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Solanum (Solanaceae) in Ghana

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ABSTRACT

Of the 22 species, subspecies and varieties in the genus *Solanum* L. (Solanaceae) that occur in Ghana, about 15 are indigenous. In Ghana serveral members of the genus are utilized as food crops while others are put to medicinal and ornamental use. Up-to-date and detailed descriptions for all the *Solanum* taxa occurring in Ghana and a key to the species are provided.

UITTREKSEL

Van die 22 spesies, subspesies en variëteite in die genus *Solanum* L. (Solanaceae) wat in Ghana voorkom, is ongeveer 15 inheems. In Ghana word verskeie lede van die genus as voedselgewasse benut terwyl ander as medisinale en sierplante aangewend word. Die jongste en uitvoerige beskrywings van al die *Solanum*-taksons wat in Ghana voorkom en 'n sleutel tot die spesies word verskaf.

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INTRODUCTION

The genus *Solanum* L. contains about 2 000 species of which about 15 are indigenous to Ghana. The rest have been introduced and are now cultivated crops, viz. *S. scabrum* Mill., *S. melongena* L. and *S. tuberosum* L. Others are introduced ornamentals, including *S. mammosum* L., *S. capsicoides* All. and *S. wrightii* Benth., whereas *S. americanum* Mill. and *S. arundo* Mattei are weeds of recent introduction and a species introduced into Legon Botanical Garden, respectively.

The genus is of great economic importance, with several species that are food crops, yielding edible leaves, fruits and tubers. Other species are medicinal plants, ornamentals or weeds of cultivation. The genus is widely distributed throughout the world.

Since the genus *Solanum* was described by Linnaeus in 1753, it has been reclassified innumerable times, and a multitude of species, subspecies and varieties has been named. The major revision of *Solanum* in Africa was done by Bitter (1913, 1917, 1921, 1923), utilizing mainly collections from German expeditions. He erected a partial classification of *Solanum*. Despite some limitations, especially the validity of some of his varieties which are based on minor variations and are of very local occurrence, Bitter's work is the most authoritative available today on African *Solanum*.

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

Although the above major works and others attempted to streamline the taxonomy of *Solanum*, the genus is a difficult one and is complicated by several factors. These factors include the difficulty of associating the names of *Solanum* used by earlier taxonomists with the plants of today due to early descriptions being brief, often vague and frequently lacking in characters now considered to be diagnostic. Again some of the early names, for example many of the names of Linnaeus and those before him, were not typified, or if so, the type is not easy to discern (Hepper 1979).

Another problem is the occurrence of polyploid series within taxa (Edmonds 1977), for example tetraploids and hexaploids within the *S. nigrum* complex. These may provide a barrier to hybridization between morphologically similar plants leading to cytoraces 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. A large number of 'microspecies' or 'semispecies' (Grant 1971) occur in section *Solanum* and it is problematical to decide how many of these deserve taxonomic recognition.

Today there is no single up-to-date work covering the classification of the entire genus in West Africa. Gbile (1979) made descriptions of *Solanum* species in Nigeria. His work was however based only on the herbarium specimens kept at the Forest Herbarium Ibadan (FHI). He therefore did not treat all the *Solanum* species occurring in Nigeria. In Ghana itself not much work has been done on *Solanum*. Some data on *Solanum* are found in Floras, including the *Flora of tropical Africa* (Wright 1906) and the *Flora of west tropical Africa* (Heine 1963). In the *Flora of tropical Africa*, species were viewed in a narrow sense and interspecific variation seems to have been ignored. Species delimitation was based on inadequate material and on few morphological characters.

Wright (1975), Nsowah (1969) and Hossain (1973), studied a few species of *Solanum* in Ghana. Wright (1975), however, based his study on specimens collected from one district (Cape Coast), hence the complex range of variation of the species he studied, particularly *S. nigrum s.l.*, could not be appreciated. Nsowah (1969) unfortunately did not identify with care the several strains of garden eggs he studied.

Despite the existence of the *FWTA* edn 2 (Heine 1963), many workers, especially in horticulture and genetics, continue to misidentify *Solanum* spp. For example Epenhuijsen (1974) misapplied the names *S. gilo* Raddi to *S. macrocarpon* L., *S. incanum* L. to *S. gilo* and *S. scabrum* to *S. nigrum* L.; Nsowah (1969) misapplied *S. integrifolium* Poir to *S. gilo*.

Such misidentifications occur because, unfortunately, the *FWTA*, edn 2 does not provide full descriptions for the West African *Solanum* spp. but only gives a key to the species. With a key alone one is likely to go wrong in identification of critical species and the key in this Flora does not, in some cases, bring out differences between closely related species. This flora, like the treatment of *Solanum* by Gbile (1979), does not give consideration to experimental work on cultivated species, e.g. *S. gilo* Raddi, *S. aethiopicum* L. and *S. macrocarpon* L., hence their variability was not appreciated. Critical species like *S. nigrum* complex were treated only in the broad sense.

We have therefore attempted to provide detailed, up-to-date descriptions of all the *Solanum* spp. occurring in Ghana.

MATERIALS AND METHODS

The gross morphological studies were based on about 200 specimens. A large number of these specimens were those already existing at the Legon herbarium, Ghana, whereas others were freshly collected by the authors from various regions of Ghana.

Information on all the specimens was recorded and the morphological characters of the species scored. For

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

Species	Subgenus	Section	Series
S. nigrum	*Solanum*	*Solanum*	–
S. americanum	"	"	–
S. scabrum	"	"	–
S. terminale	"	*Afrosolanum*	–
S. erianthum	*Brevantherum*	*Brevantherum*	–
S. mammosum	*Leptostemonum*	*Leptostemonum (Acanthophora)*	–
S. aculeatissimum	"	"	–
S. capsicoides	"	"	–
S. arundo	"	*Ishyracanthum*	
S. melongena	"	*Melongena*	*Incaniformia*
S. incanum	"	"	"
S. macrocarpon	"	"	*Macrocarpon*
S. wrightii	"	"	–
S. anguivi	"	*Oliganthes*	*Afroindica*
S. aethiopicum	"	"	*Aethiopica*
S. gilo	"	"	"
S. torvum	"	*Torva*	*Torva (Eutorvum)*
S. anomalum	"	"	*Anomalum*
S. tuberosum	*Potatoe*	*Potatoe (Potato)*	*Potatoe (Tuberosa)*
S. seaforthianum	"	*Jasminosolanum*	"

some of the species, viz. *S. nigrum s.l., S. americanum, S. scabrum, S. melongena, S. macrocarpon* complex, *S. anguivi* Lam., *S. aethiopicum* L. and *S. gilo*, various accessions were collected from different localities in Ghana and were grown in an experimental plot at Legon. The morphological characteristics of the plants belonging to the above species were observed throughout the various developmental stages and measurements of, for example, flower and fruit characters were based on mature live plants. Specimens for the herbarium were obtained from these plants.

After the study all the specimens were deposited at the Legon herbarium. Some of the specimens studied are cited under the species descriptions. The infrageneric classification of Ghana *Solanum* spp. (Table 1) is based on D'Arcy (1972).

