

# The wild species of *Cucumis* L. (Cucurbitaceae) in South-East Asia

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## ABSTRACT

In SE Asia two wild species of *Cucumis* L. occur, of which *C. debilis* W.J.de Wilde & Duyfjes, endemic to Vietnam, is new. The second species, *C. hystrix* Chakrav., is widely distributed but not common. Both species are described and illustrated. The genus is furthermore represented by the two well-known cultivated species *C. melo* L. (the melon) and *C. sativus* L. (the cucumber); both represented with a wild variety in the area. *Cucumis debilis* is characterized by a delicate habit, long male and female pedicels, respectively (15-)20 and c. 35 mm long, and by a glabrous, almost smooth ovary.

**KEY WORDS**  
Cucurbitaceae,  
*Cucumis*,  
*C. debilis*,  
South-East Asia,  
Vietnam,  
Thailand,  
new species.

## RÉSUMÉ

*Les espèces sauvages de Cucumis L. (Cucurbitaceae) en Asie du Sud-Est.*

Deux espèces sauvages de *Cucumis* se trouvent dans le sud-est de l'Asie, dont *C. debilis* W.J.de Wilde & Duyfjes, endémique du Vietnam, est nouvelle. La seconde espèce, *C. hystrix* Chakrav., est largement distribuée, mais assez rare. Ces deux espèces sont décrites et illustrées. De plus, le genre est représenté par deux espèces cultivées bien connues: *C. melo* L. (le melon) et *C. sativus* L. (le concombre), qui sont toutes les deux représentées par une variété sauvage. *Cucumis debilis* est caractérisée par un habitus délicat, des pédicelles mâles et femelles longs, respectivement (15-)20 et c. 35 mm, et des ovaires glabres et presque lisses.

**MOTS CLÉS**  
Cucurbitaceae,  
*Cucumis*,  
*C. debilis*,  
sud-est de l'Asie,  
Vietnam,  
Thaïlande,  
espèce nouvelle.

## INTRODUCTION

*Cucumis* L. is a genus of perhaps 35 species (but see below) occurring mainly in Africa and extending with few species into SE Asia and Australia (Kirkbride 1993). For Australia, Telford (1982) lists four species as naturalized introductions and wild forms of *C. melo* L. For India, Chakravarty (1959, 1982) and Jeffrey (1980b) recognize six or seven species. In China (Jeffrey 1980a; Lu & Zhang 1986; Chen 1995) are three species: *C. melo*, *C. sativus* L., and the wild-growing *C. hystrix* Chakrav., of which the latter also occurs in northern India, Myanmar and Thailand. For the flora of Laos, Cambodia and Vietnam, Keraudren (1975) recognizes only the two cultivated species, *C. melo* (including wild forms) and *C. sativus*, which holds also for Java (Backer 1964) and the rest of Malesia. The present paper actually concerns mainly the areas of Indochina and Malesia, hence without India and China from where herbarium collections available for study are limited.

A detailed account of the whole genus *Cucumis* has been given by Kirkbride (1993), treating 32 species, of which four in Asia and Australia: *C. prophetarum* L. (Africa, N India and Pakistan), *C. melo* (widespread), *C. sativus* (extensively cultivated in E Asia, including the wild form), and *C. hystrix* (India, China, Thailand). The name *C. setosus* Cogn., published for India, was placed by Kirkbride (1993) in the synonymy of *C. sativus*, but we are not sure whether this is warranted.

Recently we found among unnamed Cucurbits in the Paris Herbarium one collection from N Vietnam of a *Cucumis*, which could not be placed in any of the known taxa in the area. It is herewith described as a new species, *C. debilis* W.J.de Wilde & Duyfjes, by which we now recognize four species in SE Asia and Malesia.

*Cucumis* L. seems most closely allied to *Cucumella* Chiov. (Chiovenda 1929) from Somalia. *Cucumella* is represented with seven species in Africa and India, and differs from *Cucumis* in its anther-thecae being straight or slightly curved only. Molecular phylogenetic research (Schaefer 2007) is of opinion that *Cucumis* in the present sense is paraphyletic and should include *Cucumella*, *Dicaelospermum* C.B. Clarke, *Mukia* Arn., *Myrmecosicyos* C. Jeffrey and *Oreosyce* Hook.f. In this

article, however, we accept *Cucumis* in its current circumscription. Full treatments of the two widely cultivated species *C. sativus* and *C. melo* are left out.

## SYSTEMATICS

Genus *Cucumis* L.

*Species Plantarum* ed. 1: 1011 (1753); *Genera Plantarum* ed. 5: 442 (1754). — J. H. Kirkbride, *Biosystematic Monograph of the Genus Cucumis (Cucurbitaceae)*: 19 (1993). — Type: *Cucumis sativus* L. (lecto-, designated by Britton & Wilson 1925: 264).

