

THE TRIBE SOLANEAE (SOLANACEAE): KEY FOR ITS GENERA AND DESCRIPTION OF *DARCYA* GEN. NOV.

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Summary: After a key to identify the 32 genera included in the tribe Solaneae G. Don (subfam. Solanoideae), follows the description and illustration of the new monotypic genus *Darcya*, growing in the oriental rain forests of Peru and Bolivia.

Key words: taxonomy, Solanaceae, Solaneae, key for the genera, *Darcya*.

Resumen: La Tribu Solaneae (Solanaceae): Clave para sus géneros y descripción de *Darcya* gen. nov. Luego de una clave diferencial para los 32 géneros que el autor considera válidos en la tribu Solaneae G. Don (Subfam. Solanoideae), se describe e ilustra el nuevo género monotípico *Darcya*, propio de la selva pluvial del oriente de Perú y Bolivia.

Palabras clave: taxonomía, Solanaceae, Solaneae, clave de los géneros, *Darcya*.

THE TRIBE SOLANEAE: KEY FOR ITS GENERA

Solaneae G. Don is one of the nine tribes of Subfam. Solanoideae Schlecht. Its diagnostic characters are: a) crystal sand present, b) corolla aestivation valvate, valvate-induplicate, valvate-plicate, or valvate-conduplicate, c) filaments straight, d) anthers usually dorsifixed, dorsi-basifixed or

basifixed (with 3 exceptions: *Jaltomata*, *Cuafrisia* and *Withania*, with ventrifixed or ventri-basifixed anthers), e) pollen grains spineless, f) gynoeceum bicarpellate and ovary bilocular, g) fruit: berry, h) embryo arcuate, annular, subcoiled or coiled, the cotyledons shorter than the rest of the embryo, i) producing frequently steroidal, indolic or tropane alkaloids (but never hyoscyamine or hyoscyne).

It includes 32 genera; the following key is intended to help in their identification:

1. Filaments basally united in a uniform and continuous ring fused to the basal border of the corolla; connective thickened at the dorsal face of the anther. Ovary without a nectary. Anthers basifixed, with longitudinal dehiscence
2. Anthers with their apices sterile (this sterile sector includes 1/3 up to 1/2 of each anther), joined together in a column (thanks to 4 rows of trichomes—two adaxial and two lateral, strongly interlaced); dehiscence longitudinal
 1. *Lycopersicon* Miller
- 2' Anthers fertile from base to apex, usually free from each other (rarely fused totally or in part—*Solanum* sect. *Afrosolanum*—, or clinging together—*Solanum* sect. *Cyphomandropsis*), usually glabrous (by exception with very minute trichomes that are not able to interlace); dehiscence by terminal pores or slits
3. Calyx divided in lobes or in segments
 4. Connective forming a dorsal layer of uniform thickness (evident only with transversal sections), lacking humps or emergencies. Anther dehiscence sometimes by a terminal pore, usually by a pore and slit
 5. Stamens free or united by their anthers or filaments; anthers generally equal or sometimes with two different sizes, usually straight (exception *Solanum pennelli*, with 5.5-7 mm long curved anthers of three different sizes with equal thecae), not horned, 2-5 (8) mm long. Corolla stellate or rotate

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6. Berries usually juicy or pulpy, with the pericarp thick, many-layered and many-seeded. Seeds discoidal, compressed, 1.5-3 (4) mm long. Inflorescences varied, but never monochasial biflowered cymes

2. **Solanum** L.

- 6'. Fruits apparently dry, its pericarp very thin (ca. 6 layers of cells). Seeds 4-8, reniform to subglobose, 5-5.5 mm long. Inflorescence in monochasial biflowered cymes

3. **Triguera** Cav.

- 5'. Stamens free; anthers of three different sizes: the smallest one (3-4.5 mm long), not horned, the four others, horned, sinously curved and with unequal thecae of two sizes: 6.5-8.5 mm long and 8.5-11 mm long. Corolla rotate

4. **Normania** Lowe

- 4'. Connective surface irregular, its thickness much evident, in general with an emerging hump. Anther dehiscence exclusively through a terminal pore

5. **Cyphomandra** Sendt.