DESCRIPTIONS OF *SOLANUM* SPECIES

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

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

KEY TO SPECIES

1a Plants climbers:
- 2a Leaves deeply lobed ..... 20. *S. seaforthianum*
- 2b Leaves more or less entire:
  - 3a Fruits spindle-shaped; inflorescence lateral, up to 7-flowered ..... 4b. *S. terminale* subsp. *inconstans*
  - 3b Fruits globose; inflorescence terminal, spiciform, up to 40-flowered ..... 4a. *S.terminale* subsp. *welwitschii*

1b Plants non-climbers:
- 4a Leaves compound; stolons tuberous ..... 19. *S. tuberosum*
- 4b Leaves simple; tuberous stolons absent:
  - 5a Fruits red when mature:
    - 6a Leaves glabrous when mature, apart from a few scattered stellate hairs:
      - 7a Flowers solitary or inflorescence with less than 10 flowers; corolla 5–6 mm long; fruit about 15 mm diam. ..... 15. *S. aethiopicum*
      - 7b Flowers up to 30 per inflorescence, axillary and subfasciculate; fruits about 6 mm diam. .. 18. *S. anomalum*
    - 6b Leaves stellate-pubescent:
      - 8a Corolla about 8 mm long; inflorescence 3–20-flowered; fruits 7–15 mm long ..... 14. *S. anguivi*
      - 8b Corolla about 15 mm long; flowers usually solitary, occasionally inflorescence 2(–3 or more)-flowered; fruits 20–70 mm long ..... 16. *S. gilo*
  - 5b Fruits more or less yellow or blackish when ripe:
    - 9a Inflorescence umbelliform; hairs simple or absent; fruit blackish when mature:
      - 10a Corolla about 7 mm long; fruits about 17 mm diam. ..... 3. *S. scabrum*
      - 10b Corolla 3–4 mm long; fruits 7–10 mm diam.:
        - 11a Pollen diam. 17,7–19,2 μm; seeds 1×1 mm; 2n=24 ..... 2. *S. americanum*
        - 11b Pollen diam. 25,1–28 μm; seeds 2×1 mm; 2n = 72 ..... 1a. *S. nigrum s. str.*
    - 9b Inflorescence various, never umbellate; some hairs stellate; fruits yellow:
      - 12a Fruits pubescent ..... 5. *S. erianthum*
      - 12b Fruits glabrous:
        - 13a Small tree; upper surface of leaves with simple hairs, lower surface with stellate hairs ..... 13. *S. wrightii*
        - 13b Shrubs; hairs on both surfaces of leaves either stellate or simple, occasionally simple hairs on upper surface, simple hairs mixed with stellate hairs on lower surface:
          - 14a Leaves very small, about 35×25 mm, subsessile; prickles very much decurved ..... 9. *S. arundo*
          - 14b Leaves about 170×80–150 mm, petiolate; prickles not decurved or very slightly decurved:
            - 15a Fruits less than 10 mm diam.; inflorescence up to 40-flowered, corymbose ..... 17. *S. torvum*
            - 15b Fruits more than 10 mm diam.; inflorescence less than 15-flowered, never corymbose:
              - 16a Fruit length less than width ..... 12. *S. macrocarpon*
              - 16b Fruit length greater than (rarely equal to) width:
                - 17a Prickles almost always absent; fruits usually oval; flowers purple ..... 10. *S. melongena*
                - 17b Prickles always present:
                  - 18a Fruit with terminal nipple or mammilla ..... 6. *S. mammosum*
                  - 18b Fruit without terminal nipple or mammilla:
                    - 19a Hairs on leaves all uniformly pilose; seeds winged ..... 8. *S. capsicoides*
                    - 19b Hairs and seeds not as above;
                      - 20a Hairs on both surfaces of leaves all stellate; flowers purple ..... 11. *S. incanum*
                      - 20b Hairs on upper surface of leaves simple, lower with rare stellate hairs mixed with simple hairs; flowers white ..... 7. *S. aculeatissimum*

Subgenus **Solanum** *D'Arcy* in Annals of Missouri Botanical Garden 60: 733 (1973).

Leaves subentire or shallowly lobed, often membranaceous, indumentum simple, hairs rarely branching. *Prickles* absent. *Flowers* mostly small, congested. *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.

Section **Solanum** *D'Arcy* in Annals of Missouri Botanical Garden 60: 733 (1973).

1. **Solanum nigrum** *L.*, Species plantarum: 186 (1753); Heine: 335 (1963); Hepper: 12 (1976); Gbile: 117 (1979). All the above authors have taken *S. nigrum* in a broad sense.

Herb, about 1 m high. *Leaves* elliptic, 60–100× 40–70 mm; lamina glabrous when mature, margin entire or toothed, repand or with 2–3 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. *Fruits* 5–8 mm diam., shiny black when ripe; fruit stalk ± 10 mm long. *Seeds* ± 1×2 mm.

The name *S. nigrum* has been used in West Africa in a broad sense until the work of Edmonds (Gray 1968; Edmonds 1971, 1972). Edmonds identified some of the specimens we sent to her from the Ghana herbarium (Legon), and isolated three Ghanian taxa from the complex. These are *S. nigrum s. str.*, *S. americanum* Mill., and *S. scabrum* Mill. The latter is easy to isolate from the other taxa on account of its fruit size (more than 10 mm diam.). The rest of the complex of species awaits a thorough analysis before tens of specimens in the Ghana herbarium can be placed in the correct taxa. *S. nigrum* complex is widely distributed in Ghana.

Vouchers: Western Region: Ankobra Ferry nr Axim, fl. & fr. July 1969, *Enti GC 39163*; Busua Bay, fl. & fr. February 1956, *Morton A1796*. Central Region: Bando nr Asebu, fr. November 1962, *Hall 2411*. Eastern Region: Mampong Scarp, Akwapim, fl. & fr. June 1953, *Morton s.n.*; Mt Ejuanema, Kwahu, fl. & fr. December 1957, *Adams 5125*. Volta Region: Adzide-Keta nr Keta Lagoon, fl. & fr. August 1957, *Akpabla 1921*; Amedzofe, fr. June 1958, *Morton A3418*. Greater Accra Region: Legon Hill, fl. & fr. May 1959, *Morton A3675* Achimota, fl. & fr. February 1926, *Irvine 93*.

1a. subsp. **nigrum.**

Edmonds: 141–178 (1977).

Herb about 1 m high, with abundant 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 ± 5 mm long; petiole 20–35 mm long. *Inflorescence* lateral, umbellate cymes, 6–8-flowered. *Corolla* ± 4 mm long. *Fruit* ± 7 mm diam., shiny black when ripe. *Seeds* ± 1×2 mm. 2n=72 (Edmonds 1977). *Pollen* diam. 25,1–28 μm. This subspecies and *S. nigrum* as a whole constitute a Eurasian taxon. However, it has spread to all the other continents.

Voucher: Greater Accra Region: by the railway station, Achimota, fl. & fr. February 1954, *Morton 25359*.

2. **Solanum americanum** *Mill.* in Gardener's dictionary edn 8: (1768); D'Arcy: 735 (1973); Edmonds: 141–178 (1977).

Herb about 1 m high; stem with simple hairs when young, glabrous when mature. *Leaves* 50–80×30–50 mm; mature lamina glabrous, margin with two pairs of lobes, up to 10 mm long; petiole up to 20 mm long. *Inflorescence* lateral, umbellate cymes, 5–6-flowered; peduncle ± 10 mm long; pedicel ± 7 mm long. *Corolla* ± 3 mm long; calyx ± 1 mm long. *Fruit* up to 9×10 mm, shiny black when ripe; fruit stalk 10–13 mm long; fruiting calyx 1–2 mm long. *Seeds* 1×1 mm. 2n=24 (Edmonds 1977). *Pollen* diam. 17,7–19,2 μm.