*Melo* Mill., *The Gardeners Dictionary*, abridged ed. 4, vol. 2: without pagination (1754). — Type: *Cucumis melo* L. (lecto-, designated by Swart 1960, see also Swart 1979).

## DESCRIPTION

Small or medium annual or perennial climbers (rarely suberect); monoecious (rarely dioecious); plant scabrous or setose, stem 1–4 mm diameter. Probract: absent. Tendrils: simple. Leaves: simple. Flowers: solitary or few-fascicled; pedicel short; corolla small- or medium-sized, yellow. Male flowers: receptacle-tube campanulate or turbinate, small; sepals small, mostly linear; petals united at their base, margin entire; stamens 3, free, inserted about halfway the receptacle-tube, filaments short, anthers two 2-theous, one 1-theous, thecae sinuate, 3-plicate or S-shaped, connective considerably produced apically; disc (pistillode) large, gland-like, free from the tube. Female flowers: usually solitary; ovary hairy, hairs sometimes apical on small protuberances, ovules numerous, horizontal; perianth as in male flowers but somewhat larger, stigma cupular with finger-like projections; staminodes often present, small; disc surrounding the base of style, free from the tube. Fruit: a (large) fleshy berry, indehiscent, pubescent or glabrous, or with fleshy spines or tubercles, green, yellow or orange, rarely maturing underground (*C. humifructus* Stent, southern Africa). Seeds: numerous, flat, elliptic or oblong, pale, not sculptured, unmarginated with acute edge, unwinged (or rarely winged).

## DISTRIBUTION

About 35 species in the Old World, mostly Africa, of which two species widely cultivated.

KEY TO THE SPECIES OF *CUCUMIS* L. IN SOUTH-EAST ASIA

1. Apex of leaf blade subacute or rounded. Ovary densely fine-hairy. Fruit soft hairy, glabrescent [ $x = 12$ , subgenus *Melo*, comprising the majority of the species; Africa] ..... *C. melo*  
 — Apex of leaf blade acute. Ovary glabrous or with coarse setose hairs. Fruit glabrous, aculeate or tubercled [ $x = 7$ , subgenus *Cucumis*, Asian species] ..... 2
2. Plant delicate, stem *c.* 1 mm diameter. Pedicel of male flower (15-)20 mm long. Pedicel of female flower *c.* 35 mm long (in immature fruit). Ovary glabrous, smooth or sparsely aculeate ..... *C. debilis*  
 — Plant stouter, stem (1-)2-4 mm diameter. Pedicel of male flower 2-10 mm long. Pedicel of female flower 1-20(-30) mm long. Ovary (glabrous or) hairy or setose ..... 3
3. Ovary strigose. Fruit aculeate-tubercled. Fruit apex acute. Plant growing wild ... *C. hystrix*  
 — Ovary (glabrous or) fine-hairy. Fruit glabrous or short-aculeate. Fruit apex blunt. Cultivated or escaped ..... *C. sativus*

1. *Cucumis debilis*

W.J.de Wilde &amp; Duyfjes, sp. nov.

(Fig. 1)

*A Cucumere melo in folii apice acuto, a C. sativo et C. hystrice in ovario laeve longe pedicellato, pedicello c. 3.5 cm longo distincta.*

TYPUS. — Vietnam. Tonkin, IX.1931, Pételot 2193 (holo-, P!).

## DESCRIPTION

Slender herb 1-2 m tall, presumably annual, completely covered with sparse to dense minute aculeate hairs; monoecious; stem *c.* 1 mm diameter. Tendrils: sparsely aculeate. Leaves: blade subcircular in outline, 4-7 cm diam., or 3- or 5-subangular or -lobed, base deeply cordate, apex acute (-acuminate), margin coarsely serrate-dentate, lobes broadly triangular to 1.5 cm long, with dense spiny hairs, especially along veins on lower surface, hairs 0.2-0.5 mm long, with thick raised cystoliths at base; petiole 3-5 cm long. Male flowers: solitary or 2, or 1 with a co-axillary younger female flower; pedicel (15-)20 mm long, with few minute spines; receptacle-tube turbinate to long cup-shaped, 5.5-6 × 3-3.5 mm, outside glabrous except odd aculeate spines, inside glabrous; sepals subpatent, *c.* 3 mm long, with few aculeate spines; corolla *c.* 6 mm long, lobes imbricate, elliptic, *c.* 4.5 × 3 mm, apex acute, veins outside and apex with minute stiff hairs; stamens inserted *c.* 2 mm below the throat of the receptacle-tube, included,

