

# PROVISIONAL KEY TO THE PLANTS OF THE CENTRAL RANGELANDS

This is a first attempt at a key to the vascular plants of Somalia's Central Rangelands (Hiiraan, Galgaduud and Mudug Regions). Vegetative features are emphasized, for this is intended as a practical key for field as well as lab use (though it would be going too far to construct a key for dry-season application to the myriad deciduous shrub taxa). Reproductive features are the joy of taxonomists but the despair of ecologists. More often than not, neither flower nor fruit can be found on a plant being scrutinized by the field biologist, and when present give trouble by their relatively complicated morphology. Furthermore, taxonomists are loath to accept sterile plant material; again and again they emphasize the need for flowers &/or fruit, and sometimes consider sterile specimens quite useless.

Field biologists therefore need an independent means of identifying plants, one that uses easily observed field character and does not rely on the methods of taxonomists. I have accordingly tried to exclude flowers and fruit from the pool of critical diagnostic characters in the key, and have relied on features of the sterile plant discernible to the naked eye or a 10x lens. Leaf features are the most important, but many other vegetative characters play a significant role in plant diagnosis. Where used, reproductive characters have a corroborative function or are so reliably encountered in the field that their presence in the key is an aid and not wishful thinking.

The Gramineae and Cyperaceae form a major exception to this vegetative system of diagnosis. The key emphasizes the grass and sedge inflorescence; vegetative features are definitely secondary in importance. Constructing a vegetative key to graminoids is well within the realm of possibility and such keys exist for grass floras larger than Somalia's (e.g. the U.S. Northwest). But the need for such a key is not urgent in the Central Rangelands. If the inflorescence is missing from a given plant in situ, it may be sought in neighboring specimens. For the first go-around in his study area, the investigator may wish to wait until the wet season when inflorescences are common. Working within circumscribed habitats and plant communities, one can usually soon differentiate most of the graminoid species. Grass and sedge diversity is fairly low in the CR, and with a little practice one can confidently name even sterile clones in the field, once the initial matchups have been done with fertile material.

The Somali National Herbarium (MOG) holdings and FTEA series were the main information sources on plant characters. The small size of the MOG collection, an average of only 3.3 sheets per species, and the absence of many species especially of those described by Chicovenda have frustrated my efforts at a 'clean' key. I certainly cannot guarantee that all plants will key out correctly, but I am confident that these keys will be a definite aid to plant identification in the Central Rangelands.

## KEY TO GROUPS

- 1 Plant armed with spines on stem, leaves or floral bracts, or with spinelike twigs (pseudospinose); excludes stinging plants & those with spines on fruit alone.
- 2 Leafless succulents (leaves, if any, ephemera & mostly <3 mm long), almost all with milky sap. GROUP A
- 2 Leaf-bearing plants (leaves mostly >3 mm long), rarely succulent & if so sap not milky.
- 3 Leaves simple or apparently simple (1-fol) [ or 3-fol but lateral pair several times smaller than middle leaflet -NEC? ].
- 4 Spines single along stems, or twigs pseudospinose; leaves armed in some cases (spine-tipped possibly in *Besleria*, *berbericoides*, *Maytenus* spp & *Lawsonia inermis*; spines on midrib & petiole in some *Solanum* spp.) GROUP B
- 4 Spines in pairs or >2 together along stems, &/or leaves or leaflike floral bracts armed. GROUP C
- 3 Leaves compound.
- 5 Leaves simply compound (2- or 3-foliate or pinnate). GROUP D
- 5 Leaves doubly compound (bipinnate). GROUP E
- 1 Plant unarmed (at most with slightly sharp prickles on stem or leaf apex but by no means painful to touch; or only fruit armed).
- 6 Tendrils present. GROUP F
- 6 Tendrils absent though stems may twine.
- 7 Leaves (almost) always absent, or averaging <3 mm long. GROUP G
- 7 Leaves present (though predominantly deciduous), & all or most >3 mm long.
- 8 Leaf with a sheathing lower portion, or enclosed at its base by a closed or overlapping sheath at least 1 mm long.
- 9 Plants grasses or grasslike (graminoids); flowers minute. GROUP H
- 9 Plants not grasslike; flowers often showy or at least conspicuous. GROUP I
- 8 Leaf sheath 1 mm or less or lacking, though stipules or

membranous scales may be present.

- 10 Leaf surface or at least margin very rough. GROUP J
- 10 Leaf surface & margin smooth or only slightly rough.
- 11 Plant with succulent or strongly subsucculent stem &/or leaves. GROUP K
- 11 Plant not succulent though leaves may be leathery.
- 12 Leaves compound.
- 13 Leaves palmate or doubly compound. GROUP L
- 13 Leaves pinnately simply compound or 3-fol.
- 14 Terminal leaflets paired (paripinnate); leaflets all in pairs. GROUP M
- 14 Terminal leaflet single (imparipinnate), lateral leaflets in pairs or alternate.
- 15 Leaflets strictly 3. GROUP N
- 15 Leaflets never exclusively 3. GROUP P
- 12 Leaves simple (or apparently so).
- 16 Leaves opposite, if fascicled then at least some leaf pairs present on the plant.
- 17 Blade margin crenate-serrate. GROUP Q
- 17 Blade margin entire.
- 18 Stem hairy at least toward apex. GROUP R
- 18 Stem glabrous. GROUP S
- 16 Leaves alternate, fascicled, or whorled, never in (strict) pairs.
- 19 Blade lobed or dissected. GROUP T
- 19 Blade unlobed though margin may be crenate-serrate.
- 20 Margin of blade crenate-serrate.
- 21 Main veins 3-7 or more from blade base. GROUP U
- 21 Main vein only 1 from blade base, if >1 then midrib much more prominent than laterals. GROUP V

20 Margin of blade entire though may be wavy.

22 Leaves scaly, stellate-puberulent, glandular  
or mealy.

GROUP W

22 Leaves glabrous or hairy (hairs can be bifid)  
but with none of the above features.

23 Blade with at least some hairs.

24 Blade felty (at least underside).

GROUP X

24 Blade hairy but not soft-felty (at least not  
when mature).

GROUP Y

23 Blade glabrous.

GROUP Z

## GROUP A - ARMED LEAFLESS\* SUCCULENTS

(also *Euphorbia* sp. = Hemming SRS 167/1)

1. Spines long, (1)2.5-7 cm, at least some >3 cm in length; robust succulents forming dense clumps 1-3(5) m tall.
2. Sap milky; stems more or less round in outline, with 3-5 wings or ridges; spines strictly in pairs.
3. Stems 3-angled, deeply winged. *Euphorbia breviararticulata*
3. Stems 4-5 angled, not deeply winged but moderately ridged. *Euphorbia longispina*
2. Sap not milky; stems composed of flat pads with narrow joints; spines 1-5 together. *Opuntia ficus-indica*
1. Spines short, 0.1-1.5(3) cm; smaller succulents (except *Euphorbia robecchii*), tending to creep or scramble.
4. Spines strictly in pairs.
5. Spine-bearing shields connected into 3-7 hard continuous ridges (usually) of a different color from the stem (if the stem can be seen between adjacent ridges), or shield with a long strap-shaped base reaching the next shield down.
6. Stems stout, erect; spines 0.3-1.5 cm. *Euphorbia nigrispina*
6. Stems slender, snakelike, tending to scramble or climb; spines (1) cm, tending slightly downward-directed or downcurved.
7. Spines c4-9 mm, straight or slightly downcurved, tip may be abruptly hooked. *Euphorbia migiurtinorum*
7. Spines 1-3(5) mm, straight to strongly downcurved, tip not hooked.
8. Ridges pinkish-brown or pinkish-gray, spines 1-2.5 mm. *Euphorbia cryptospinosa*
8. Ridges very pale gray to charcoal or purplish, spines 1-3(5) mm; sometimes greenish-yellow stem shows between ridges. *Euphorbia erlangeri*
5. Spine-bearing shields unconnected, or contiguous but the strap-like base short or obsolete.
9. Spines sparse; plant erect & usually >0.5m tall, grows into a tree; spines 3-8(10) mm. *Euphorbia robecchii*
9. Spines generally strongly overlapping, plant therefore heavily armed, usually low (prostrate to cushionlike); spine shields usually contiguous & forming a complete cover over the stem, but can sometimes be (well) separated.
10. Spines 0.3-1.5 cm.
11. Plant puberulent; spines on wrinkled, laterally elongated contiguous shields. *Euphorbia* n.sp. aff. *multiclava*
11. Plant glabrous (may seem puberulent in *E. 'perarmata'*), spines on bulbous or domelike base, both spine & base very pale (blue-)gray. *Euphorbia inaequispina*
10. Spines 1-3 cm. *Euphorbia* n.sp. aff. *fascicularis*
4. Spines 3 or more together, or single.
12. Sap not milky; spines single. *Kleinia subulifolia*