- 3'. Calyx undivided, with five to ten linear nerve prolongations, emerging from its border. Anther dehiscence through a pore and a slit

6. **Lycianthes** (Dunal) Hassler

- 1'. Filaments usually not united in a continuous basal ring, each one inserted independently to the corolla. Connective not thickened at the dorsal face of the anther. Ovary with a basal nectary. Anthers dehiscing longitudinally, ventrifixed or ventri-basifixed (three genera) or usually basifixed, dorsifixed or dorsi-basifixed

2. Anthers extrorse, ventrifixed or ventri-basifixed

3. Pedicels articulated on long or short umbeliform inflorescences. Corolla glabrous within, of various colours and forms: infundibuliform, tubular, campanulate or rotate, usually 10-lobed with five larger lobes alternating with five small lobules. Stamens exerted. Calyx 5-lobed or 5-parted

7. **Jaltomata** Schlecht.

- 3'. Pedicels not articulated. Corolla generally greenish, yellowish or white, glabrous within or with tufts of trichomes, always 5-lobed. Stamens included

4. Flowers always perfect; corolla usually glabrous within (exception: *C. cuspidata* with a belt of a few simple trichomes at an upper level of the insertion of the filaments). Calyx with its border usually entire at anthesis. Pericarp lacking sclerosomes. Neotropical plants of humid lowland forests, from Guatemala to eastern Bolivia

8. **Cuatresia** Hunz.

- 4'. Flowers perfect or by exception dioecious; corolla usually with tufts of branched or dendroid trichomes inside. Calyx sometimes 5-apiculate, shortly dentate or more frequently divided. Pericarp with few sclerosomes. Plants from the Old World, from southern Spain to China and Japan

9. **Withania** Pauq.

- 2'. Anthers introrse, dorsifixed, basifixed or dorsi-basifixed

3. Ovary semiinferous. Anthers sessile or subsessile. Perianth 4-merous

10. **Nothoecstrum** A. Gray

- 3'. Ovary superior. Filaments short or long, at least longer than half an anther. Perianth usually 5-merous

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4. Calyx undivided; sometimes its five main nerves surpass the superior smooth border as cylindrical or dentiform appendices
5. Corolla tube generally with an inside belt of trichomes slightly over the filaments insertion. Pericarp usually with sclerosomes

11. **Witheringia** L'Hér.

- 5'. Corolla tube interiorly glabrous. Pericarp lacking sclerosomes
6. Stipet auriculate. Calyx frequently with 5 or 10 appendices or teeth prolonging the nerves. Aestivation valvate-plicate. Placenta and endocarp never fusing, with a space in-between

12. **Capsicum** L.

- 6'. Stipet not auriculate. Upper border of the calyx unadorned, smooth, lacking nerve prolongations. Aestivation valvate (tube without plaits). Placenta enlarged centrifugally fusing with the endocarp, no space in-between

13. **Tubocapsicum** (Wettst.) Makino

- 4'. Calyx divided in its upper border
5. Aestivation valvate (corolla tube lacking plaits)
6. Corolla lobes short, the gamopetalous sector always larger
7. Corolla urceolate-campanulate or campanulate-infundibuliform. Anthers dorsifixed. Calyx not accrescent
8. Corolla urceolate-campanulate. Style covered by antherose trichomes

14. **Discopodium** Hochst.

- 8'. Corolla campanulate-infundibuliform. Style glabrous

15. **Acnistus** Schott

- 7'. Corolla infundibuliform. Anthers basifixed. Calyx accrescent, slightly or much inflated, surrounding completely the berry

16. **Deprea** Raf.

- 6'. Divisions of the corolla as long as the gamopetalous sector or slightly longer
7. Hairy filaments shorter than the anthers, inserted near the middle of the gamopetalous sector of the corolla. Calyx accrescent

17. **Brachistus** Miers

- 7'. Filaments glabrous, shorter or longer than the anthers, inserted at the basal border of the corolla
8. Herbs or shrubs. Calyx membranous, much accrescent, enveloping tightly the berry. Styles long, in all the flowers with the same length. Stamens frequently unequal in the same flower

18. **Larnax** Miers

- 8'. Shrubs or trees. Calyx rather thick, not accrescent or, if accrescent, surrounding the berry completely or in part, but always open upwards. Styles heteromorphic in the same plant. Stamens equal

9. Shrubs. Calyx almost dialisepalous (the gamosepalous sector very short or sometimes negligible), accrescent (surrounding the berry) completely or only in part, but always open upwards

19. **Athenaea** Sendt.

- 9'. Shrubs or small trees (up to 8 m high). Calyx with an evident basal gamosepalous sector, not accrescent

20. **Aureliana** Sendt.

5'. Aestivation valvate-induplicate, valvate-plicate or valvate-conduplicate.