filaments slender, *c.* 0.5 mm long, anthers oblong, 2.5-3 × 1(-1.5) mm, connective narrow, at apex produced into a more or less flat notched appendage *c.* 0.7 mm long; disc (pistillode) large, subglobose-obovoid, *c.* 2.5 × 2.5-3 mm. Female flowers: solitary or with a co-axillary male flower; pedicel 30-35 mm long, with few *c.* 0.1 mm long aculeate hairs; perianth seen only in immature bud and as remnant at apex of immature fruit; disc a low ring. Immature fruit: solitary, fusiform, *c.* 1.1 × 0.4 cm, glabrous, except for an odd aculeate spine; fruiting pedicel (immature) 3.5-4 cm long. Seeds: not known.

## DISTRIBUTION AND PHENOLOGY

*Cucumis debilis* is endemic to N Vietnam, Tonkin, vicinity of Chapa, and known only from the type collection. The species was found in September 1931 with yellow flowers and immature fruit at an elevation of 1400 m.

2. *Cucumis hystrix* Chakrav.

(Figs 2; 3)

*Journal of the Bombay Natural History Society* 50: 869, pl. 7 (1952); *Records of the Botanical Survey of India* 17 (1): 110 (1959). — A. M. Lu & Zhi Y. Zhang, *Flora Sinica* 73 (1): 207, f. 53 (1986). — J. H. Kirkbride, *Biosystematic Monograph of the Genus Cucumis (Cucurbitaceae)*: 86 (1993). — S. K. Chen, *Flora Yunnanica* 6: 340, f. 88: 3-7 (1995). — Type: India, Assam, Garo Hills, Tura Mountain, II.1929, Parry 859 (holo-, K!).