\*Some may briefly, rarely bear a few leaves, or leaves (3 mm long.

12. Sap milky; spines in clusters of 3 or more.

13. Spine grouping a cluster of 4-5 stellate spines each 1-2mm long, on numerous fleshy pegs 0.5-1 cm high.

*Monadenium stellatum*

13. Spine groupings consist of a pair of 1-3(8) mm prickles, & a 0.5-4 cm central spine which is simple or branched; shields with strap-like lower portion, connected only in *Euphorbia glochidiata*.

14. Central spine simple; spines slender, central one (1mm diam. at base; spine 1.5-3 cm.

*Euphorbia* n.sp. aff. *triaculeata*

14. Central spine forked, occasionally simple or 3-branched.

15. Spine forked (more or less) equally, each fork 1-3 mm, straight or usually curved; body of spine 0.5-1.5 cm.

*Euphorbia glochidiata*

15. Spine forked unequally (rarely subequally), the smaller tip seemingly a little side-branch of the main spine body.

*Euphorbia schizacantha*

## GROUP B - ARMED; LVS SIMPLE\*; SPINES SINGLE OR PSEUDOSPINOSE

1. Plant a shrub or usually small tree, bark peeling in yellowish papery rolls or strips; sap clear or milky, usually with a resinous odor.  
 COMMIPHORA - see Kuchar & Gillett (1988) Key 1
1. Plant a forb, shrub or tree, bark not bearing papery peels; sap mostly colorless, not resinous.
2. Leaf blade with 3-5(7) main veins from base.
3. Plant a shrub or tree.
4. Leaf margin entire; foliage gray-green or bluish, may seem mealy. *Opilia campestris*
4. Leaf margin toothed; foliage green.
5. Spines simple; leaf margin gland-toothed. *Ziziphus spina-christi*
5. Spines forked; leaf margin with larger teeth. *Cissus furcifera*
3. Plant a forb or (sub)succulent vine.
6. Plant a spindly woody annual forb; spines are mere prickles or small rough knobs; blade deeply 5-7 palmatifid. *Hibiscus cannabinus*
6. Plant with thickened hard fleshy base & vine-like stems; spines all or most >0.5 cm long.
7. Base grotesquely swollen into a green boulder-like organ to 0.5+ m diam; spines sparse, stout, mostly to 5-7 cm long & 0.5+ cm diam, ribbed. *Adenia ballyi*
7. Base not grotesquely swollen; spines densely covering at least portions of stem, dark, slender, to 0.1 cm long. *Adenia aculeata*
2. Leaf blade with only 1 main vein from base.
8. True spines borne on stem; a few species also have spine-tipped twigs.
9. Leaf with stellate hairs.
10. Plant an annual forb or dwarf shrub 0.1-0.4 m high; spines straight.
11. Plant a compact dwarf shrub; petiole weakly differentiated, to 2 mm long; blade to 0.1 cm long; fr a capsule. *Diceratella psilotrichoides*
11. Plant a woody annual forb; petiole 20-70 mm long; blade mostly >2 cm long; fr a berry. *Solanum anguivi*
12. Infl of ?cymes. *Solanum coagulans*
12. Infl of ?racemes.
10. Plant a shrub mostly 1-2(4) m high; spines straight or curved.
13. Leaf blade felty at least beneath.
14. Plant stout, 0.5-1.5 m high, growing mostly in the open; petiole 1-4(6) cm long; blade with 4-7 prs lateral veins; fr 2.5-3.5 cm diam. *Solanum incanum*
14. Plant slender, can ascend in bushes to 2+ m, growing mostly in the shade; petiole 0.4-1.5 cm long; blade with 2-3 prs

\*May be 3-fol. but with minute laterals generally (1/4 size of terminal leaflet.

- lateral veins; fr to 71 cm diam.
15. Stem spines usually half puberulent, strongly hooked; infl of axillary racemes. *Solanum forskalii*
15. Stem spines glabrous, usually slightly hooked or down-directed; infl of cymes. *Solanum longestamineum*
13. Leaf blade glabrous or hairy but not felty (*Solanum melastomoides* densely puberulent but not, or hardly, felty); petiole to 1 cm long.
16. Stem spines 1-4 mm long.
17. Base of blade acute, can be truncate; infl of few-fl'd umbels, corolla 1-1.5 cm long. *Solanum sp. aff. piperiferum*
17. Base of blade rounded; infl of axillary fascicles, corolla (1 cm long(?)). *Solanum hastifolium*
16. Stem spines 4-3 mm long; midrib of blade may bear 1 or 2 erect spines.
18. Stem spines straight; blade densely puberulent; fr (1.5 cm diam. *Solanum melastomoides*
18. Stem spines strongly hooked; blade subglabrous; fr 2-2.5 cm diam. *Solanum arundo*
9. Leaf glabrous or hairy but not stellate-hairy.
19. Leaf margin crenate-serrate.
20. Lvs leathery, often grayish-green glaucous-looking, with (0)2-4 prs lateral veins.
21. Plant leucory-aromatic, puberulent, lvs rough, petiole 0-1(2?) mm long. *Basananthe berbericoides*
21. Plant odorless, glabrous, lvs smooth, petiole >2 mm long.
22. Plant a prostrate mat-forming shrub; spines 1-3 cm long. *Maytenus obbiadensis*
22. Plant an erect shrub or small tree; spines 2-6 cm long. *Maytenus senegalensis*
20. Lvs not as above, lateral veins 6-8 prs. *Oncoba spinosa*
19. Leaf margin entire.
23. Plant usually a prostrate mat-forming shrub; spines often bear smaller secondary spines.
24. Lvs alternate; fls 71-1.5 cm long. *Convolvulus hystrix*
24. Lvs fascicled (also alternate?); fls 0.5-0.6 cm long. *Convolvulus ruspolii*
23. Plant usually erect; spines simple.
25. Lvs to 1(1.5) cm long, sessile or petiole (1 mm long; smaller shrubs (except *Terminalia parvula*).
26. Plant a tree; blade oval or obovate. *Terminalia parvula*
26. Plant a dwarf shrub or scrambling shrub; blade needle-like.
27. Plant a dwarf shrub; lvs mostly deeply grooved; spines 0.5-1 cm long. *Basananthe sp. = Gillett et al. 22078*
27. Plant a woody vine or dwarf shrub; lvs lacking distinct grooves; spines mostly (0.5 cm long, longer only on older stems(?).
28. Spines hooked, closely spaced (0.3-1 cm apart) along stems. *Asparagus somalensis*
28. Spines straight, predominantly on older nodes. *Asparagus africanus*
25. Lvs (0.5)1-5 cm long, petiole 1-11 mm long; large shrubs & trees.