S. americanum is an introduced weed, collected from the coast. The extent of its distribution will be fully known only after a thorough study of the *S. nigrum* complex has been made. It is of S American origin, probably recently introduced into Africa.

Vouchers: Central Region: Cape Coast (Shore) nr Castle, fr. June 1979, *Hall & Bukenya GC 47120*; Greater Accra Region: Legon Botanical Garden (experimental plot), fl. & fr. February 1980, *Bukenya S19* (grown from seed of *GC 47120*).

3. **Solanum scabrum** *Mill.* in Gardener's dictionary edn 8: (1768); Edmonds: 141–178 (1977).

Bushy subshrub 1–1,5 m high; stem with simple hairs when young, glabrous when mature. *Leaves* up to 250×200 mm; lamina glabrous; petiole up to 70 mm long. *Inflorescence* lateral, umbellate cymes, 6–10-flowered; peduncle 20–25 mm long; pedicel ± 5 mm long. *Corolla* ± 7×1,5 mm. *Fruit* 13×17 mm, dull purple-black when ripe; fruit stalk 30–40 mm long; fruiting calyx about 2 mm long. *Seeds* 1×2 mm. 2n=72 (Edmonds 1977).

In Ghana *S. scrabrum* is known only in cultivation. It is grown for its edible leaves. The fruits, though eaten in Europe, where it is known as 'garden huckleberry', do not seem to be eaten in Ghana. It is of African origin, and has spread to America and other continents.

Vouchers: Greater Accra Region: Avenor, fl. & fr. July 1979, *Hall & Bukenya GC 47130*; Legon Botanical Garden (experimental plot), fl. & fr. February 1980, *Bukenya S44* (seed from *GC 47130*); Akligo, fl. & fr. November 1967, *GC 37361*.

Section **Afrosolanum** *Bitter* in Botanische Jahrbücher 54: 420–1, 440 (1917); D'Arcy: 266, 274 (1972).

4a. **Solanum terminale** *Forssk.* subsp. **welwitschii** *(C. H. Wr.) Heine* in Kew Bulletin 14: 248 (1960); Heine: 331 (1963); Gbile: 118 (1979).

S. welwitschii C.H. Wr.: 126 (1894); C.H. Wr.: 213 (1906); Bitter: 478 (1917); Hutch. & Dalz.: 206 (1931).

Slender woody climber. *Leaves* up to 170 × 80 mm; petiole up to 30 mm long. *Inflorescence* terminal, spiciform ; flowers up to 40, in cymules, subsessile on axis. *Corolla* 8–10 mm long with very few simple hairs on outer surface, glabrous on inner surface. *Fruits* globose, ± 10 mm diam.; fruit stalk up to 6 mm long. *Seeds* ± 1,5 × 2,5 mm, smooth.

Subsp. *welwitschii* is fairly well distributed in secondary forest.

Vouchers: Western Region: nr Bibiani, fl. & fr. December 1953, *Adams 2101*. Central Region: nr Manso, Akim, fr. December 1933, *Irvine 2086*. Eastern Region: Kade, fl. & fr. February 1955, *Morton 8387*; Atewa F.R., fr. January 1972, *Lock & Hall GC 43502*. Volta Region: Togo Plateau, fl. April 1953, *Morton 9197*.

4b. **Solanum terminale** *Forssk.* subsp. **inconstans** *(C.H. Wr.) Heine* in Kew Bulletin 14: 247 (1960); Heine: 331 (1963); Gbile: 118 (1979).

S. inconstans C.H. Wr.: 127 (1894); Bitter: 482 (1917); Hutch. & Dalz.: 207 (1931).

S. togoense Dammer: 59 (1905).

S. suberosum Dammer: 182 (1906).

Slender woody climber. *Leaves* up to 100 × 50 mm; petiole up to 18 mm long. *Inflorescence* subracemose, leaf-opposed or in leaf axil, 2–7-flowered; peduncle up to 35 mm long; pedicel ± 15 mm long. *Corolla* 8–10 mm long, with simple hairs on the outer surface, glabrous on the inner surface. *Fruits* spindle-shaped, ± 25 × 10 mm; fruit stalk ± 28 mm long. *Seeds* 1,5 × 2 mm, embedded in a cushion of hairs ± 1 mm long.

Subsp. *inconstans* is a rare taxon, found in disturbed forest. Both subspecies of *S. terminale* are restricted to tropical Africa.

Vouchers: Eastern Region: Kade F.R., fl. October 1972, *Hall GC 43831*. Volta Region: Togo Plateau F.R., fl. & fr. June 1972, *Abbiw GC 43712*.

Subgenus **Brevantherum** *(Seithe) D'Arcy* in Annals of Missouri Botanical Garden 59: 267–274 (1972); D'Arcy: 713 (1973).

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. *Fruits* rather small, 7–20 mm diam.

Section **Brevantherum** *D'Arcy* in Annals of Missouri Botanical Garden 60: 716 (1973).

5. **Solanum erianthum** *D. Don*, Prodromus florae Nepalensis: 96 (1825); D'Arcy: 717 (1973); Gbile: 118 (1979).

S. verbascifolium auct. non L.: Irvine: 733 (1961); Heine: 335 (1963).

Shrub or small tree 4–7 m high; young stem heavily covered with sessile stellate hairs. *Leaves* elliptic-ovate, entire, up to 230 × 180 mm; apex acute, base truncate, oblique or attenuate; both surfaces of leaves bear a heavy covering of stellate hairs with 5–15 arms raised on setae; petiole about 35 mm long. *Inflorescence* terminal, paniculate with numerous flowers. *Flowers* perfect; pedicel ± 5 mm long, bearing more or less sessile stellate hairs with ± 15 arms. *Corolla* 7–9 mm long, bearing sessile stellate hairs on the outer surface, and veins on inner suface. *Calyx* on both sides bearing sessile stellate hairs. *Fruit* spherical, pubescent, ± 8 mm diam., green when young, yellow when ripe; fruit stalk ± 10 mm long. *Seeds* 1 × 1 mm.

S. erianthum is a widespread tropical weed. *S. erianthum* and *S. torvum* form the most abundant shrub seed stock in Ghanian forest soils, with the greatest abundance in the Moist Semideciduous, Dry Semideciduous and Southern Marginal vegetation types. When forests are cut the seeds germinate and these species form the most abundant secondary species. Fruits of *S. erianthum* are believed to be poisonous; leaves are used for healing 'Craw-Craw'.

The closely related species, *S. mauritianum* Scop. and *S. umbellatum* Miller are established elsewhere in Africa (R. N. Lester pers. comm.). These two species however have not yet been recorded for Ghana.

Vouchers: Western Region: Krobo, fr. May 1952, *Boughey, s. n.* Eastern Region: Hweehwee nr Akwaseho, fl. June 1979, *Hall & Buken ya GC 47105*; Kade F.R., Owusu, fr. August 1970, *Annan & Aryeetey GC 53378*. Brong Ahafo Region: Goaso-Ntotroso, fr. April 1968, *Andoh-Ampah 53628*. Volta Region: Akpafu-Mempeasem, fr. January 1950, *Noamesi 64*.