6. Corolla infundibuliform or tubular-infundibuliform

7. Herbs generally small or pigmy (3-20 cm high) with capsular fruits. Stamens unequal

8. Calyx with equal lobes. Corolla 20-40 mm long, its lobules reduced to barely five angles

21. **Exodeconus** Raf.

- 8'. Calyx with unequal lobes. Corolla 5-8 mm long, with well developed lobules

22. **Oryctes** S. Watson

7'. Woody plants comparatively larger with baccate fruits. Stamens usually equal

8. Stapes large, much developed, with conspicuous appendices and lateral wings. Style mesogynous. Flowers perfect or functionally dioecious

23. **Dunalia** Kunth

- 8'. Stapes not prominent, lacking apical appendices or lateral wings. Style terminal. Flowers perfect

9. Young stems with deciduous brown-coloured trichomic emergencies. Filaments inserted at the basal border of the corolla tube. Calyx not accrescent

24. **Saracha** Ruiz et Pav.

- 9'. Young stems smooth, lacking trichomic emergencies. Filaments inserted between 1/4 and 3/4 of the corolla-tube. Calyx slightly accrescent

25. **Ioichroma** Benth.

6'. Corolla rotate or campanulate-rotate

7. Corolla usually with an inner ring of trichomes at a level slightly above the staminal insertion. Free sector of the filaments longer than the anthers; stapes usually not auriculate

8. Herbs. Calyx much accrescent. Style submesogynous or mesogynous

9. Fructified calyx urceolate, inflated, bladdery, usually closed or with a small apical opening, hiding the berry completely

10. Aerial parts with a granular aspect, being covered almost completely by vesiculose, withish, aquifer trichomes (their big globose head is verrucose, and the thin stalk has two to four cells). Pericarp unevenly thickened; at maturity it desintegrates, almost completely breaking at the thinnest and weakest areas

26. **Quincula** Raf.

- 10'. Aerial parts lacking vesiculose aquifer trichomes, but with simple, branched or stellate trichomes. Pericarp with an uniform thickness, at maturity never desintegrating

27. **Physalis** L.

- 9'. Fruits not inflated nor bladdery, its calyx surrounding in part the berry, open upwards and laterally
10. Corolla (15) 20-24 mm long, 20-50 mm in diameter; aestivation valvate-induplicate; anthers 2.8-3.5 (4) mm. Pericarp generally juicy, with sclerosomes. Calyx with tertiary connecting nerves originating a dense reticulum, its glandular trichomes with a unicellular head

28. *Leucophysalis* Rydb.

- 10'. Corolla 4-9 mm long, (5) 10-20 (30) mm in diameter; aestivation contorted-plicate; anthers 0.6-2.5 mm. Pericarp generally dry lacking sclerosomes. Calyx with thin and tenuous tertiary connecting nerves, its trichomes simple or branched, not glandular

29. *Chamaesaracha* (A. Gray) Benth. & Hook.

- 8'. Small trees. Style terminal

30. *Eriolarynx* Hunz. gen. nov.²

- 7'. Corolla glabrous inside. Free sector of the filaments more or less equilong or slightly longer than the anthers; staped auriculate. Style mesogynous
8. Trees. Calyx not accrescent (or very slightly), never surpassing the half of the berry. Corolla 5-lobate (lobes oblong or short and wider than long)

31. *Vassobia* Rusby

- 8'. Herbs. Calyx much accrescent tightly enveloping the berry. Corolla lobes inexistant, reduced to five hairy angles

32. *Darcya* Hunz. gen. nov.

***DARCYA*, A NEW GENUS OF THE
TRIBE SOLANEAE**

On occasion of making a critical revision of the genera of Solaneae, one of its results has been the necessity of describing a new genus, belonging to the subtribe Capsicinae Yamazaki; its description follows:

***DARCYA*³ Hunz. gen. nov.** (Fig. 1).

Herbae annuae, viscidae, erectae, 0.5-1.5 m high, ramosae; indumentum conspicuum: rami ramulique et folia, pedicelli et calyces cum trichomatibus multicellularibus praecipue glandularis (plerumque pedibus longis, capitibus roseis, unicellularibus vel pluricellularibus).