29. Stem & lvs glabrous, possibly a few hairs on petiole; true spines & spine-tipped twigs; spines straight.
30. Blade oblanceolate or oblinear, with 0-2(3) prs lateral veins.
31. Lvs opposite. *Lawsonia inermis*
31. Lvs alternate. *Ximenesia americana*
29. Stems - at least younger ones - & often also lvs hairy; mostly lacking spine-tipped twigs; spines (?) often curved.
32. *Combretum aculeatum*
- Combretum* sp. aff. *constrictum*
- Combretum* sec. ?*Poivrea*
- Terminalia brevipes*
- Ximenesia caffra*
8. True spines absent; twig ends spine-tipped or somewhat sharp (pseudospinose).
33. Stem & lvs glabrous.
34. Sap milky, copious; lvs subsessile or sessile, 0.5-2.5 cm long; stipules absent.
35. Spine-branches alternate; leaf blade with 5-10 prs lateral veins. *Euphorbia cuneata*
35. Spine-branches in 3's; leaf blade with 1-4 prs lateral veins. *Euphorbia* sp. aff. *matabelensis*
34. Sap colorless & scarce or lacking; small stipules present.
36. Plant a dwarf shrub (1 m high; leaf blade 0.2-0.6 cm long, with 0(3?) prs lateral veins.
37. *Andrachne telephioides*
37. *Phyllanthus spinosus*
36. Plant a shrub 1-3+ m high; leaf blade 0.5-4 cm long, with 3-6 prs lateral veins.
38. Petiole 1-2 mm long; stems whitish. *Flueggea leucopyrus*
38. Petiole (1)2-5(9) mm long; stems not pale(?). *Flueggea virosa*
33. Stem & often lvs puberulent or hairy, at least when young.
39. Petiole 0-1.5(2) mm long; blade predominantly narrow (linear, lanceolate, oblong); small dwarf shrubs (except *Ochradenus somaliensis* to 1+ m high).
40. Leaf hairs some or all medifixed; sepals in fr forming 2 large flat orbicular wings (0.7)1-1.5 cm wide.
41. *Hildebrandtia africana*
- Hildebrandtia sepulosa*
- Hildebrandtia sericea*
40. Leaf hairs simple; sepals not enlarging in fr.
43. Foliage pale gray-looking because young stems, & sometimes lvs, densely covered with hairs, or otherwise pale.
44. Leaf blade obovate. *Polygala effusa*
44. Leaf blade oblinear or lanceolate-oblanceolate.
45. Young parts look mealy or glaucous though not obviously densely puberulent; blade oblanceolate, apex rounded. *Seddera spinescens*
45. Young parts densely white- or pale gray-puberulent; fr a black capsule 2-3 mm diam; blade oblinear-linear or lanceolate.
46. Terminal 1-2 mm of twigs consist of a glabrous orange or red spine. *Campylanthus spinosus*

46. Terminal portion of twigs undifferentiated.  
*Campylanthus incanus*
43. Foliage not pale gray.
47. Lvs opposite & fascicled, subtended by stipules.  
*Pentanisia microphylla*
47. Lvs alternate & fascicled, stipules none.
48. Fls in a terminal spikelike raceme; younger twigs  
pale yellowish-tan. *Ochradenus somaliensis*
48. Fls axillary, single or in small ?fascicles.
49. Stem & leaf hairs ascending or adpressed; blade 0.4-  
1(1.5?) cm long, apex acute; fr a capsule 4(5) mm.  
*Seddera bagshawei*
49. Stem & leaf hairs (?) erect; blade (0.4)0.7-4 cm long,  
apex rounded. *Polygala senensis*
39. Petiole 1-6(12) mm long; mostly larger dwarf shrubs &  
shrubs.
50. Leaf blade reniform; twigs, especially the older ones,  
blackish; single axillary fls. *Ipomoea donaldsonii*
50. Leaf blade oblanceolate, obovate-elliptic or obovate;  
twigs (?) not dark.
51. Plant a tree or tall shrub; leaf blade 1-4(6) cm long,  
with 3-6 prs lateral veins. *Terminalia brevipes*
51. Plant a dwarf shrub or shrub; leaf blade 0.5-1.5(2) cm  
long, with 0-3 prs lateral veins.
52. Leaf apex mostly notched; fr with 2 flat winglike  
sepals (1)1.5-2.5 cm wide. *Hildebrandtia obcordata*
52. Leaf apex rounded; fr a capsule. *Ipomoea sultani*

GROUP C - ARMED; LVS SIMPLE; STEM SPINES >1 TOGETHER, &/OR LVS OR  
FLORAL BRACTS ARMED

1. Stems bearing paired spines at nodes (spines in 3's in *Sesamothamnus* spp, in 2's & 3's in *Terminalia spinosa*, in 4's in *Fagonia bruguieri*); leaf & inflorescence may also be armed.
2. Leaf margin crenate-serrate or lobed.
3. Lvs lobed.
4. Spines simple.
  5. Plant glabrous; spines are mere prickles to 0.5 cm long. *Jatropha tropaeolifolia*
  5. Plant mealy-puberulent or hairy; spines 0.5-2.5 cm long.
  6. Plant a woody vine or sprawler; tendrils present. *Momordica spinosa*
  6. Plant a dwarf shrub; tendrils none. *Jatropha nogalensis*
4. Spines branched or dissected.
  7. Plant glabrous, somewhat succulent; spines (actually stipules) dissected into several threadlike gland-tipped segments. *Jatropha glauca*
  7. Plant hairy, succulent.
    8. Plant small, densely spiny, the spines simple or more often with 2- or 3-pronged tips; petiole 1-2 cm long. *Jatropha paradoxa*
    8. Plant 0.5-1(2?) m high, spine prs consist of stout pegs bearing 2-4 simple or branched spines each; petiole (1)3-13 cm long. *Jatropha ellenbeckii*
3. Lvs not lobed.
  9. Plant a low-growing (succulent?) perennial; stems covered with root-like soft thin black branched spines.
  10. Leaf blade oblinear, with c10 prs lateral veins. *Jatropha obbiadensis*
  10. Leaf blade ovate to orbicular, with c2-4 prs lateral veins. *Jatropha marginata*
  9. Plant a shrub or tree; spines simple.
    11. Plant a mostly vase-shaped shrub 1-3 m high, when cut exudes a viscous light yellowish sap which may turn orange or red.
    12. Spines 0.2-0.6 cm long; young parts mealy-puberulent. *Jatropha arguta*
    12. Spines 1-6 cm long; lvs densely hairy. *Jatropha dichter*
    11. Plant a broad sprawly shrub 1-5 m high, or a tree; no obvious sap.
    13. Lvs fascicled on short-shoots; petiole 0.5-4 mm long. *Ziziphus hamur*
    13. Lvs alternate; petiole 2-15 mm long.
    14. Blade strikingly discolored, white-felty beneath. *Ziziphus mauritiana*
    14. Blade concolorous, glabrous or minutely puberulent.
    15. Blade oval or elliptic-oblong, base more or less symmetric. *Ziziphus spina-christi*
    15. Blade ovate, base usually markedly asymmetric.