Subgenus **Leptostemonum** *(Dun.) Bitter* in Botanische Jahrbücher 55: 69–89 (1919); D'Arcy: 684 (1973).

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

Section **Acanthophora** *Dun.*, Histoire des Solanum: 131–132 (1813); D'Arcy: 709 (1973).

6. **Solanum mammosum** *L.*, Species plantarum: 187 (1753); D'Arcy 712 (1973); Nee: 576 (1979).

Shrub about 1,5 m high; stem densely clothed with simple hairs ± 2 mm long, and slightly decurved prickles that are 5 mm long, base 2 mm broad. *Leaves* ± 110 × 90 mm, lobed or doubly-lobed, to about ½ 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 both surfaces of leaves mainly simple, on lower surface some stellate hairs 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.

S. mammosum is an introduced plant rarely seen, seemingly not naturalized. It is of South American origin, naturally growing in disturbed habitats. It has spread to other parts of the world as an ornamental plant. Its fruits are poisonous.

Voucher: Ghana, Greater Accra Region: school nursery, Achimota, fl. March 1970, *Doe-Lawson GC 39999*.

7. **Solanum aculeatissimum** *Jacq.*, Icones plantarum: 45 (1781); C.H. Wr.: 228 (1906); Bitter: 148 (1923); Dalziel: 432 (1937); Heine: 535 (1963); Gbile: 115 (1979).

Shrub ± 1,5 m high; stem densely pubescent, with simple hairs 0,1–1 mm long, and decurved prickles up to 12 mm long with base 0,5 mm broad. *Leaves* ±180 × 160 mm; lobed or doubly lobed to ⅓ width of leaf, with 3–4 pairs of major triangular lobes; simple pilose hairs on both surfaces of leaves, rare stellate hairs on underside; prickles on midrib and petiole, slender, ± 15 mm long, base ± 2 mm broad, on primary lateral veins, slender, ± 7 mm long, base 0,8 mm broad. *Inflorescence* 3–6-flowered; petiole, 4–10 mm long. *Corolla* white, ± 12 mm long; peduncle 0–0,5 mm long; pedicel ± 11 mm long. *Fruit* globose, ± 25 mm diam. *Seeds* 3 × 4 mm.

S. aculeatissimum occurs wild in secondary forest, but is rare in Ghana. Ghana material has shorter hairs and less abundant prickles than specimens from the mountains of Sierra Leone and Cameroun. The species is tropical African, found in the tropical zone and in South Africa, but has close relationship to several South American species. All Ghana specimens come from the Western Region.

Vouchers: Western Region: forest clearing, Awaso Sefwi, fl. & fr. December 1953, *Adams 2080*; nr Ebin timber Rd, June 1956, *Enti FH 6440*.

8. **Solanum capsicoides** *All.* in Mélanges de Philosophie et de Mathématique: 64 (1774); Nee: 574 (1979).

S. ciliatum Lam.: 21 (1799); Heine: 334 (1963).

Shrub ± 1,5 m high; stem bearing sparse simple hairs 4–5 mm long, and prickles 2–10 mm long with base up to 2 mm broad. *Leaves* ± 150×135 mm, lobed or doubly-lobed to ⅓–½ width of leaf; lobes 2–3 pairs, ovate; both surfaces with sparse uniform simple pilose hairs; margin ciliate; prickles on midrib ± 13 mm long, base 2 mm broad, on primary and secondary lateral veins 2–7 mm long; petiole up to 50 mm long with simple hairs and prickles 14 mm long with base 2 mm broad. *Inflorescence* ± 4-flowered; pedicel ± 10 mm long. *Corolla* white or pale mauve, ± 12 mm long. *Fruit* globose, ± 45 mm diam. *Seeds* ± 1,5×2 mm, surrounded by a wing ± 2 mm broad.

S. capsicoides has limited distribution in Ghana; apparently introduced into botanical gardens as an ornamental plant; it does not seem to be naturalized. Its origin is South American (Brazil) and it has successfully spread to all continents as a weed with preferred habitat being drier, open lowlands.

Vouchers: Eastern Region: outside Botanical Garden Aburi, fl. & fr. January 1957, *Akpabla 1816*. Greater Accra Region: Legon, fl. & fr. October 1961, *Morton A5008*.

Section **Ischyracanthum** *Bitter* in Feddes Repertorium, Beihefte 16: 142 (1923); D'Arcy: 269, 275 (1972).

9. **Solanum arundo** *Mattei* in Bollettino del R. Orto botanico, Palermo: 188 (1908).

Shrub 1–2 m high; stem bearing stellate hairs; prickles strongly decurved, ± 8 mm long, base up to 5 mm broad. *Leaves* very small with 2 pairs of lobes ± 8 mm long, ± 35 mm wide; base attenuate; small stellate hairs with 6–8 more or less equal arms on both surfaces; prickles on leaves straight, up to 12 mm long, base 3 mm broad; petiole ± 3 m long. *Inflorescence* racemose, opposite a leaf or slightly below; flowers up to 10 or more; pedicels ± 6 mm long, with stellate hairs. *Corolla* violet, ± 13 mm long, with stellate hairs on the inner surfaces, on veins and on the outer surface. *Fruits* spherical, ± 13×12 mm, with more or less decurved stalks ± 14 mm long; young fruits variegated dark and pale green; ripe fruits brownish. *Seeds* 2×2 mm.

S. arundo was probably introduced into Legon Botanical Garden from northern Kenya; it is not naturalized. Its area of concentration is in the drier parts of east tropical Africa. It has also been recorded from the west coast of India.

Voucher: Ghana, Greater Accra Region: Legon Botanical Garden, fl. & fr. October 1958, *Morton A3442*.

Section **Melongena** *Dun.*, Histoire des Solanum: 208–218 (1813); D'Arcy: 698 (1972).

10. **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).

S. edule Schumach. & Thonn.: 125 (1827); Junghans: 91 (1962).

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 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× 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* 3×4 mm.

S. melongena is cultivated for its fruits which are eaten in stew and soup. It is a significant source of income to horticultural farmers especially in the coastal parts of southern Ghana. the species is believed to have originated in Asia (Indo-Burma). It is cultivated on all continents for its edible fruits.

Vouchers: Central Region: Kromantse, fr. June 1979, *Hall & Bukenya GC 47121*. Eastern Region: N of Mankrong (Affram), fr. May 1961, *Morton A4193*. Greater Accra Region: Nungua, fl. July 1979, *Hall & Bukenya GC 47135*; Achimota, fl. Aug. 1927, *Irvine 775*.

11. **Solanum incanum** *L.*, Species plantarum: 188 (1753); C.H. Wr.: 238 (1906); Bitter: 200 (1923); Dalziel: 433 (1937); Heine: 332 (1963); Gbile: 118 (1979).

Shrub 1–1,5 m high; stem with stellate floccose hairs with 8–10 more or less equal arms; prickles ± 4 mm long, base ± 1 mm broad. *Leaves* ± 160×120 mm, margin with 3 pairs of short lobes, middle lobe up to 20 mm long, both surfaces with stellate hairs; prickles on midrib ± 3 mm long, base ± 0,5 mm broad; petiole up to 70 mm long. *Inflorescence* up to 5-flowered; pedicel ± 10 mm long. *Corolla* violet, ± 18 mm long. *Calyx*, especially on the lowermost flower, very prickly, prickles ± 2 mm long. *Fruits* globose, ± 20 mm diam., green with light green patches when young, yellow when ripe.

