

Vouchers: U1: Napak Karamoja, fl. & fr. July 1948, Philip 203; U2: Mile 8 Kwinginya Rwamba, fl. & fr. Sept. 1991, Bakkenya 148; U4: Kivusu-Mityana, fl. & fr. Aug. 1990, Bakkenya 61, 62.

22. Solanum wrightii Bentli. 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 sepal ± 1 mm long. Leaves ± 300 × 240 mm, with 2–3 pairs of prominent lobes up to 90 mm long, upper surface bearing simple hairs ± 1 mm long, lower surface with stellate hairs with 5–8 unequal arms on sepal ± 0.5 mm long; prickles on midrib 10–20 mm long, base 4 mm broad; petiole ± 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 × 80 mm. Calyx ± 20 mm long; pedicel ± 25 mm long. Anthers of different length (2 ± 20 mm long, 2 medium, 1 short). Fruit globose, green when young with light green patches, yellow when ripe, 50 × 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: Kyembo D.F.I, fl. & fr. Oct. 1990, Bakkenya 107; U3: Jinja town, fl. Aug. 1991, Bakkenya 125; U4: Mityana S.S., fl. & fr. Aug. 1990, Bakkenya 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 aegyptiacarabica 108 and 47. Cent. Ill5 (1775). Type: Yemen, Forskål 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 × 50 mm or more, ovate-lanceolate, prickly and hary. 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, Karamoga, fl. & fr. May 1940, Thomas 3482, U2: Mbarara, fl. & fr. 1925, Mailand 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, Commerston 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 Bukunya & Hall (1988).

Shrub 1.5–3.0 m high. Stem bearing small, sessile stellate leaves with 4–8 ± equal arms; sometimes prickly. Leaves elliptic-ovate, 100–200 x 50–100 mm, situate to distinctly lobed, 2–4 pairs of lobes, lobes 20–30 mm long, apex acute to obtuse, base oblique, occasionally truncate or suborbate; both surfaces of leaves have ± sessile stellate hairs with 6–10 ± 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 and hermaphrodite. 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 ± 10 x 10 mm, white, occasionally with light purple veins on outer surface; with stellate hairs outside, ± glabrous on inner surface. Fruit 7–18 x 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 x 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 (Bukunya 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, Karamoga, fl. & fr. June 1980, Eggeling 5956, U2: Nyaruzinga Bushenyi, fl. & fr. Oct. 1990, Bukunya 104; Kalinzu Forest, fr. Mar. 1970, Sinnott 415. U3: Budondo Jinja, fr. Aug. 1991, Bukunya 126. U4: Bukuna Mityana, fl. & fr. Aug. 1990, Bukunya 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. zuc-cagnianum (= S. aethiopicum L. sensu Bitter); S. aethio-picum L. and S. aethiopicum var. aculeatum (= S. integri-folium 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 leaves of 4–5 ± equal arms. Leaves elliptic-ovate, 100–240 x 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 ± 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 ± 15 x 20–30 mm, white, occasionally light purple; petal tips apiculate, incurved; inner and outer surface of corolla with stellate hairs; pedicel ± 15 mm long. Fruit ellipsoid, globose or oval, 13–70 x 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 x 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: Kyenjojo D.F.L., fl. & fr. Oct. 1990. Bakerya 109 U3: Abwagati Tororo, fl. & fr. Aug. 1991. Bakerya 134 U4: nr Kirawa Bukoto, fl. May 1972; Kivuuru Mitunya, fl. & fr. Aug. 1990. Bakerya 58.

25b. *Solanum aethiopicum* Shum group

*S. zuccagnianum* Dunal (1813, 1852).

Subshrub about 0.6 m high; stem glabrous. Leaves ovoid, about 150 x 100 mm, apex acute, base oblique, 5-10 mm more or less equal arms; mature leaves subglabrous; petiole 50-70 x 20-30 mm. entire or sinuate, covered with sessile stellate hairs; stems and midrib armed with short recurved prickles; 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 ± 60 mm long.

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. Bakerya 106 U3: Budondo Jinja, fr. Aug. 1991. Bakerya 127 U4: 2 km E. of Budo, fl. & fr. Nov. 1972. Katende 1727.

26. *Solanum albaicae* 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 x 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. albaicae* 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 Kantak Bokora Karamoja, fl. & fr. June 1970, Katende 442.

27. *Solanum cyanose-purpureum* De Wild., Plantae bequaertiana 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, 30-60 x 20-40 mm, entire or sinuate; petiole 5-20 mm long. *Inflorescence* 3-10-flowered, racemose. *Corolla* purple, 10 x 18 mm; pedicel up to 10 mm long. *Fruit* red when mature, ± 10 mm diam.; fruit stalk 10-20 mm long.