*Ziziphus mucronata*

2. Leaf margin entire; mostly only 1 main vein from leaf base.  
 16. Stem spines simple. [also *Ziziphus mauritiana*]  
 17. Spines 2-7 mm long, mostly hooked.  
 18. Spines straight, 4-7 mm long; erect vase-shaped shrub with yellow or orange sap. *Jatropha rivae*  
 18. Spines hooked, 2-4(6) mm long; scrambling shrub & woody vine, no sap.  
 19. Leaf blade rather thick & leathery, apex with a prickle-like hooked mucro. *Capparis cartilaginea*  
 19. Leaf blade not thick, apex unarmed.  
 20. Blade felty-puberulent at least beneath. *Capparis tomentosa*  
 20. Blade glabrous or hairy but not felty [also *C. decidua*].  
 21. Sepals glabrous or with a few long hairs. *Capparis sepiaria*  
 21. Sepals hairy. *Capparis fascicularis*  
 17. Spines 5-20(25) mm long, mostly straight.  
 22. Spines in 3's, with a central spine 5-12 mm long subtending a pr of prickles 1-3 mm long; foliage with pale meal-like dots.  
 23. Twigs & lvs ?puberulent; corolla-lobes fringed. *Sesamothamnus busseanus*  
 23. Twigs & lvs glabrous; corolla-lobes entire. *Sesamothamnus rivae*  
 22. Spines in 2's, 3's or 4's but equal in size; lvs opposite or fascicled.  
 24. Plant a dwarf shrub (or woody forb); spines in 2 prs per node; leaf blade linear. *Fagonia bruguieri*  
 24. Plant a taller shrub or tree; spines 1 pr (or in 3's); leaf blade broader.  
 25. Leaf apex with a hard sharp mucro; sap milky. *Cariassa edulis*  
 25. Leaf apex rounded; sap not milky.  
 26. Spine prs diverging at 180°; plant a shrub.  
 27. *Canthium glaucum*  
 27. *Meyna tetraphylla*  
 26. Spine prs ?not widely diverging; plant a tree; branches zigzag. *Terminalia spinosa*  
 16. Stem spines variously branched or dissected, or with at least 1 or 2 marginal teeth.  
 28. Stem spines 4-rayed, shalk-white; most species have at least some bifid hairs on lvs.  
 29. Stems densely puberulent.  
 30. Leaf blade elliptic-oblong or oblanceolate; infl 3-6 cm long, with stalked glands or long bristly hairs; fls blue. *Barleria waggana*  
 30. Leaf blade lanceolate, ovate or elliptic(-ovate); infl 1.5-2(3) cm long, lacking glands & bristles; fls yellow or orange (or white?). *Barleria quadrispina*  
 29. Stems glabrous or sparsely puberulent.  
 31. Leaf blade linear to narrowly lanceolate; infl of single fls, corolla lemon yellow. *Barleria n.sp.* = Popov 1161  
 31. Leaf blade lanceolate to obovate; infl strobiloid, mostly with several fls. [also *B. bicolor*]  
 32. Fls white or pale purple; infl 4-7 cm long. *Barleria sp. aff. waggana*

32. Fls orange or yellow.
33. Leaf blade obovate, elliptic-obovate or suborbicular; infl 2-6 cm long, the bracts recurved & separating; corolla orange or yellow. *Barleria eranthemoides*
33. Leaf blade lanceolate, oblanceolate or obovate-oval; infl 1.5-3(4) cm long, corolla mostly vivid orange-red, sometimes yellow. *Barleria proxima*
28. Stem spines variously dissected but not regularly 4-rayed.
34. Stem covered at least in sections by a tangle of branched threadlike soft spines; leaf tip may be mucronate but not spinose.
35. Leaf blade oblinear, 3-9 cm long. *Jatropha obbiadensis*
35. Leaf blade broadly ovate or elliptic, 1.5-4 cm long. *Neuracanthus polyacanthus*
34. Stem with paired spines but not a threadlike tangle; leaf spine-tipped.
36. Plant looks pale blue-green & hoary; stem spines with 1 or 2 prs large teeth. *Barleria* sp. aff. *acanthoides*
36. Plant looks dark green; stem spines various.
37. Plant a dwarf shrub to 0.5 m high; stem spines more or less dissected. *Barleria acanthoides*
37. Plant a shrub 1-1.5 m high; stem spines unbranched or (usually) with a pr of short (1-4 mm) lateral spines toward base. *Barleria longissima*
1. Stem unarmed; leaf &/or inflorescence armed.
38. Leaf spine-tipped.
39. Lvs alternate (alternate & opposite in *Elaeodendron*), mostly succulent or leathery, evergreen; infl unarmed.
40. Plant a stemless or short-stemmed succulent with large (>1 dm long) mostly lanceolate lvs.
41. *Aloe ambigua*  
*Aloe citrina*  
*Aloe inermis*  
*Aloe microdonta*  
*Aloe* sp. aff. *tomentosa*  
*Sansevieria* sp. aff. *ehrenbergii*
40. Plant a shrub or sometimes woody scrambler.
42. Leaf margin spiny.
43. Plant a dwarf shrub, shrub or scrambler with strong spicy odor; blade 0.7-2.3 cm long. *Vernonia mogadoxensis*
43. Plant a large shrub or small tree, odorless; blade 2-8 cm long. *Elaeodendron equifolium*
42. Leaf margin entire.
44. Foliage often bluish; petiole glabrous or densely finely papillate; blade 0.5-3.5 cm long, with 0-3 prs main veins.
45. Leaf blade elliptic to suborbicular, with (1)3-5 main veins from base; petiole glabrous. *Maerua subcordata*
45. Leaf blade narrowly elliptic or oval-elliptic, with 1 main vein; petiole finely papillate.
46. Petiole 0.5-1.5 mm long, blade 0.5-1(2) cm long; a shrub or more or less a vine. *Maerua pseudopetalosa*
46. Petiole 2-5 mm long, blade (1)1.5-3.5 cm long; a dwarf shrub to 0.5 m high. *Maerua* 'blue'
44. Foliage dark green; petiole usually puberulent; blade

- 2-12 cm long, with 3-15 prs lateral veins.  
 47. Petiole 2-4 (5) mm long, blade 2-5(6) cm long.  
*Boscia mossambicensis*  
 47. Petiole 3-13 mm long, blade 3-12+ cm long. *Boscia coriacea*  
 39. Lvs mostly in whorls of 4, may also be opposite or in tufts;  
 deciduous & non-succulent dwarf shrubs & forbs, lvs may  
 often be stiff but generally not leathery; infl armed.  
 48. Leaf margin usually spiny or sharp-toothed; fls in a  
 strobiloid spike (1) 2-7 cm long with spiny bracts  
 1.5-2.5 cm long.  
 49. Plant a dwarf shrub; lvs glabrous, ovate to oblong,  
 jointed on a white peg c1 mm long. *Acanthus* sp. = Beckett 697  
 49. Plant a (woody) annual forb; lvs rough-hairy, linear  
 to oblong-elliptic.  
 50. Lvs oblong-elliptic or oblanceolate-oblong, floral  
 bracts 1.5-2 cm long. *Blepharis glinus*  
 50. Lvs oblinear or linear, floral bracts 2-2.5 cm long.  
 51. *Blepharis ciliaris*  
 51. *Blepharis linariifolia*  
 48. Leaf margin entire; fls single or paired or in spikes  
 to 1.5 cm long.  
 52. Petiole 2-5(10) mm long; blade oval or broadly elliptic,  
 margin not involled. *Alternanthera pugens*  
 52. Petiole 0-1 mm long; blade linear to narrowly oblong,  
 margin strongly involled.  
 53. Blade rough with stiff hairs; single axillary &  
 terminal fls.  
 54. Lvs 0.5-1.3 cm long, lanceolate-elliptic; young  
 stems felty-puberulent. *Blepharis hildebrandtii*  
 54. Lvs 1-5.5 cm long, linear; stems rough & brittle.  
*Blepharis* sp. = Kuchar 17644  
 53. Blade smooth; single or paired fls or short spikes.  
 55. Plant a dwarf shrub; lvs 0.3-1(1.5) cm long; leaf  
 seems puberulent, encrusted with tiny white dots.  
*Blepharis phillipsiae*  
 55. Plant a scrambling dwarf shrub or twiner; lvs 1-4(7)  
 cm long. *Blepharis* n.sp. = Bally & Melville 15332  
 38. Leaf unarmed.  
 56. Plant a low-growing dwarf shrub, may form compact mats; lvs  
 opposite or in tufts; at least younger parts white cottony  
 or flannelly with dense cover of hairs; at least some floral  
 bracts dissected or branched [assumed in *Neurac. picta*?].  
 57. Leaf blade broadly ovate or ovate-elliptic to orbicular;  
 corolla purple or dark blue. *Neuracanthus polyacanthus*  
 57. Leaf blade narrower, mostly oblanceolate, may also be  
 oblinear or elliptic; corolla blue or white.  
 58. Fls white.  
 59. *Neuracanthus praecanus*  
 59. *Neuracanthus stolonosus*  
 58. Fls blue or bluish-purple [also *N. picta*?].  
*Neuracanthus robecchii*  
 ?*Neuracanthus picta*  
 56. Plant a low-growing or scrambling shrub; lvs predominantly  
 in 4's (except *Barleria* sp., maybe *Crossandra spinosa*?);