S. incanum is a rare species in Ghana. It has not been collected since 1956. It is common in drier parts of tropical Africa and India. In Ghana it has been collected from one locality.

Voucher: Greater Accra Region: Nungua beach, roadside, fl. May 1956, *Morton 2086*.

12. **Solanum macrocarpon** *L.*, Mantissa Altera: 205 (1771); C.H. Wr.: 214 (1906); Bitter: 195 (1923); Burkill: 333 (1925); Dalziel: 343 (1937); Heine: 224 (1963).

S. dasyphyllum Schumach. & Thonn.: 126 (1827); Bitter: 188 (1923); Heine: 334 (1963), syn. nov.

S. duplosinuatum Klotzch: 233 (1862); Wright: 243 (1906); Hutch. & Dalz.: 207 (1931).

S. thonningianum Jacq.: 123 (1811–16); Junghans: 91 (1962).

S. atropo Schumach. & Thonn.: 124 (1827).

S. zanoni Gouan (1773) Gouan: 7 (1773).

Subshrub or shrub, 0,5−1,5 m high; stem terete, glabrous or with stellate hairs more or less sessile or on robust setae up to 2 m long. *Stem* not prickly or with straight, robust prickles up to 6 mm long, base up to 3 mm broad. *Leaves* 150−460 × 80−300 mm, entire or with short lobes ± 10 mm long to deeply doubly-lobed with major lobes up to 70 mm long; young leaves bear on upper surface (especially on veins) simple, branched or stellate hairs on setae up to 2 mm long, either singly or in combination; lower surface with branched, stellate hairs on robust setae 0,5−2 mm long and/or more or less sessile stellate hairs; leaf margin of young leaves with stellate hairs on robust setae up to 2 mm long or short-stalked glandular hairs; *mature leaves* glabrous or with simple hairs and stellate hairs on setae up to 2 mm long, upper surface with sessile stellate hairs; lower surface with stellate hairs on setae up to 2 mm long or sessile; leaf margin with stellate hairs on setae up to 2 mm long, sessile stellate hairs, branched or simple hairs; prickles present or absent on leaves, when present, principally on midrib and lateral veins, on mature leaves prickles on midrib and primary lateral veins straight, up to 13 mm long, base ± 3 mm broad, on secondary and tertiary lateral nerves up to 7 mm long, base 1 mm broad; leaf subsessile or with petiole up to 70 mm long. *Inflorescence* lateral, racemose, 3−12-flowered, the lowermost flower or flowers hermaphrodite, bigger than the rest, distal flowers with short styles, functionally male, normally 1−2(−3) hermaphrodite plus 1−3 functionally male flowers present. *Corolla* infundibuliform-rotate or campanulate-rotate, 20–35 mm long, white, light purplish or blue, the outer surface with simple, sessile stellate hairs or short-stalked or sessile glandular hairs, inner surfaces glabrous. *Calyx* not prickly or with prickles up to 10 mm long; outer surface with sessile stellate hairs, stellate hairs on setae up to 2 mm long, simple hairs or short-stalked glandular hairs; fruiting calyx often accrescent, 15−110 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; fruit stalk erect or decurved, 10−40 mm long. *Seeds* 3−3,5 × 2−3 mm.

The *S. macrocarpon* complex is extremely variable. In Ghana it is cultivated mainly for its leaves, especially of plants with glabrous leaves. Leaves that are prickly have to be de-prickled before cooking. The fruits are also eaten. In other parts of Africa, e.g. E Africa, it is less cultivated. It is a native species of Africa from where it has been introduced to other parts of the world. It occurs in almost every region of Ghana.

Vouchers: Western Region: Nkwanta, Ankasa G.P.R., fl. & fr. January 1980, *Hall GC 471680*. Ashanti Region: Abodon, fr. June 1979, *Hall & Bukenya GC 4711*. Central Region: Anyam Main, fl. & fr. June 1979, *Hall & Bukenya GC 47122*. Eastern Region: Hweehwee nr Akwaseho, fl. & fr. June 1979, *Halt & Bukenya GC 47103*; Kade, fl. & fr. January 1980, *Hall GC 471679*. Brong Ahafo Region: Bui Nat. Park, fl. & fr. July 1976, *Hall & Swaine GC 46122*. Greater Accra Region: Achimota, fl. May 1958, *Akpabla 1783*; Sapreiman, fl. & fr. July 1979, *Hall & Bukenya GC 47128*.

13. **Solanum wrightii** *Benth.* in Flora Hongkongensis: 243 (1861); Bitter: 180 (1923); Heine: 248 (1960); Irvine: 733 (1961); Heine: 335 (1963); Gbile: 119 (1979).

Small tree up to 5 m high; stem bearing prickles, and stellate hairs on setae ± 1 mm long. *Leaves* ± 250 × 200 mm, with 2−3 pairs of prominent lobes up to 80 mm long; upper surface bearing simple hairs ± 1 mm long, lower surface with stellate hairs with 5−8 unequal arms on setae ± 0,5 mm long; prickles on midrib 10−20 mm long, base 4 mm broad; petiole ± 60 mm long; prickles on petiole up to 20 mm long, base 4 mm broad. *Inflorescence* ± 6-flowered; pedicel ± 20 mm long. *Corolla* blue to violet, up to 30 mm long. *Fruit* globose, green when young with light green patches, yellow when ripe.

S. wrightii is a decorative introduced tree; a native of Bolivia, it has been introduced to other tropical areas of the world.

Vouchers: Ghana, Greater Accra Region: Cadbury House 8, Achimota, fl. 1935, *Bannerman s. n.*; Hort. Nursery, Achimota, fl. January 1958, *Akpabla 1860*.

Section **Oliganthes** *Bitter* in Feddes Repertorium, Beihefte 16: 1 (1923); D'Arcy: 272 (1972).

14. **Solanum anguivi** *Lam.* in Tableau Encyclopédique et Méthodique: 23 (1794); Hepper: 287−292 (1978).

S. indicum L. subsp. *distichum* (Schumach. & Thonn.) Bitter 13 (1923); Heine: 333 (1963); Irvine 73 (1961); Hepper: 121 (1976); Gbile: 116 (1979).

S. indicum auct. non L.

S. anomalum auct. non Thonn.

Shrub 1,5−3 m high; stem bearing small, sessile stellate hairs with 4−8 more or less equal arms; sometimes prickly. *Leaves* elliptic-ovate, 100−200 × 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; leaves bear on both surfaces but nore so on the lower, more or less sessile stellate hairs with 6−10 more or less equal arms; petiole 20−60 mm long, with dense stellate hairs. *Inflorescence* a raceme-like cyme, occasionally flowers solitary, extra-axillary, many-flowered, 5 to more than 15, flowers mostly hermaphrodite, occasionally the distal flowers with short styles, functionally male; peduncle 0−3−6 mm; pedicel 10−15 mm long, bearing stellate hairs. *Corolla* ± mm long, white, occasionally with light purple veins on the outer surface; with stellate hairs outside, more or less glabrous on inner surface. *Fruit* 7−12 × 8−12 mm, mostly globose, smooth, green when young, red when ripe; fruit stalk 8−15 mm long, usually erect, occasionally horizontal or decurved. *Seeds* 1,5−2,1 mm long by 1,9−2,9 mm wide.