Laminae ovatae vel ovato-oblongae. Inflorescentiae fasciculatae; flores 7-10, pedicellis tenuibus, erectis vel curvis; calyx 5-dentatus, dentes triangulares leviter inaequales, tubum superantibus, corolla tenuissima, rotata vel rotato-campanulata, actinomorpha, 5-angulata, intra glabra, alba cum maculi purpureis vel flavis, tubo brevi, androecium homomorphum, antherae basifixae vel basidorsifixae, filamentis glabris paulo brevioribus, connectivum prominente, stapedum conspicuum; nectarium annulare, inclusum; stigma discoidale-capitato, depresso, bilobato; stylus obsubulatus, submesogynous. Baccae globosae, leviter depressae, erectae vel pendulae, multiseminatae, pericarpio aurantiaco vel scarlatino, tenui, cum sclerosomatibus et calyce accrescenti tenuique arcte circumdato. Semina parva, favosa; embryo annularis, endospermium satis abundanti.

²The description of this genus is in press (*Kurtziana* 28, 2000).

³In honour of the late William G. D'Arcy, the well known solanologist, whose dedicated efforts to improve our knowledge of the family, allowed the solution of many problems in its taxonomy and nomenclature.

Type species: *Darcya spruceana* (Hunz.) Hunz. (= *Physalis spruceana* Hunz., *Kurtziana* 1: 208, f. 1. 1961).

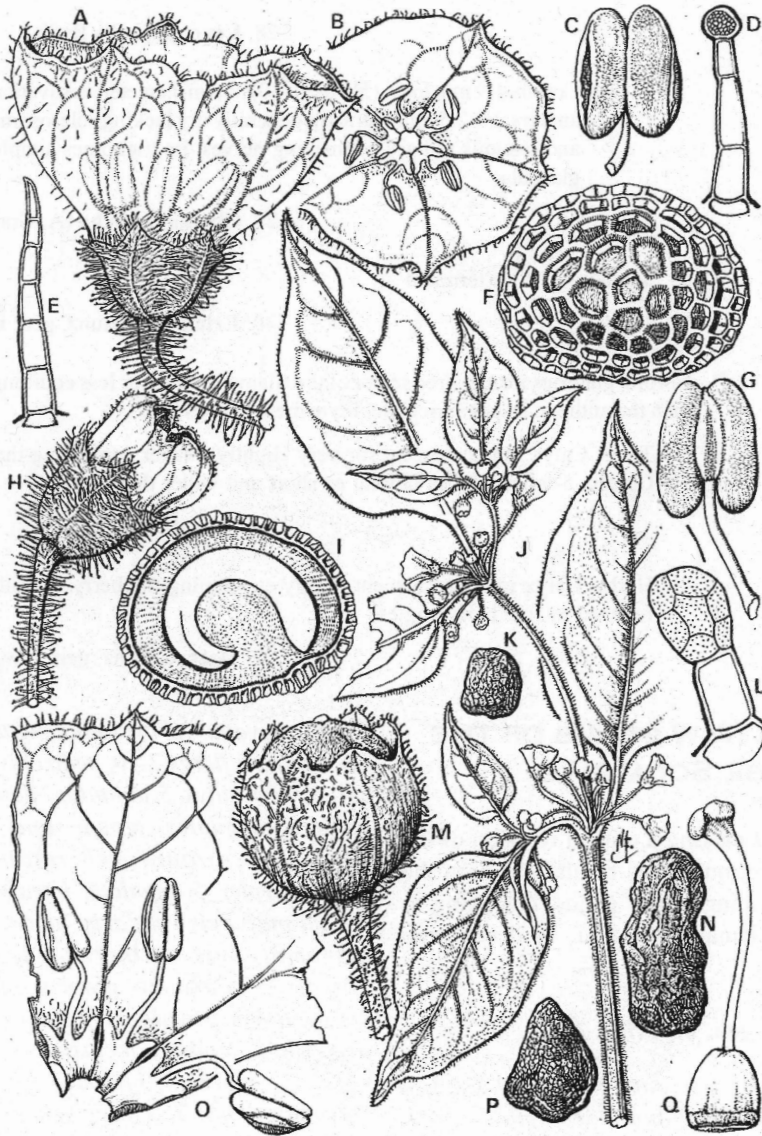


Fig. 1. *Darcya spruceana* (branchlet: Mexia 6340; seeds and sclerosomes: Soukup 4383; the rest: Wurdack 2256). A: lateral view of a flower, x 6,6; B: top view of corolla, x 2,5; C, G: anther, ventral and dorsal views respectively, x 8,3; D, E: calyx trichomes, x 166; J: branchlet, x 0,83; F, I: seed (lateral view and longitudinal section), x 41,5; H: flower bud, x 5; K, N, P: pericarp sclerosomes, x 16,5; L: trichome of the abaxial leaf surface, its head multicellular, x 291; O: inner view of corolla sector, x 8,3; M: fruit, x 5; Q: gynoecium, x 8,3. Drawn by N. de Flury.