younger parts hairy but rarely white-cottony; floral bracts entire.

59. Dwarf shrub; petiole 1-3 mm long; infl 1-1.5 cm long; corolla white with yellow in throat.

*Barleria* sp. = Gillett et al. 22350

59. Dwarf shrub or straggling/scrambling shrub; infl a spike 2-6 cm long; corolla yellow, orange or red; petiole mostly jointed on a 1-1.5 mm peg.

60. Younger stems minutely puberulent.

61. Petiole seems to 1 cm long; blade 2-3(+?) cm long; corolla yellow, c2-2.5 cm long. *Crossandra baccarinii*

61. Petiole seems (0.5)1-4 cm long; blade 3-5.5 cm long; corolla creamy orange, 3-3.5 cm long. *Crossandra arenicola*

60. Younger stems densely puberulent & felty, blade often felty when young.

62. Petiole (0)0.5-1.5(3) cm long; blade 1-4(5) cm long, with 3-5 pre lateral veins. *Crossandra spinosa*

62. Petiole 1-5 cm long; blade 3-6 cm long, with 5-8 pre lateral veins. *Crossandra mucronata*

GROUP D - ARMED; LVS COMPOUND

1. Plant a tree or shrub, less often dwarf shrub; sap milky or clear, usually with a resinous odor; bark often with papery peels. *COMMIPHORA* - see Kuchar & Gillett (1988) Key; Grp II
1. Plant a woody forb, dwarf shrub, shrub or tree; lacking obvious resinous sap; bark not papery-peeling.
2. Leaflets 2 or 3.
3. Plant a stout shrub or tree.
4. Leaflets 2; plant evergreen.
5. Spines simple; petiole mostly 2-8 mm long. *Balanites aegyptiaca*
5. Spines usually bearing prickles; petiole 1-2 mm long. *Balanites rotundifolia*
4. Leaflets 3; plant deciduous; petiole 15-150 mm long, & bearing prickles. *Erythrina melanacantha*
3. Plant a dwarf shrub or forb.
6. Lvs opposite; plant glandular; spines in 4's at nodes.
7. Leaflets linear, 1.5-2.5 cm long, apex with a hard sharp white mucro; fls light purple. *Fagonia schweinfurthii*
7. Leaflets elliptic-oblanccolate, 0.7-1.5 cm long; fls rose. *Fagonia isotricha*
6. Lvs alternate; plant not glandular; floral axis sharp-tipped.
8. Stipules lanceolate-elliptic, 2-5 mm long, sharp-tipped; leaflets narrowly elliptic or linear-elliptic. *Indigofera 'kucharii'*
8. Stipules narrowly linear, 1-2.5 mm long; leaflets obovate-spatulate or (obovate-)elliptic. *Indigofera spiniflora*
2. Leaflets >3.
9. Plant a palm with numerous linear leaflets.
10. *Hyphaene benadirensis*  
*Hyphaene compressa*  
*Phoenix reclinata*
9. Plant a dwarf shrub, shrub or tree; leaflets fewer and broader.
11. Rachis winged, leaflet margin toothed.
12. Plant aromatic. (only in S Somalia?) *Zanthoxylum chalybeum*
12. Plant odorless. *Harrismia abyssinica*
11. Rachis not winged, leaflet margin entire.
13. Stem with single orange spines; leaflets 3-5(7). *Indigofera spinosa*
13. Stem with paired spines; leaflets apparently c15-25 but each leaflet is actually a pinnule of minute coalesced leaflets. *Acacia leucospira*

## GROUP E - ARMED, LVS DOUBLY PINNATE

1. Spines in pairs.
2. All or most spines short, (1 cm long [longer in *A. robusta*?]).
3. Leaflets 1-6 prs per pinna.
  4. Leaflets 1(2) prs, petiolule 1-3 mm long; spines sharply hooked. *Acacia mellifera*
  4. Leaflets 2-6 prs, petiolule to 1 mm long; spines straight to moderately hooked.
  5. Twigs zigzag, often with a pair of ridges or low flanges; pod usually with purple markings. *Caesalpinia erianthera* (incl. sp. aff.)
  5. Twigs not zigzag(?); leaflets 3-6 prs per pinna; pod unmarked, finely longitudinally striate. *Parkinsonia scicana*
3. Leaflets 5-30 or more prs per pinna.
  6. Spines all short, (0.6 cm (to 1 cm in *A. robusta*?)).
  7. Leaflets 2-4 mm long, pinnae 1-3 prs.
    8. Lvs 1.5-4 dm long, pinna rachis flat, leaflets >30 prs per pinna. *Parkinsonia aculeata*
    8. Lvs (1 dm long, pinna rachis not flat, leaflets to 11 prs per pinna. *Acacia reficiens*
  7. Leaflets 4-20(25) mm long.
    9. Plant a big riparian tree with rosy gray or brownish-gray bark; fr a long narrow curving brown pod 7-20 x 0.6-0.7 cm. *Acacia robusta*
    9. Plant ?smaller; fls red or yellow, in large racemes. (in cent. Somalia?) *Caesalpinia pulcherrima*
6. Spines usually not all short, at least a few long (1-6 cm) straight ones intermixed; pinnae (1)4-10 prs, leaflets up to 20+ prs.
  10. Leaf rachis (2 cm long; pod contorted or spirally\* twisted, narrow. *Acacia tortilis*
  10. Leaf rachis to 5 cm long; pod straight, 0.7-2 cm wide. *Acacia etbaica*
2. All spines relatively long, (0.5)1-6(10) cm, straight.
  11. Ant-galls present (if absent in *Acacia seyal*, bark is powdery).
    12. Branches develop a yellow, yellowish-green or orange (-reddish) powder which persists on trunk, or disappears to reveal green (or orange) bark; fls in yellow balls.
    13. Leaflets 3-10 prs per pinna; calyx 0.8-1.5 mm long, corolla 2-2.5 mm long. *Acacia zanzibarica*
    13. Leaflets 7-20 prs per pinna; calyx 2-2.5 mm long, corolla 3.5-4 mm long. *Acacia seyal* var. *fistulata*
  12. Branches not powdery, stems & bark dark gray-brown, brown or black; fls in white spikes.

\*A tree much resembling *A. tortilis* has been found in Ceel Dheer and Buulo Burte Districts (Herlocker, Kuchar 16721), with a narrow straight pod 0.5-1 dm long.

+Not expected to occur in CR but the differences between it and the very similar *A. zanzibarica* are given in case doubts arise.