S. anguivi is widely distributed in Ghana, either wild or as a semicultivated plant for the fruits which are bitter and cooked in stew. The soup is taken before a meal as an appetiser. The species is widely distributed throughout Africa as a semicultivated plant or as a weed in varying ecological situations. In Ghana it is found in all the regions.

Vouchers: Western Region: Tonton F. R. (cleared area), fr. May 1956, *Enti FH 6095*. Ashanti Region: Abodon, fl. & fr. June 1979, *Hall & Bukenya GC 47113*; Drobo, fl. & fr. April 1958, *Morton A3228*. Eastern Region: Aburi, fl. & fr. April 1899, *Brown 320*; Ajena

to Gyakiti Rd, fl. & fr. October 1953, *Morton s. n.* Brong Ahafo Region: nr Menje, fl. & fr. December 1956, *Morton A2609*. Volta Region: Akpafu Mempeasem, fl. & fr. 1956, *Noamesi 68*. Greater Accra Region: Achimota, fl. & fr. June 1932, *Irvine 1770*; fl. & fr. March 1954, *Morton GC 25400*.

15. **Solanum aethiopicum** *L.*, Amoenitates academicae: 307 (1759); Dalziel: 432 (1937); Heine: 332 (1963); Gbile: 115 (1979).

Subshrub, about 0,6 m high; stem glabrous. *Leaves* ovate, about 120 × 90 mm, apex acute, base oblique, attenuate or truncate; margin repand; young leaves bear on both surfaces small, sessile stellate hairs with 5–8 more or less equal arms; mature leaves subglabrous; petiole 50–60 mm long. *Inflorescence* 2–3-flowered, sessile or flowers solitary, lateral; *flowers* hermaphrodite; pedicel ± 7 mm long with scattered stellate hairs. *Corolla* white, 5–6 mm long, glabrous; flower buds with dense stellate hairs; style also with stellate hairs. *Calyx* as long as the corolla tube. *Fruit* globose ± 18 mm diam., green with dark green stripes when young, shine red when ripe; fruiting calyx ± 7 mm long; stalk up to 12 mm long. *Seeds* 2,8 × 3 mm.

S. aethiopicum is occasionally cultivated by immigrants from Togo in southern Ghana for its leaves which are used as a vegetable. In other parts of tropical Africa, it is more frequently cultivated. Lester & Niakan (1986) treat it as *Solanum aethiopicum* Shumach group. In Ghana it was collected from one locality.

Vouchers: Greater Accra Region: Sarpeiman, fl. July 1979, *Hall & Bukenya GC 47131*; fl. & fr. July 1979, *Hall GC 47129*.

16. **Solanum gilo** *Raddi* in Atti della Società Italiana delle Scienze Modena: 31 (1920); Bitter: 48 (1923); Hepper: 121 (1976); Gbile: 116 (1979).

S. integrifolium auct. non Pior.: Nsowah: 61 (1969).

Shrub 1–2 m high; stem bearing tiny sessile stellate hairs of 4–5 more or less equal arms. *Leaves* elliptic-ovate, 100–240 × 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 more or less sessile stellate hairs with 7–9 unequal arms; petiole 15–80 mm long; prickles may occasionally be present on early leaves. *Flowers* usually solitary or two next to each other, rarely 2–5 or more arising from a common stalk, extra-axillary and hermaphrodite. *Corolla* ± 15 mm long, white, occasionally light purple; petal tips apiculate, incurved; inner and outer surface of corolla with stellate hairs. *Fruit* ellipsoid, globose or oval, 13–70 × 13–50 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 × 4 mm.

S. gilo is by far the most widely cultivated species of *Solanum* throughout the forest zone of Ghana. Its fruits are used in soup or stew preparation. It is preferred to *S. melongena* because it has firmer flesh than the latter. Where these two species are grown together sterile natural hybrids occur.

The type specimen was collected from Brazil, but the species must have been introduced into South America from Africa. The Brazilian vernacular name, 'gilo', was adopted as the specific epithet. The same vernacular name has been recorded for the species in Angola, suggesting that Angola may well have been the source of the Brazilian plants. *S. gilo* has subsequently been introduced to other parts of the world. Lester & Niakan (1986) treat it as *Solanum aethiopicum* L. Gilo group.

Vouchers: Ashanti Region: Abodon, fl. & fr. June 1979, *Hall & Bukenya GC 47116*. Eastern Region: Hweehwee nr Akwaseho, fl. & fr. June 1979, *Hall & Bukenya GC 47127*. Volta region: Ashiagborvi, nr Tadzevu, V/R, fl. & fr. August 1979, *Hall GC 47150*. Greater Accra Region: Legon, fl. & fr. December 1979, *Hall & Bukenya GC 47116, GC 47117, GC 47118*.

Section **Torva** *Nees* in Transactions of the Linnean Society: 51 (1834); D'Arcy: 273 (1972).

17. **Solanum torvum** *Swartz*, Prodromus: 47 (1788); Wright: 231 (1906); Bitter: 252 (1921); Dalziel: 435 (1937); Irvine: 732 (1961); Heine 335 (1963); D'Arcy: 708 (1973); Hossain: 293 (1973); Gbile: 118 (1979).

Shrub about 2 m high; stem bearing stellate hairs and prickles up to 8 mm long and 7 mm broad. *Leaves* up to 160 × 150 mm; margin subentire or distinctly lobed with 2–3 pairs of lobes; lobes up to 50 mm long; base oblique, attenuate or subcordate; young leaves with dense, stalked stellate hairs on both surfaces; mature leaves on upper surface with more or less sessile, stellate hairs, 4–6 armed with one arm much longer than the rest; lower surface with stalked stellate hairs of 8–9 more or less equal arms; petiole up to 70 mm long. *Inflorescence* a corymbose cyme; lateral, distal flowers with short styles, functionally male; peduncle ± 3 mm long; pedicel ± 7 mm long, bearing glandular hairs. *Corolla* white, 10–12 mm long, outer surface bearing sessile stellate hairs, 6–7-armed with one arm much longer than the rest, glabrous within. *Calyx* ± 4 mm long, lobes triangular, bearing glandular and sessile, 7–8-armed stellate hairs on the outer surface, glabrous on the inner surface. *Fruit* globose, 10–15 mm diam., yellow when ripe; fruit stalk up to 20 mm long.

S. torvum is a common weed throughout the tropics. Its fruits are collected in some parts of Ghana and eaten in soup and stew. *S. torvum* has a wide distribution in Ghana.

Vouchers: Ashanti Region: Abodon, fr. June 1979, *Hall & Bukenya GC 47112*; Ashanti, fl. & fr. July 1953, *Antenson s. n.* Central Region: Abura nr Cape Coast, fl. September 1962, *Hall 2343*. Eastern Region: Hweehwee nr Akwaseho, fr. June 1979, *Hall & Bukenya GC 47101*; Bosuso, fl. & fr. January 1939, *Akpabla 447*. Volta Region: nr Bishop Herman College Kpandu, fl. & fr. December 1973, *Veldkamp 6086*. Greater Accra Region: Legon Hill, fl. & fr. October 1955, *Adams 3371*.

18. **Solanum anomalum** *Thonn.*, Beskrivelse af guineiske planter: 126 (1827); Bitter: 273 (1921); Dalziel: 443 (1937) Irvine: 732 (1961); Heine: 332 (1963); Gbile: 115 (1979).