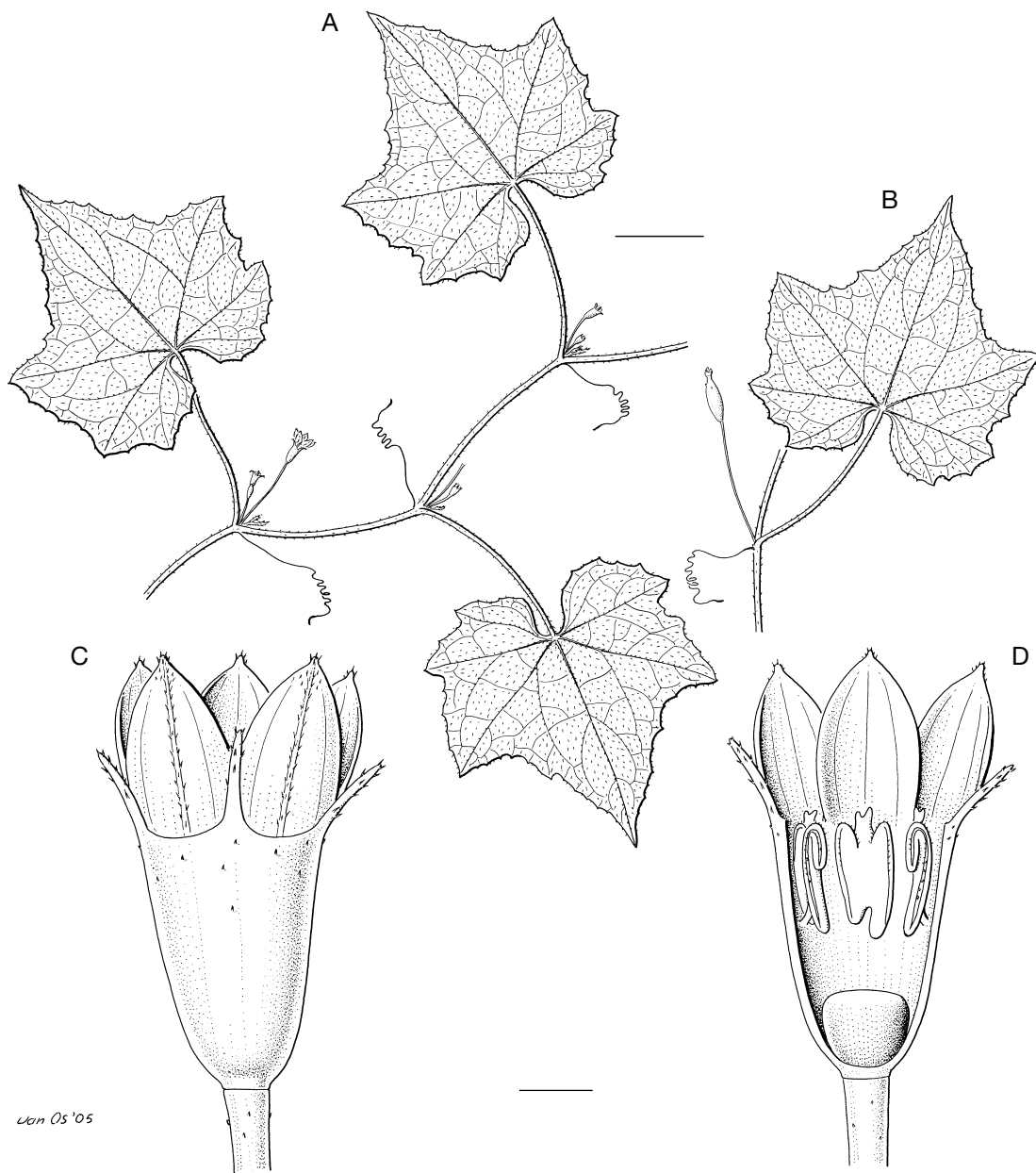


FIG. 1. — *Cucumis debilis* W.J.de Wilde & Duyfjes: **A**, twig with male inflorescences; **B**, node with young fruit, note long fruiting pedicel; **C, D**, male flower, from outside and opened respectively. *Pételot 2193*. Scale bars: A, B, 2 cm; C, D, 2 mm.

*Cucumis muriculatus* Chakrav., *Journal of the Bombay Natural History Society* 50: 869, pl. 4 (1952). — Type: Myanmar (Burma), Ruby Mines District, *Lace 6325* (holo-, E!; iso-, E!).

MATERIAL EXAMINED. — **Thailand**. Northern, Doi Chiang Dao, 9.VIII.1935, *Garrett 970* (L). — Northern, Doi Chiang Dao Animal Sanctuary, 7.XI.1995, *Maxwell 95-1106* (L). — Northern, Doi Chiang Dao, 12.IX.1967,