Erect annual sticky herbs, 0,5-1,5 m high, much branched; indument conspicuous: young branches, leaves, pedicels and calyces with pluricellular trichomes, the majority of glandular nature, usually with long stalks, their globose rose-coloured head, 1-cellular or pluricellular. Leaf blades ovate or oblong-ovate, the minor ones 2,8-3,9 x 1,5-2,4 cm, the larger ones 6-8 (14) x 2,9-4,8 (9,5) cm, petioles 0,5-1,8 cm. Inflorescences fasciculate, flowers 7-10, pedicels thin, erect or curved, 5-9 (55) mm long; calyx ca. 2 mm long, 5-toothed, teeth triangular, slightly unequal in size, somewhat broader than long, shorter than the tube; corolla rotate or rotate-campanulate, 5-angulate, tube very short, limb lacking a trichomatic ring in the inside, very delicate, ca. 10 mm in diameter during anthesis, ca. 5 mm long, white with purpur or yellow spots; anthers basifixed or basi-dorsifixed, ca. 1,3 mm long, slightly shorter than the glabrous filaments, thecae free from each other between their basal 1/3 and 1/4, connective prominent, staped conspicuous, their lateral outgrowths, up to 1 mm long, fused to the corolla; ovary somewhat elongated, ca. 1 mm long, nectary annular, included, stigma discoidal-capitate, depressed, bilobed, style obsubulate, submesogynous: Berries globose, somewhat depressed, erect or pendent, 4-5 mm in diam., many-seeded (80-100 seeds per fruit), pericarp flame-scarlet or orange, thin, not fleshy, with sclerosomes, tightly surrounded by the accrescent tenuous calyx, excepting its upper surface. Seeds small, ca. 0,75 mm long, episperm honey-combed; embryo annular, cotyledons shorter than the

rest of the embryo, endosperm moderately abundant.

Illustration and references.- Hunziker (1961: 208, f. 1; sub nom. *Physalis*); Brako & Zarucchi (1993: 1259, sub nom. *Brachistus*).

Monotypic genus; the type species is very peculiar, growing in the oriental rain forests of Peru (Amazonas, Ayacucho, Huanuco, Junin, Loreto, Madre de Dios, San Martín) and Bolivia (La Paz, Pando), between 150 and 1100 m high.

The closest relationships of *Darcya* are with *Capsicum*, *Physalis*, *Brachistus*, *Chamaesaracha* and *Leucophysalis*. On account of its corolla, the affinities with *Physalis* and above all with *Capsicum* are evident; but the fruits of both genera are very different: the inflated usually urceolate 5-lobate calyx of *Physalis*, the undivided not accrescent one of *Capsicum* and the absence of sclerosomes in the pericarp easily differentiate them. The pericarp of *Darcya* has sclerosomes like *Brachistus*, but the corolla of the last genus is campanulate and 5-cleft and not rotate; besides, the staped of *Brachistus* is very different to the one of *Darcya*. Comparing *Darcya* with *Chamaesaracha*, although their fruits are somewhat similar, the conspicuous staped of *Darcya*, its pericarp with sclerosomes and its small seeds, leave no doubt about the distinctiveness of both genera.

The following chart summarizes the preceding data:

	<i>Darcya</i>	<i>Capsicum</i>	<i>Physalis</i>	<i>Brachistus</i>	<i>Chamaesaracha</i>	<i>Leucophysalis</i>
Calyx	5-lobulate	Undivided	5-lobate	5-fide	5-lobate	5-parted
Corolla	Rotate or rotate-campanulate, glabrous inside	Rotate or rotate-campanulate, glabrous inside	Rotate or rotate-campanulate, with an inner trichomic ring	Campanulate 5-fidus, with an inner belt of trichomes	Rotate, with trichomes in its interior	Rotate or rotate-campanulate, with an inner ring of branched trichomes
Staped	With 2 lateral outgrowths	With 2 lateral outgrowths	Lacking lateral outgrowths	Lacking lateral outgrowths	Lacking lateral outgrowths	Lacking lateral outgrowths
Fruit	Calyx accrescent surrounding tightly the berry	Calyx not accrescent	Calyx accrescent inflated, usually almost closed	Calyx accrescent surrounding the berry, open	Calyx accrescent surrounding the berry, open	Calyx accrescent surrounding the berry, open
Pericarp	With sclerosomes	Lacking sclerosomes	With or without sclerosomes	With sclerosomes	Lacking sclerosomes	With sclerosomes

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