Shrub; stem glabrous; prickles about 5 mm long with base 4 mm broad. *Leaves* sinuate, up to 170 × 80 mm; base attenuate; young leaves bear on both surfaces a dense covering of small sessile stellate hairs with 4–6 more or less equal arms; mature leaves glabrous; petiole 30–60 mm long. *Inflorescence* subfasciculate, in leaf axils; peduncle ± 2 mm long; pedicel ± 6 mm long, bearing small sessile stellate hairs. *Flowers* hermaphrodite. *Corolla* white, 5–6 mm long, with stellate hairs on the outer surface, inner surface glabrous. *Calyx* ± 5 mm

long, bearing small sessile stellate hairs on the outer surface, glabrous within. *Fruit* spherical, ± 6 mm diam., green when young, red when ripe. *Seeds* 2 × 2,5–3 mm.

S. anomalum occurs wild in thickets and secondary forest in the drier parts of the forest zone. It seems to be restricted to West Africa.

Vouchers: Western Region: Busua Bay, fl. & fr. May 1956, *Morton A2113*. Ashanti Region: Sunyani Sec. forest, fr. June 1956, *Bossman Osei 42*. Central Region: Cape Coast, *Hall 548*. Eastern Region: Aburi Scarp, fl. & fr. November 1955, *Morton A1755*. Volta Region: Volta Gap, fl. & fr. October 1953, *Morton s. n.* Greater Accra Region: Legon, fr. August 1979, *Hall GC 47134*.

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

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 the base or above it. *Fruits* 10–20 mm diam.

Section **Potatoe**

19. **Solanum tuberosum** *L.*, Species plantarum: 185 (1753); D'Arcy: 752 (1973).

Herb ± 0,5 m high; stem with shallow grooves when dry, and simple hairs. *Stolons* tuberiferous. *Leaves* compound, interceptedly imparipinnate; major leaflets 5–7, alternating with ± 3 pairs of minor leaflets. *Leaflets* elliptic to oblong-elliptic, ± 50 × 25 mm; simple hairs on both surfaces; subsessile, margin entire; petiole up to 60 mm long. *Inflorescence* paniculate, with up to 10 flowers; pedicel 12–15 mm long with simple hairs, terminal on long peduncle ± 80 mm long. *Flowers* hermaphrodite. *Corolla* white, 10–12 mm long. *Calyx* ± 7 mm long, with simple hairs on the outer surface, glabrous within. *Fruits* globose, about 7 mm diam.

S. tuberosum, the Irish potato, is a mainly temperate crop introduced to Ghana at about the time of the Second World War. First introduced at Mampong (Ashanti Region), its cultivation was only slowly taken up by the inhabitants of the area. Potato farming was therefore taken over by the Ministry of Agriculture, which grew it on big farms. The project was however abandoned. The crop spread to other areas. The present major potato growing areas are Pepease (Eastern Region) and Amedzofe (Volta Region), where it is grown early in the major rainy season by individual farmers and co-operatives. Potato is grown for its stem tubers, 90% of which are consumed by foreigners.

S. tuberosum had its origin in the Andes (Bircher 1960). It was introduced to Europe, from where it spread to other parts of the world. The Ghana herbarium has not many collections of *S. tuberosum*.

Voucher: Volta Region: Kpoeta, fl. August 1946, *Sape s. n.*

Section **Jasminosolanum** *Bitter ex Seithe* in Botanische Jahrbücher 81,3: 291 (1962); D'Arcy: 757 (1973).

20. **Solanum seaforthianum** *Andr.* var. **disjunctum** *O. E. Schulz* in Symbolae Antillanae: 169 (1909); Bitter: 309 (1923); Irvine: 732 (1961); Heine: 332 (1963); D'Arcy: 758 (1973); Gbile: 117 (1979).

Woody climber; stem terete, glabrous. *Leaves* compound, imparipinnate to deeply pinnatifid with about 7–9 leaflets or lobes; leaflets up to 50 × 30 mm, elliptic; lower leaflets with a more or less 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 about 20 flowers; pedicel up to 7 mm long. *Flowers* hermaphrodite. *Corolla* blue to violet, up to 10 mm long. *Fruits* spherical, ± 10 mm diam., red when mature; up to 20 from an inflorescence; fruit stalk 10–14 mm long. *Seeds* 2 × 2 mm.

S. seaforthianum is an introduced decorative climber seemingly not yet naturalized. Its native home is central America and the West Indies. It has spread to many parts of tropical Africa where it has been introduced for decorative purposes. The species has been recorded in Ghana.

Vouchers: Greater Accra Region: Achimota, fl. February 1931, *Easmon 11*; fl. & fr. April 1937, *Onyeama 17*; fl. March 1954, *Anteson s. n.*

DISCUSSION AND CONCLUSIONS

In Ghana, the most widespread *Solanum* species are *S. torvum*, *S. aethiopicum* Gilo group, *S. nigrum s. l.* and *S. terminale* subsp. *welwitschii*. On the other hand, the *S. aethiopicum* Shumach group, *S. scabrum*, *S. incanum*, *S. capsicoides* and *S. aculeatissimum* have restricted occurrence.

Although some species are constant, for example *S. torvum*, *S. erianthum* and *S. aethiopicum* Gilo group, others are not. In cultivation, the *S. macrocarpon* complex, for instance shows great variability. Bukenya & Hall (1987) identified, named and described six cultivars of the *S. macrocarpon* complex in Ghana. Bukenya 1980 (in unpublished M.Sc. thesis) studied experimentally the *S. macrocarpon* complex and proposed to sink *S. dasyphyllum* under *S. macrocarpon*. In our description of the *S. macrocarpon* complex, the former is therefore listed as a synonym of the latter. The classification and nomenclature of the infraspecific categories of the *S. macrocarpon* complex need to be revised.

A detailed study of the *S. nigrum* complex is required before the numerous specimens belonging to this complex of species, available at the Legon herbarium, can be sorted out.

Experimental work on the difficult species of the genus has been recommended by Bitter (1923), Hawkes *et al.* (1979) and Edmonds (1979) as necessary to contribute to the improvement of the taxonomy of *Solanum*. Cross breeding experiments have thrown some light on the taxonomy of the genus. Omidiji (1979) and Lester & Niakan (1986) for example, obtained fully fertile hybrids from crosses involving *S. gilo* and *S. aethiopicum*. The chemotaxonomic study by Pearce & Lester (1979) points to a very close relationship between *S. melongena* and *S. anguivi*. This has raised doubts as to the specific limits within the above sets of taxa.

We agree with Heine (1963) that a modern revision of the entire genus is long overdue.

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REFERENCES

BENTHAM, G. 1861. *Flora Hongkongensis: a description of the flowering plants and ferns of the island of Hong Kong*. Lovell Reeve, London.

BIRCHER, W. H. 1960. *Gardens of the Hesperides*. The Anglo-Egyptian Bookshops, Cairo.

BITTER, G. 1913. Solana Africana 1. *Botanische Jahrbücher* 49: 560–569.

BITTER, G. 1917. Solana Africana 2. *Botanische Jahrbücher* 54: 416–506.

BITTER, G. 1919. The papuasischen Arten von *Solanum*. *Botanische Jahrbücher* 55: 69–89.

BITTER, G. 1921. Solana Africana 3. *Botanische Jahrbücher* 57: 248–286.