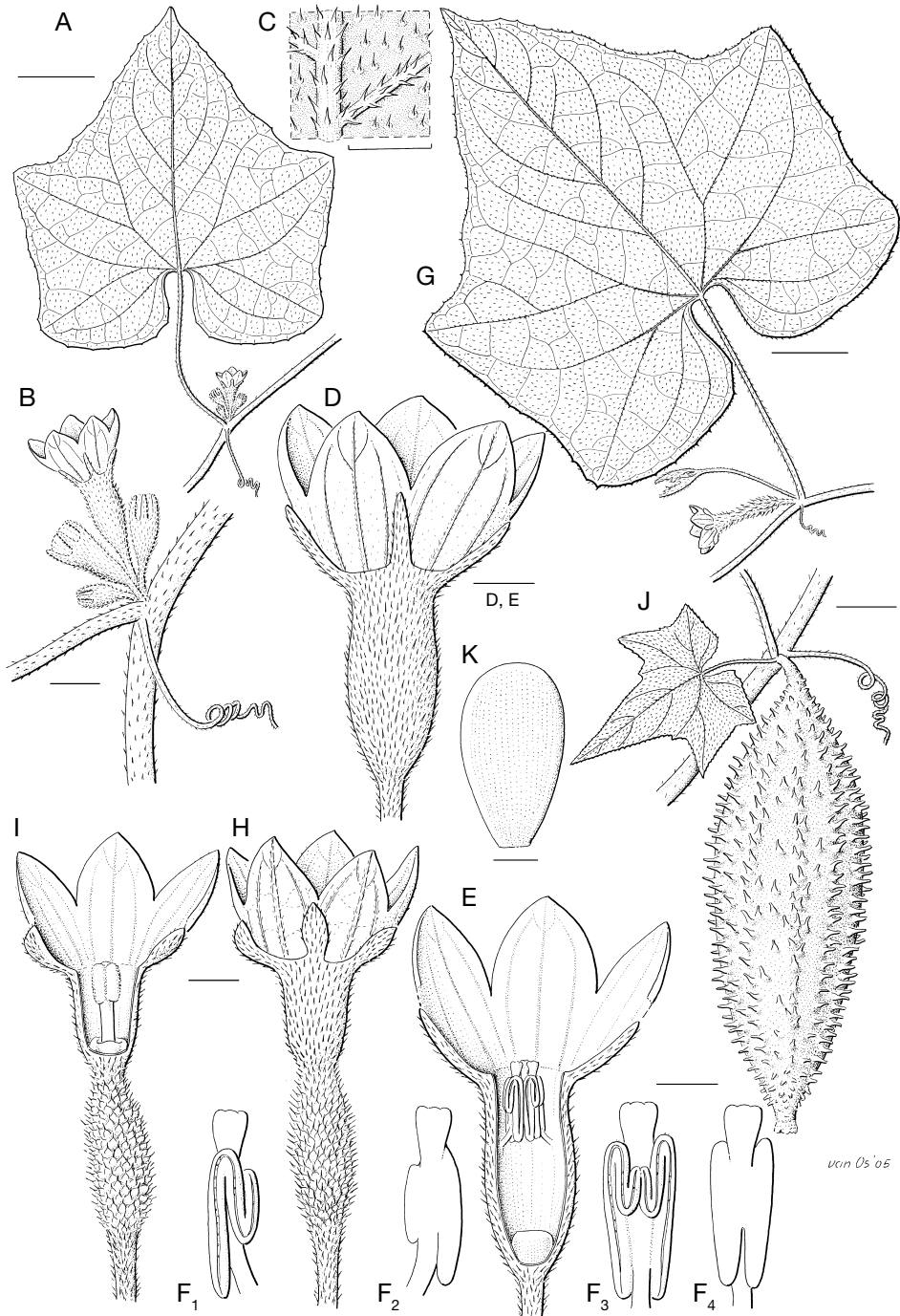


FIG. 2. — *Cucumis hystrix* Chakrav.: **A, B**, node with male inflorescence; **C**, detail of lower surface of leaf blade; **D**, male flower, just expanding; **E**, male flower, opened; **F<sub>1</sub>-F<sub>4</sub>**, stamens, seen from inside and outside respectively; **F<sub>1</sub>, F<sub>2</sub>**, one-theous stamen; **F<sub>3</sub>, F<sub>4</sub>**, two-theous stamen; **G**, node with female flower; **H**, female flower; **I**, female flower, opened; **J**, node with fruit; **K**, seed. A-F, J, K, *Phonsena, De Wilde & Duyffes* 3931; G-I, *Phonsena, De Wilde & Duyffes* 3963. Scale bars: A, 2 cm; G, J, 1 cm; B, H, I, 3 mm; C, F<sub>1</sub>-F<sub>4</sub>, K, 1 mm; D, E, 2 mm.

*Tagawa et al. T9853* (BKF). — Northern, Doi Chiang Dao, 15.IX.1967, *Shimizu et al. T10150* (BKF, L). — Northern, Doi Inthanon, 16.IX.2003, *Phonsena et al. 3931* (BKF, L). — Northern, Doi Chiang Dao Wildlife Sanctuary, 23.XI.2004, *Phonsena et al. 4463* (BKF, L). — Northern, Doi Sutep, 22.XI.1989, *Maxwell 89-1436* (L). — Northern, Doi Sutep, 29.VIII.1988, *Maxwell 88-1042* (L). — Northern, Doi Sutep, 26.XII.1987, *Maxwell 87-1638* (L). — Northern, Doi Sutep, 12.IX.1987, *Maxwell 87-985* (BKF, L). — Northern, Doi Sutep, 29.IX.1958, *Sorensen et al. 5338* (L). — Northern, Doi Chiang Dao, 9.VIII.1935, *Garrett 994* (E, L). — Northern, Doi Sutep, 26.VII.1914, *Kerr 3301* (E). — Northern, Doi Chiang Dao, 18.XI.2005, *Suddee et al. 2421* (BKF, L). — Northern, Doi Chiang Dao, 19.XI.2005, *Suddee et al. 2505* (BKF, L). — Northern, Jae Sawn, 10.VIII.1996, *Panatkool 157* (L). — Northern, Jae Sawn, 26.X.1995, *Maxwell 95-1021* (BKF, L). — Northern, Jae Sawn, 23.VIII.1996, *Maxwell 96-1119* (BKF, L). — Northern, Doi Kuhn Dahn National Park, 26.IX.1993, *Maxwell 93-1126* (L). — Northern, Doi Phu Ka, 26.XI.2005, *Phonsena et al. 4703* (BKF, L). — Northern, Doi Phu Ka, 19.IX.2003, *Phonsena et al. 3963* (BKF, L). — Northern, Doi Wao, 10.IX.1995, *Larsen et al. 46290* (L). — Northern, Doi Phu Ka, 18.IX.2003, *Phonsena et al. 3941* (BKF, L). — Northern, Khao Pha Wo, 23.VII.1973, *Murata et al. T16912* (BKF, L). — Southwestern, 12.IX.2001, *Kofman 300* (L). — Southwestern, Toong Yai Naresuan Wildlife Reserve, 7.X.1993, *Maxwell 93-1158* (L). — Southwestern, 11.XI.2004, *Pruesapan et al. 51* (BKF, L). — Southwestern, Huay Bankau, 12.XI.1971, *Van Beusekom et al. 3717* (BKF, L).