14. Ant-galls uniformly tapering, broadest at the base.  
*Acacia horrida*
14. Ant-galls ovoid or elliptic, abruptly narrowed at base.  
*Acacia bussei*
11. Ant-galls absent.
15. Plant a prostrate or low-growing dwarf shrub to 0.5 m high; leaflets 0.5-2 mm long.
16. Lvs white-hoary with dense mat of hairs; spines 1-4 cm long, woolly at least toward base; fr a densely felty, thick, slightly curved to spiral pod. *Acacia leucospira*
16. Lvs puberulent but not white-hoary; spines 0.5-1(1.5) cm long; fr a linear dark pod 8-12 x 1-1.5 cm.  
*Acacia humifusa*
15. Plant low or tall but not a subprostrate or creeping shrub; leaflets usually >2 mm long.
17. Foliage glabrous or sparsely puberulent, twigs (?) generally lacking bristly hairs [?correct for *A. sp.* = G&B 23200].
18. Leaflets usually with >1 vein; fr a more or less straight lumpy striate pod 10-15 x 1-1.5 cm.
19. Leaflets 2-6 mm long, in 4-13 prs per pinna; spines erect. *Acacia bricchetiana*
19. Leaflets 6-15 mm long, in 1-4(5) prs per pinna; spines slightly reflexed. *Acacia walwalensis*
18. Leaflets with only 1 vein evident.
20. Plant a (flat-topped vase-shaped) shrub (with garlic odor when cut); stems ?pale gray; spines (0.5)1-3 (4) cm long.
21. Leaflets 1.5-2.5 mm long; fr a terete reddish-\_\_\_\_\_ pod 15+ cm long. *Acacia n.sp.* = Gillett & Beckett 23200
21. Leaflets 2.5-6 mm long; fr a flat dull yellow or tan pod 5-10 cm long.
20. Plant a tree (or tall shrub) with darker stems; spines 0.5-6.5 cm long.
22. Plant a vase-shaped tree to 5 m high; leaflets somewhat thickened, with red petiole 1(1.5?) mm long; fr a thick compressed curved tan-brown pod 5-9 x 2-2.5(3) cm. *Acacia n.sp.* = Kuchar 17258
22. Plant not vase-shaped, generally a tree with a globose crown; leaflets not thickened; spines somewhat reflexed; fr a flat segmented black pod (5)10-15 x 1-1.5 cm. *Acacia nilotica*
17. Foliage hairy, twigs with bristly white hairs; mostly vase-shaped, flat-topped shrubs & small trees.
23. Young stems with at least some long (1.5-3 mm) hairs; on silts and clays.
24. Pinnae (1)4-5 prs; pod curved, 0.5-1 cm wide. *Acacia paclii*
24. Pinnae 4-12 prs; pod straight, 1.5-2.5 cm wide. *Acacia stuhlmannii*
23. Young stems with all hairs (0.75 mm long; pod thick

- & woody; on sands.
25. Leaflets 5-12(20) prs per pinna; spines mostly 0.5-3.5(5) cm long; pod mostly curved, 7-15 x 1.5-2.5 cm long. *Acacia edgeworthii*
25. Leaflets 8-30 prs per pinna; spines mostly (2)3-6.5 cm long; pod straight, 8-20 x 1-1.5 cm. *Acacia turnbulliana*
1. Spines single or in 3's (some in 2's in *Caesalpinia erianthera*).
26. Spines straight, generally stout, often much longer than 1 cm, often twig-like.
27. Stipules ovate, thickish, ridged, 2-3 mm long; pinnae 1 pr. *Calliandra gilbertii*
27. Stipules tiny if present; pinnae 1-19 prs.
28. Pinnae 1-5 prs; leaflets 3-11 prs per pinna; fr straight erect pods. *Dichrostachys kirkii*
28. Pinnae (2)5-19 prs; leaflets 9-20+ prs per pinna; fr a tangled cluster of contorted pods. *Dichrostachys cinerea*
26. Spines prickly-like, often curved, 2-7(10) mm long.
29. Leaflets (3)4-20 mm long.
30. Leaflets (3)6-20 prs per pinna; spines in 1's & 3's; rachis unarmed; pod flat, straight, 4-15 x 1-2 cm.
31. Petiole with small gland (1 mm diam; pinnae 3-6 prs; leaflets (3)7-20 prs per pinna. *Acacia asak*
31. Petiole with large (1-3 mm) discoid gland.
32. Discoid gland at top of petiole; petiole to 0.5 cm long; pinnae 3 prs; leaflets 5-13 prs, 5-13 mm each. *Acacia caraniana*
32. Discoid gland near base of petiole; petiole c1-2.5 cm long; pinnae 3-4 prs; leaflets 6-9 prs, 9-20 mm each. (only N Somalia?) *Acacia condyloclada*
30. Leaflets 1-5 prs per pinna; spines mostly in 3's (except *Caesalpinia oligophylla*); rachis mostly armed.
33. Spines single; leaflets with c4-10 prs lateral veins; pinnae 1-2 prs, leaflets 1-2 prs, prickles narrow. *Caesalpinia oligophylla*
33. Spines mostly in 3's; leaflets with mostly 0-3 prs lateral veins.
34. Rachis unarmed; straggly whippy tree; pinnae 1 pr, leaflets 2-5 prs. *Acacia ogadensis*
34. Rachis with prickles; a more compact-crowned shrub or small tree; pinnae 1-3 prs.
35. Leaflets 1(2) prs per pinna; lateral spines upcurved, or straight but slightly upward-directed. *Acacia zizyphispina*
35. Leaflets 2-4 prs; (virtually) all spines (slightly) down-hooked. *Caesalpinia erianthera*
29. Leaflets 1-5 mm long.
36. Spines in 1's (sometimes seen in 3's in *Caesalp. trochae*).
37. Lvs with 1-2(3) prs pinnae.
38. Leaflets 2-5 prs per pinna; petiole 2-4 mm long.
39. Prickles straight or scarcely curved; leaflets broadly oblong, 1.5-4.5 mm long; fls white (pink?). *Acacia somalensis*
39. Prickles hooked; leaflets 1.5-2(2.5) mm long; fls pink.

38. Leaflets 4-9 prs per pinna; petiolule 2.5-10 mm long. *Acacia moggii*
37. Lvs with (2)3-17 prs pinnae. *Acacia unispinosa*
40. Leaflets 3-12(18) prs per pinna.
41. Stipules relatively large & leaflet-like, 3-25 mm long, 2-3 lobed; plant confined to littoral. (only S Somalia?) *Caesalpinia bonduc*
41. Stipules inconspicuous if present.
42. Spines regularly distributed; leaflets 1-4(7) mm long; fls in dense white spikes; pod (3)4-14 cm long. *Acacia senegal*
42. Spines scattered, deep (i.e. flanged); leaflets 3-10 (15?) mm long; fls purplish-pink, in racemes; pod boat-shaped, 1.5-5 cm long, beaked. *Caesalpinia trochae*
40. Leaflets 25-50 prs per pinna; fls in white balls. *Acacia brevispica*
36. Spines in 3's; petiole usually with a gland above; fls in white spikes incl. *A. brevis?*, *A. pseudoglaucophylla?*
43. Leaflets 8-20 prs per pinna; mostly a tree with a full dense crown; older bark dark, rough & furrowed; fr a flat thin oblong pod 3-7+ cm long. *Acacia senegal*
43. Leaflets 2-8 prs per pinna; a shrub or straggly tree.
44. Spines to 10 mm long; lvs 1.5-5 cm long, pinnae (3)4-6 prs; a slender tree with 1 or 2 whiplike branches much longer than the rest. *Acacia cheilanthifolia*
44. Spines (1)2-5 mm long; lvs (1)1.5-4 cm long, pinnae 2-4 prs; a dwarf shrub or shrub.
45. Plant a spreading dwarf shrub (1 m high; pod broadly oblong (to suborbicular); leaflet apex usually abrupt-acute & mucronate. *Acacia brevis*
45. Plant a compact erect dwarf shrub or shrub; leaflet apex rounded to acute.
46. Pinna rachis with an apical hooked prickles; lvs 2-4 cm long; pod flat, broadly oblong, markedly twisted/contorted. *Acacia hamulosa*
46. Pinna rachis unarmed(?); lvs 1-2(+?) cm long; pod flat, 5-10 x 1(1.5). *Acacia pseudoglaucophylla*