*S. cyanose-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, Eggelten 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 x 20-30 mm. *Inflorescence* 2-6-10-flowered, umbelliform. *Corolla* violet, up to 10 x 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. cyanose-purpureum* De Wild.

Vouchers: U3: nr Rupa, Karamoja, fl. & fr. Sept. 1958, Wilson 585. U4: Katungo Buruli, fl. & fr. Oct. 1970, Katende 716.

29. *Solanum taitense* Vatke in Linnacq 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 x 20-40 mm, on both surfaces with stalked stellate hairs. *Inflorescence* 1-2-4-flowered. *Corolla* pinkish purple, 8-15 x
15–20 mm. *Fruit* green with white stripes when young, red when mature, ± 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 Kantaka Bokora Karawunga, fl. & fr. June 1970, Katende 436. U4: 1–2 km E of Kikorna Mawogola, fl. & fr. Oct. 1969, Lye 4435.

30. Solanum usambarense Bitter & Dammer in Bitter, Feddes Repertorium Beih. 16: 40 (1923). Synotypes: Holst 380, 8921, 8925a (K!), 9091a; Eick 28a, 200, 273, 382; Volckens 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, ± 10 mm diam. *Fruit* orange-red or red, ± 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, Matundi 1213 (sheet 21).

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, ± 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, Lohberg 1664. U4: Entebbe, fl. & fr. Sept. 1922, Matundi 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. muus sentum* Dammer: 243 (1912). Type: Tanzania, Muansa, Stuhlmann 4504 (isotype HBG?). *S. sordidescens* Bitter: 260 (1921). Type: Mozambique, Tschumbo, in Matumbi Mts, Busse iii 5097 (isotype E.A); *S. wittei* Robyns: 82 (1943). Type: Zaire, 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 ± 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, 7–10 × 14 mm. *Fruit* red when ripe, ± 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. renshii* Vatke. Some past plant collectors have confused it with *S. giganteum*.

Vouchers: U1: Kaa bang Karamoja, Sept. 1949, Dawkins 643. U2: Rusizi R., Nov. 1950, Jarrett 208. U3: Serere Labor, July 1926, Matundi 1349, Busoga. June 1925, Matundi S.N. U4: 5 km S of Sembabule, fl. May 1971, Katende 881.

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

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

Shrub or subshrub. **Stem** covered when young with small sessile stellate hairs with about 8 ± equal arms; stem and petiole bear broad-based prickles; veins with tiny prickles. *Leaves* 50–80 × 30–40 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 ± equal arms. *Inflorescence* corymbose, 20–50-flowered. *Corolla* pale violet, ± 10 × 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. kwembense 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 1078; foothills of Mt Moroto, fl. & fr. Oct. 1952, Verdcourt 889.

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; pedicules once or temately branched, often pendulous; peduncles once or temately branched, often pendulous; pedicel 7-15 mm long with simple hairs.

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

**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 ± 1 m high; stem with shallow grooves when dry, and simple hairs; stolons tuberiferous. Leaves compound, interseptedly imparipinate; major leaflets 3–7, alternating with ± 3 pairs of minor leaflets; leaflets elliptic to oblong-elliptic, ± 50 x 25 mm; simple hairs on both surfaces; pedicel up to 60 mm long. Inflorescence paniculate, 10–30-flowered, terminal on long peduncle ± 80 mm long; pedicel 7–15 mm long with simple hairs. Flowers hermaphrodite. Corolla white, blue-purple or purplish red, 10–22 x ± 20–30 mm. Anthers 5, occasionally 6. Calyx ± 7 mm long, with simple hairs on outer surface, glabrous within. Fruits globose, ± 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.I., fl. Oct. 1990, Bukensya 99–101. U4: Kameryamigo D.F.I., fl. Oct. 1990, Bukensya 93; Makerere Univ., fl. Oct. 1990, Bukensya 92.

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

**35. Solanum searorhianum 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 x 30 mm, elliptic; lower leaflets with ± winged petiolute 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 x 20 mm. Fruit spherical, ± 10 mm diam., red when mature; up to 40 from an inflorescence; fruit stalk 10–14 mm long. Seeds 2 x 2 mm.

*S. searorhianum* 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, Bakensya 45; fl. & fr. Aug. 1990, Bakensya 55; Makerere Univ., fl. & fr. Apr. 1990, Bakensya 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. allicaule, S. renschii and S. searorhianum 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. dasyp hyllum); *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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