#### DESCRIPTION

Annual climber 2-6(-8) m long; wholly (setose) hairy, hairs to 3 mm long; stem (1-)2 mm diam.; monoecious. Tendrils: appressedly or patently hairy. Leaves: blade circular or ovate in outline, 5-15 cm diam., (3-)5-angular or shallowly lobed (to *c.* 1/3 deep), base deeply cordate, apex, and apices of lobes acute(-acuminate), margin regularly or irregularly serrate-dentate, both surfaces sparsely or densely finely (appressed) setose-hairy, especially on the veins; hairs brown-red or grey, mostly with thickened base, but cystoliths not obvious; petiole 1.5-8 cm long, with (appressed) downward-curved or subpatent hairs. Male flowers: 2-7-fascicled; pedicel 2-5 mm long, hairy; receptacle-tube turbinate-urceolate, *c.* 5 × 2 mm; sepals 2(-3) mm long; corolla 8-10 mm long, connate part 2-4 mm long, corolla lobes 4-6 mm long, apex (sub)acute, mid-veins setose-hairy; stamens

inserted about halfway in the receptacle-tube; filaments *c.* 1 mm long, glabrous, anthers 2-2.5 mm long, connective extension (0.5-)1 mm long; disc subglobose, *c.* 2 mm diam. Female flowers: solitary; pedicel 1-5 mm long (or longer, see the remarks), strigose; ovary narrowly ellipsoid-ovoid, 8-10 × 2-3 mm, antrorse-strigose, hairs with bulbous thickenings, grey or red-brown, *c.* 1 mm long; perianth as in male flowers, but sepals somewhat broader; style 2-3 mm long, stigma *c.* 2.5 mm long, consisting of 3 sessile carnoselobes, connate at base, lobes at apex 2-lobed, papillose; staminodes *c.* 1 mm long, inserted about halfway the receptacle-tube. Fruit: pendent, green or yellowish green, (narrowly) ellipsoid, tapering at both ends and apex shortly beaked, 3-5 × 1-2 cm, beak 2-5 mm long, aculeate tubercled by dense, soft, spine-like 2-5 mm long protuberances; fruiting pedicel 2-10 mm long (but see the remarks). Seeds: numerous, 3.5-5 × 2-2.5 mm, not ornamented, unmarginated, smooth or hairy.

#### DISTRIBUTION AND PHENOLOGY

*Cucumis hystrix* occurs in NE India (Assam), Myanmar, SW China (Yunnan), and N and W Thailand; it has not yet been found in Laos. The species has been recorded on elevations between 200 and 1800 m in scrub vegetation, along roadsides and forest edges, over granite bedrock as well as on limestone. The fruits when fresh are (yellow-) green and to *c.* 6.5 cm long.

#### REMARKS ON VARIATION

*Cucumis hystrix* is quite distinct but shows much infraspecific variation. Although the collections at hand are most numerous from Thailand, we cannot formally describe this variation as we consider that collecting is still insufficient. Variation mainly concerns 1) the length and colour of the hairs on the stems, 2) the density of the hairs on the leaf blades, 3) the character and orientation of the hairs on the petioles, 4) the length of the pedicels of female flowers and fruiting pedicels, and 5) the density of the spiny tubercles or hairs on the fruits. In Thailand we found the following:

— The hairs on the stems can be grey, yellowish or red-brown, varying in length from 1 to 4 mm.