## GROUP F - TENDRILLATE

(also *Eureiandra somaliensis*, *Momordica* sp. 'A')

1. Stems thick, usually  $\geq 1$  cm diam, at least when older or toward base; mostly succulent robust creepers or climbers or large woody vines, rarely erect shrubs; often leafless.
2. Older stems 4- or 5-angled or ribbed.
3. Stem & lvs rough, lvs brittle; older stems woody & strongly 5-ribbed. *Kedrostis gijef*
3. Stem & lvs smooth; stems sharply 4- or 5-angled.
4. Stems 5-angled. *Cissus quinquangularis*
4. Stems (more or less) 4-angled.
5. Older stems becoming woody & developing corky wings; lvs not succulent; petiole to 10 cm long, blade to 13 cm long, apex acute to (scarcely) acuminate. *Cissus petiolata*
5. Older & young stems basically fleshy; lvs succulent; petiole 3 cm long, blade to 6 cm long, apex rounded or acute.
6. Stem 3-6 cm diam including wings, these undulate; tendrils hard & stout, 3 mm diam toward base. *Cissus cactiformis*
6. Stem narrower, wings straight; tendrils narrower. *Cissus quadrangularis*
2. Older stems terete or more than 5-ribbed.
7. Younger stem & lvs puberulent, mealy-puberulent & pale toward stem apex.
8. Stems swollen toward base; blade base with 2 distinct or fused glands. *Adenia ellenbeckii*
8. Stems not abruptly swollen toward base; blade base lacking obvious glands. *Cissus aphyllantha*
7. Younger stem & lvs glabrous or sparsely puberulent; lower part of main stem swollen into a fleshy-woody trunk 1-2 m high; lvs deeply 3-5(7) lobed. *Adenia venenata*
1. Stems relatively slender: mostly herbaceous or moderately woody vines & creepers, leaf-bearing, can be (sub)succulent.
9. Lvs compound.
10. Lvs 3-6 palmate.
11. Leaflets 3-5.
12. Lvs strictly 3-fol. *Cyphostemma serpens*
12. Lvs 3-5 fol.
13. Stem & lvs glabrous; leaflets ovate to elliptic, 2-7+ cm long, margin mostly remotely toothed. *Cyphostemma ternatum*
13. Stem &/or lvs puberulent at least when young.
14. Petiole 1-6 cm long, leaflets 2-11 cm long.
15. Petiole to 7 mm long; foliage may be glandular. *Cyphostemma dysocarpum*
15. Petiole c10(25) mm long; foliage not glandular; leaflets (may be) strongly discolorous, apex mostly shortly acuminate. *Cyphostemma cyphopetalum*
14. Petiole 0.1-1(2) cm long, leaflets 0.5-4 cm long.
16. Lvs all 5-fol, glandular (especially petiole?); leaflets 1 cm long, sharply deeply toothed.

- Cyphostemma phyllomicon*
16. Lvs 3-5 fol, not glandular; leaflets 1-4 cm long.  
 17. Petiole 1-4 mm long; leaflets oblanceolate, with  
 (3)4 large (sub)apical teeth or lobes.
- Cyphostemma crithmifolium*
17. Petiole 3-15(20) mm long; leaflets obovate or  
 spatulate, coarsely toothed.
- Cyphostemma engleri*
11. Leaflets 5-6.  
 18. Stems glabrous except for a few scattered short glandular  
 hairs. (not in CR)
- Cyphostemma adenocaulis*
18. Stems puberulent. *Cyphostemma* sp. = Hemming 2161
10. Lvs variously doubly compound, rarely 3-5 fol.  
 19. Lvs (?) glabrous, pitted above; leaflets with 1-3 prs  
 lateral veins. *Momordica trifoliolata*
19. Lvs puberulent at least on rachises; leaflets with 3-6  
 prs lateral veins.
20. Lvs simply or doubly trifoliate. *Cardiospermum halicacabum*  
 20. Lvs doubly compound with 5 pinnae of which the basal pr  
 is 3-5 pinnate. *Cardiospermum corindum*
9. Lvs simple.
21. Tendrils some or all bifid.
22. Petiole 0.5-2 cm long, blade to 2 cm long, bilobed, not  
 rough-hairy. *Tylosema argentea*
22. Petiole often >2 cm long, blade often >2 cm long,  
 palmately 3-5(7) lobed, mostly rough.
23. Blade ovate or oblong-ovate in outline, pinnately  
 lobed, the lobes variously lobulate (i.e. look  
 dissected) rarely subentire.
24. Stem & leaf underside very rough. *Citrullus colocynthis*  
 24. Stem & leaf fairly rough to (usually) rather softly  
 hairy. (not in CR) *Citrullus lanatus*
23. Blade broadly ovate to reniform in outline, palmately  
 3-5 lobed, the lobes merely low-toothed & not  
 lobulate. (probably only N Somalia) *Kedrostis leloja*
21. Tendrils all simple.
25. Stem &/or leaf rather to very rough.
26. Blade deeply 3-5 lobed, the lobes distinctly lobulate.
27. Blade 7-8 cm long, rough above & (?) felty beneath;  
 stem ?smooth. (not in CR?) *Eureiandra cogniauxii*
27. Blade 2-10 cm long, rough beneath & smooth above  
 except along veins; stem rough. *Citrullus colocynthis*
26. Blade unlobed to deeply 3-5 lobed but lateral lobes  
 generally not lobulate (or shallowly pinnately lobu-  
 late in *Cucumis halabarda*).
28. Blade unlobed or with 3 (rarely 5) lobes, the central  
 lobe much larger than the laterals.
29. Petiole 0.5-1.5 cm long, blade lanceolate in outline.  
*Cucumis halabarda*
29. Petiole 1-8 cm long, blade ovate to orbicular in  
 outline. *Cucumis figarei*
28. Blade equally or subequally 3-5 lobed, the laterals not  
 conspicuously smaller.
30. Fr fusiform or pyriform, (long-)beaked, orange or red,  
 smooth.