BITTER, G. 1923. Solana Africana 4. *Feddes Repertorium, Beihefte* 16: 1–320.

BUKENYA, Z. R. & HALL, J. B. 1987. Six cultivars of *Solanum macrocarpon* L. (Solanaceae) in Ghana. *Bothalia* 17: 91–95.

BURKILL, I. H. 1925. *Solanum macrocarpon*. *Kew Bulletin* 1925: 333–341.

DALZIEL, J. M. 1937. *The useful plants of west tropical Africa*. Crown Agents, London.

DAMMER, U. 1905. Solanaceae africanae. *Botanische Jahrbücher* 38: 57–60.

DAMMER, U. 1906. Solanaceae africanae I. *Botanische Jahrbücher* 38: 176–195.

D'ARCY, W. G. 1972. Solanaceae studies 2. Typification of subdivisions of *Solanum*. *Annals of the Missouri Botanical Garden* 59: 262–278.

D'ARCY, W. G. 1973. Solanaceae. In R. E. Woodson Jr, R. W. Schery & collaborators, Flora of Panama. *Annals of the Missouri Botanical Garden* 60: 573–780.

DON, D. 1825. *Prodromus florae Nepalensis; sive enumeratio vegetabilium, quae in itinere per Nepaliam ....*, Londini.

DUNAL, M. F. 1813. *Histoire Naturelle, Médicinale et Economique des Solanum*. Paris, Strasbourg, Montpellier.

EDMONDS, J. M. 1971. *Solanum* L. In W. T. Stearn, Taxonomy and nomenclatural notes on Jamaican gamopetalous plants. *Journal of the Arnold Arboretum* 52: 634–635.

EDMONDS, J. M. 1972. A synopsis of the taxonomy of *Solanum* sect. *Solanum* (Maurella) in South America. *Kew Bulletin* 27: 95–114.

EDMONDS, J. M. 1977. Taxonomic studies on *Solanum* sect. *Solanum* (Maurella). *Botanical Journal of the Linnean Society* 75: 141–178.

EDMONDS, J. M. 1979. Taxonomic studies of *Solanum* sect. *Solanum* (Maurella). *Linnean Society Symposium* 7: 529–548.

EPENHUIJSEN, V. M. VAN. 1974. *Growing native vegetables in Nigeria*. FAO, Rome.

GBILE, Z.O. 1979. *Solanum* in Nigeria. *Linnean Society Symposium* 7: 113–120.

GOUAN, A. 1773. *Illustrationes et observationes botanicae*. Zürich.

GRANT, V. 1971. *Plant speciation*. Columbia University Press, New York.

GRAY, J. M. 1968. *The taxonomy of the Maurella section of the genus* Solanum *L. within South America*. Ph. D. thesis, University of Birmingham, England.

HAWKES, J. G., LESTER, R. N. & SKELDING, A. D. (eds). 1979. *The biology and taxonomy of the Solanaceae*. *Linnean Society Symposium* 7: 1–738.

HEINE, H. 1960. Notes on *Solanum*. *Kew Bulletin* 14: 248.

HEINE, H. 1963. Solanaceae. In F. N. Hepper, *Flora of west tropical Africa* 2,2: 325–335. Crown Agents, London.

HEPPER, F. N. (ed.) 1963. *Flora of West tropical Africa*, edn 2,2. Crown Agents, London.

HEPPER, F. N. 1976. *The West African herbaria of Isert & Thonning*: a taxonomic revision and index to the IDC microfiche. Bentham-Moxon Trust, Kew.

HEPPER, F. N. 1978. Typification and name changes of some Old World *Solanum* species. In J. G. Hawkes, Systematic notes on the Solanaceae. *Botanical Journal of the Linnean Society* 76: 287–292.

HEPPER, F. N. 1979. On typifying Linnaean names of Solanaceae. *Linnean Society Symposium* 7: 131–134.

HOSSAIN, M. 1973. Observations of stylar heteromorphism in *Solanum torvum* Swartz (Solanaceae). *Botanical Journal of the Linnean Society* 66: 291–301.

HUTCHINSON, J. & DALZIEL, J. M. (eds) 1931. *Flora of west tropical Africa*, edn 2. Crown Agents, London.

IRVINE, F. R. 1961. *Woody plants of Ghana, with special reference to their uses*. Oxford University Press, London.

JACQUIN, J. F. L. B. DE 1811–16. *Eclogae plantarum rariorum aut minus cognitarum* 1: 123–125. Strauss, Vienna.

JUNGHANS, J. 1962. *Thonning's and Isert's collections from 'Danish Guinea' (Ghana) in west tropical Africa:* 91. University of Copenhagen.

KHAN, R. 1979. *Solanum melongena* and its ancestral forms. *Linnean Society Symposium* 7: 629–636.

LAMARCK, J. B. A. P. M. DE 1794. *Tableau Encyclopédique et Méthodique* 2: 2–31. Paris.

LESTER, R. N. & NIAKAN, L. 1986. Origin and domestication of the scarlet eggplant (*S. aethiopicum* L., from *S. anguivi* Lam.). In W. G. D'Arcy, *Solanaceae: biology and systematics*: 433–456. Columbia University Press, New York.

LINNAEUS, C. 1753. *Species plantarum*. 2 vols, Stockholm.

LINNAEUS, C. 1754. *Genera plantarum*, 5th edn, Stockholm.

LINNAEUS, C. 1759. *Amoenitates academicae*. Stockholm.

LINNAEUS, C. 1771. *Mantissa plantarum altera*. Stockholm.

MILLER, P. 1768. *The gardener's dictionary*, 8th edn, London.

NEE, M. 1979. Patterns in biogeography in *Solanum* section *Acanthophora*. *Linnean Society Symposium* 7: 569–580.

NSOWAH, G. F. 1969. Genetic variation in local and exotic varieties of garden eggs (egg plant); variation in morphological and physiological characters. *Ghana Journal of Science* 9: 61–73.

OMIDIJI, M. O. 1979. Crossability relationships between some species of *Solanum*, *Lycopersicon* and *Capsicum* cultivated in Nigeria. *Linnean Society Symposium* 7: 599–604.

PEARCE, K. & LESTER, R. N. 1979. Chemotaxonomy of the cultivated egg plant: a new look at the taxonomic relationships of *Solanum melongena* L. *Linnean Society Symposium* 7: 615–627.

SCHULZ, O. E. 1909–10. Solanacearum genera nonnulla. In *Symbolae Antillanae* 6: 140–279. Leipzig.

SCHUMACHER, C. F. & THONNING, E. 1827. *Beskrivelse af guineiske planter som ere fundre af Danske botanikere*.

SEITHE, A. 1962. Die Haararten der Gattung *Solanum* L. und ihre taxonomische Verwertung. *Botanische Jahrbücher* 81,3: 261–336.

SWARTZ, O. P. 1788. Nova genera et species plantarum. In *Prodromus*. Holmiae, Upsaliae & Aboae.

WRIGHT, C. H. 1894. Solanaceae. *Kew Bulletin* 1894: 126–129.

WRIGHT, C. H. 1906. Solanaceae. In W. T. Thistleton-Dyer, *Flora of tropical Africa* 4: 207–261. Reeve, London.

WRIGHT, J. M. 1975. *Gross morphological studies of four species of* Solanum *L. occurring in Cape Coast District of Ghana*. University of Cape Coast.