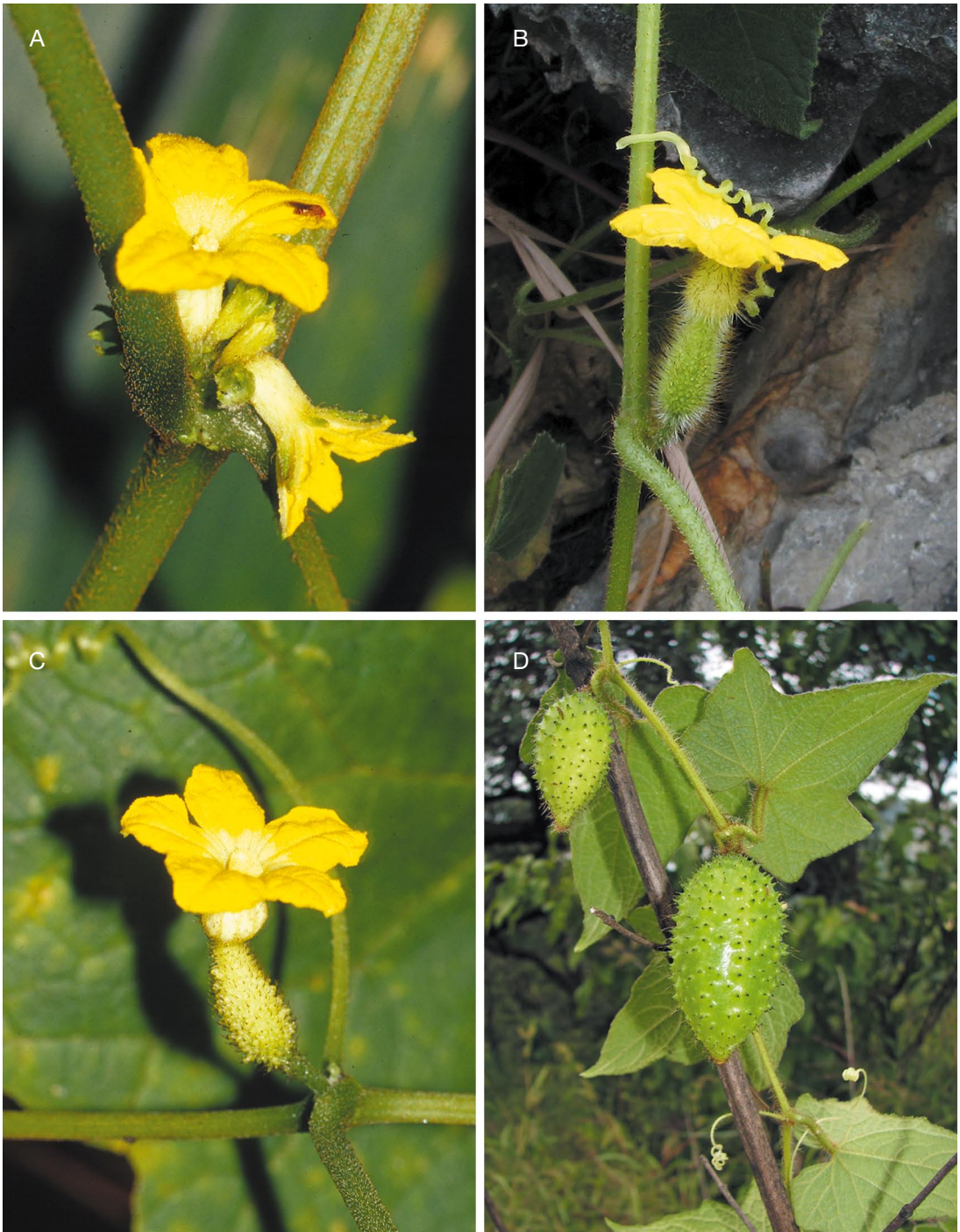


FIG. 3. — *Cucumis hystrix* Chakrav.: **A**, male flower; **B, C**, female flowers from different individuals, differing in indumentum of the ovary; **D**, fruits. A, C, Phonsena, *De Wilde & Duyfjes* 3963; B, Suddee, *De Wilde & Duyfjes* 2421; D, Suddee, *De Wilde & Duyfjes* 2505.



- The hairs on the petioles can be rather short, stiff and distinctly curved downwards, like in *Mukia javanica* (Miq.) C. Jeffrey; this is found mainly in northern Thailand. The hairs on the petioles can also be longer and weaker and generally more patent.
- The length of the pedicels of female flowers and fruiting pedicels can vary from a few millimeters to c. 10 mm. On Mt Chiang Dao, N Thailand, the fruits are mostly subsessile, while the flowers are comparatively large.
- The pedicels of the female flowers in the collection *Phonsena et al. 3941* (BKF, L) from Mt Phu Ka, N Thailand, are c. 2 cm long, while the ovaries are almost glabrous, except for a few appressed, stiff hairs, without bulbous thickenings at base, reminding us of a wild form of *C. sativus*. However, true *C. hystrix* was found not far away from the former and the plants were similar in habit. More material is needed to assess the meaning of this variation.

Chakravarty (1952: pl. 4) depicts for his *C. muriculatus* (India) – at present considered a synonym of *C. hystrix* following Jeffrey (1980a) and Kirkbride (1993) – the hairs on the petiole curved upwards, not downwards. Moreover, he depicts the anthers as being about as broad as long, whereas in *C. hystrix* from Thailand the anthers are much longer than broad. These discrepancies should be rechecked on the type of *C. muriculatus* in E.

### 3. *Cucumis melo* L.

*Species Plantarum* ed. 1: 1011 (1753). — Keraudren, *Flore du Cambodge, du Laos et du Viêt-nam* 15: 70 (1975). — C. Jeffrey, *Kew Bulletin* 34: 793 (1980b). — J. H. Kirkbride *Biosystematic Monograph of the Genus Cucumis (Cucurbitaceae)*: 79 (1993). — Type: cultivated at Uppsala, *Herb. Linn. No. 1152.8* (lecto-, designated by Meeuse 1962: 61).