31. *Kedrostis foetidissima*  
 31. *Kedrostis leloja* (prob. only N Somalia)  
 30. Fr ellipsoid to subglobose, blunt-ended, yellow,  
 warty or with soft fleshy spines.  
 32. Fr with broadly conical warts; leaf lobes with sinus. *Cucumis figarei*  
 32. Fr with soft fleshy spines.  
 33. Plant annual; blade unlobed to shallowly broadly 3-  
 lobed; fr ellipsoid, surface not readily visible  
 between the dense spines. *Cucumis dipsaceus*  
 33. Plant perennial; blade mostly deeply 3-5 lobed; fr  
 subglobose to ellipsoid, surface readily visible  
 between the scattered spines. *Cucumis prophetarum*  
 25. Stem & leaf smooth (only margin rough in *Momordica*  
*cymbalaria*) or slightly rough only.  
 34. Petiole 0-8(10) mm long.  
 35. Tendrils axillary.  
 36. Plant with fetid odor; leaf margin with a few teeth  
 or gland-teeth. *Cissus aphylla*  
 36. Plant without fetid odor; leaf margin entire though  
 may be lobed near base.  
 37. Blade oblong or ovate to subreniform, base rounded  
 to shallowly cordate. *Helinus integrifolius*  
 37. Blade linear or lanceolate rarely oblong-ovate, often  
 drying very dark bluish-green, base deeply cordate-  
 auricled. *Momordica sessilifolia*  
 35. Tendrils at tip of leaf or branch.  
 38. Branch tip tendrillate; foliage with unusual,  
 perhaps unpleasant odor. *Basananthe merdulae*  
 38. Branch tips not tendrillate, leaf tip tendrillate.  
 39. Blade linear. *Gloriosa minor*  
 39. Blade broader. *Gloriosa superba*  
 34. Petiole (5)10-30(60) mm long.  
 40. Stipules subreniform, 0.5-1 cm long; plant malodorous.  
 (exotic, not CR?) *Passiflora foetida*  
 40. Stipules absent; plant not malodorous.  
 41. Stem & blade glabrous; blade scarcely to slightly  
 rough & white-dotted. *Coccinia grandis*  
 41. Stem &/or blade puberulent, mostly smooth.  
 mostly deeply 3(5) lobed.  
 42. Leaf margin with large teeth. *Momordica balsamina*  
 42. Leaf margin sinuate & mucro-toothed, or obscurely  
 toothed.  
 43. Stem glabrous, leaf-lobes with or without basal  
 sinus; blade 2-5 cm long. *Corallocarpus ellipticus*  
 43. Stem glabrous or puberulent, leaf-lobes with marked  
 basal sinus; blade 2-9 cm long. *Corallocarpus epigaeus*

GROUP G

GROUP H

1. Plant 2-4 m tall; leaf blade often to 1+ m long, c1 cm wide; infl a cylindric brown spike 2-2.5 dm x 1-2 cm.  
*Typha domingensis*
1. Plant rarely >2 m tall, & then with a compound inflorescence or narrower spike.
2. Leaves alternating, scape usually terete; fls subtended by glumes & by a thin lemma & usually palea.  
GRASSES: see Cope 1985
2. Leaves in whorls of 3, scape often triangular; fls subtended only by glumes. (SEDGES)
3. Plant tussocky, base with pseudobulb or distinctly swollen stem.
4. Infl a compact globose or oblong-globose head, mostly white in color; spikelets 2-8 x 1-2 mm, with 2-6 fls.
5. Glumes 2-2.5 mm long. *Mariscus dubius*
5. Glumes 3-6 mm long.
6. Fls only 2 per spikelet; glumes 3.5-6 mm long; leaf blade 2-7 mm wide, puberulent. *Kyllinga alba*
6. Fls 2-6 per spikelet; glumes 3-4 mm long; leaf blade 1-3 mm wide, glabrous. *Mariscus circumclusus*
4. Infl compact or open but not a tight white globose head; spikelets often >8 mm long & often with >6 fls.
7. Glumes with midrib excurrent as a short awn.
8. Leaf blade (1 mm wide; spikelets c3-5 per spike; awn slightly curved. *Mariscus* sp. = Kuchar 16800
8. Leaf blade 2-6 mm wide; spikelets c5-20 per spike; awn straight. *Cyperus bulbosus*
7. Glumes not awned.
9. Fls 4-5 per spikelet; leaf sheaths partly chalk-white. *Mariscus* sp. nr. *vestitus*
9. Fls 8-18 per spikelet. *Mariscus amauiropus*
3. Plant tussocky or rhizomatous, stem usually not swollen basally.
10. Stem & lvs with a few hairs. *Fimbristylis dichotoma*
10. Stem & lvs glabrous.
11. Glumes with midrib excurrent as an awn.
12. Glumes (4)5-8 mm long.
13. Leaf blade (5)8-11 mm wide; spikelets terete, glumes (4)5-6 mm. *Schoenoplectus maritimus*
13. Leaf blade 2-5 mm wide; spikelets flattened, glumes 6-8 mm. *Cyperus crassipes*
12. Glumes 2-4 mm long.
14. Leaf blade 1-3 mm wide.
15. Awn of glume markedly recurved. *Cyperus rubicundus*
15. Awn of glume straight.
16. Spikelets 5-10 x 3-4 mm, each with 10-20 fls. *Cyperus poecilus*
16. Spikelets 5-25 x 2-3 mm, each with 10-30(40) fls. *Cyperus conglomeratus*
14. Leaf blade 3-12 mm wide.

17. Spikelets 4-12 per spike; plant stoloniferous  
& with small tubers. *Cyperus esculentus*
17. Spikelets 15-60 per spike; plant with short rhizome.  
*Cyperus exaltatus*
11. Glumes with acute or blunt apex, not awned.
18. Glumes 1-2 mm long.
19. Spikelets 2-4 mm long, fls up to 15 per spikelet.
20. Plant an annual to 1.5 dm high; culms triangular;  
lvs to 0.5 dm long; inflorescence bracts 3-12 cm.  
*Cyperus michelianus*
20. Plant a perennial to 5 dm high; culms terete; lvs  
1-1.5(2) dm long; inflorescence bracts only to  
1 cm. *Fimbristylis spathacea*
19. Spikelets 8-11 mm long, fls 35-60 per spikelet.  
*Cyperus* sp. = Gillett & Hemming 24743
18. Glumes 2-6 mm long.
21. Spikes 1(-3), smoothly uniformly globose or hemispheric,  
more or less white; spikelets 3-6 mm.
22. Glumes 3-4 mm long. *Kyllinga comosipes*
22. Glumes 5-6(7) mm long. *Kyllinga eximia*
21. Spikes 1 or more, may be in a tight group but  
not forming a smooth globose structure &  
generally not white; spikelets >6 mm long  
(except *Schoenoplectus roylei* & *Cyperus*  
*chordorrhizus*).
23. Plant tufted or tussocky, rhizome if present  
very short.
24. An annual; lvs absent; spikelets (?) terete.  
*Schoenoplectus roylei*
24. A perennial; lvs present; spikelets flattened.
25. Leaf blade 0.5-5 mm wide; spikelets 3-7 mm wide.
26. Spike 1, forming a more or less globose head;  
spikelets 3-7 mm wide; culms often in a straight  
line on the short rhizome. *Cyperus niveus*
26. Spikes 4-6; spikelets 3 mm wide.  
*Cyperus* sp. = Gillett et al. 22038
25. Leaf blade 5-13 mm wide; spikelets 1-2 mm wide.  
*Mariscus hemisphericus*
23. Plant with long rhizomes or stolons.
27. Rhizomes thin, black, wiry, very long; leaf blade  
at most 1.5 mm wide; spikelets 3-6(10) x 2-4 mm.  
*Cyperus chordorrhizus*
27. Rhizomes not as above; leaf blade 1.5-3 mm wide;  
spikelets 5-40 x 1-5 mm [incl. C = G 222363].
28. Spikelets 4-5 mm wide, glumes 4.5-5 mm long.  
*Cyperus ?frerei*
28. Spikelets 1-2.5 mm wide, glumes 2-4 mm long.
29. Stolons stout, not ending in tubers; culm base  
scarcely swollen; glumes 3-3.2 mm long.  
*Cyperus longus*
29. Stolons slender, often ending in small tubers;  
culm base may be swollen.
30. Spikelets yellowish-brown or rusty (brown);  
glumes 2.2-2.6 mm long, ribbed almost to

- margin. *Cyperus esculentus*
30. Spikelets reddish-brown or purple; glume  
2.2-4.5 mm long, with a wide unribbed  
marginal border.
31. Spikelets 1-1.5 mm wide; glumes 2-3 mm long,  
with a wide uncolored margin. *Cyperus maculatus*
31. Spikelets 1.5-2.5 mm wide; glumes 3-4 mm long,  
with a narrow or obsolete uncolored margin.  
*Cyperus rotundus*