*Cucumis melo* L. var. *agrestis* Naudin, *Annales des Sciences naturelles, Botanique*, sér. 4, 11: 73 (1859); 4, 12: 110 (1859). — *C. melo* L. subsp. *agrestis* (Naudin) Pangalo, *Cucurbitacées, in P. Zhukovsky, La Turquie agricole*: 534 (1933). — J. H. Kirkbride, *Biosystematic Monograph of the Genus Cucumis (Cucurbitaceae)*: 81 (1993). — Type: cultivated at Paris from seeds from India, *Naudin s.n.* (lecto-, P; isolecto-, P, designated by Kirkbride 1993: 105).

### REMARKS

*Cucumis melo*, the most variable species in *Cucumis*, originates from Africa (Renner *et al.* 2007) and is at present cultivated all over the world. The small-fruited wild and weedy var. *agrestis* Naudin likewise is widely distributed in the Old World, viz. Africa, Asia (India) and Australia, including the monsoon area on poorer soils in Malesia and possibly in Indochina. The variety *agrestis* is distinguishable by having appressed hairs on the ovary and 2–5 cm long fruit; in specimens of the cultivated var. *melo* (with numerous cultivars) the hairs on the ovary are spreading (Kirkbride 1993: 80).

Recently *Cucumis bisexualis* A.M. Lu & G.C. Wang (1984), with hermaphroditic flowers and small fruits has been described from a single collection from northern China. Its status as species very close to *Cucumis melo* is disputable.

### 4. *Cucumis sativus* L.

*Species Plantarum* ed. 1: 1012 (1753). — Keraudren, *Flore du Cambodge, du Laos et du Viêt-nam* 15: 71 (1975). — J. H. Kirkbride, *Biosystematic Monograph of the Genus Cucumis (Cucurbitaceae)*: 84 (1993). — Type: cultivated, *Herb. Burser XVII: 97* (lecto-, UPS, designated by Ten Pas *et al.* 1985: 290).

*Cucumis sativus* L. var. *hardwickii* (Royle) Alef., *Landwirtschaftliche Flora*: 196 (1866). — C. Jeffrey, *The Cucurbitaceae of Eastern Asia*: 23 (1980a). — J. H. Kirkbride, *Biosystematic Monograph of the Genus Cucumis (Cucurbitaceae)*: 86 (1993). — *Cucumis hardwickii* Royle, *Illustrations of the Botany of the Himalayan Mountains* 1: 220 (1839); 2: pl. 47: 3 (1839). — Type: *Royle s.n.* (LIV, not seen).

### REMARKS

The origin of the cultivated, very variable, *Cucumis sativus* with numerous cultivars is unknown, but possibly it is from northern India, the same area as the wild variety, var. *hardwickii*, which is supposed to be the ancestor of cultivated cucumbers.

Four species names of *Cucumis* and one variety from SE Asia have been placed in the synonymy of *C. sativus* by Kirkbride (1993), i.e. *C. hardwickii* Royle (1839), *C. muricatus* Willd. (1805), *C. rumphii* Hassk. (1866), *C. setosus* Cogn. (1881), and *C. sativus* L. var. *sikkimensis* Hook. f. (1876).



We agree with this synonymy, except for *hardwickii* which we retain as the wild variety. Furthermore, we are not sure that the inclusion of *C. setosus* is warranted. This latter species is known by only two old collections from NW India, with the habit strongly deviating from *C. sativus*, and we feel that this needs further study.

*Cucumis sativus* var. *hardwickii*, the wild variety, was accepted by Jeffrey (1980a) and Kirkbride (1993) as occurring in NE India, Nepal, S China, Myanmar and Thailand, but we cannot confirm its occurrence in Thailand. Records of wild growing mostly sterile specimens from Thailand, identified by Kirkbride (1993) as *C. sativus*, appear to represent sterile *C. hystrix*.

Plants of *C. sativus* var. *hardwickii* are generally distinct in being more delicate, with bitter fruits, but appear to link up in their morphological characters with the cultivated var. *sativus* (with many cultivars). However, the two botanical varieties have their own isozyme patterns (Knerr & Staub 1991; Kirkbride 1993: 86).

According to Kirkbride (1993) the length of the female flower- and fruiting-pedicel in *C. sativus* is 2-18(-20) mm and 1.5-3 cm respectively. However, specimens annotated as spontaneously growing in a garden in S India, from an unknown collector, 2030 b (L), 2050 (L, W), and 2050 a (L) and identified by Kirkbride in 1991 as *Cucumis sativus* L., all have c. 6 cm long female flower- and fruiting-pedicels. The status of these deviating specimens remains uncertain.

### Acknowledgements

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