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Notes on the Scrophulariaceae of Sri Lanka*

by

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(With one text figure)

The present paper is intended to be supplementary to the author's revision of the Scrophulariaceae of Ceylon.

In keeping with British tradition, Trimen in his Handbook of the Flora of Ceylon followed Bentham and Hooker's scheme of classification of this family (Gen. Pl., 1876). An improved version of this scheme was that of von Wettstein (Pflanzenfam., 1895). Both schemes, though following the same general lines of division into subfamilies and tribes, were based chiefly on microscopic characters. The keys thus formed, though very reliable, prove inconvenient of use in the field. Whilst appreciating the merits of Trimen's key to the genera the author's treatment of the family has deviated from this and based its key mostly on macroscopic characters in an attempt to facilitate identification in the field. (For Key to the Genera see author's revision of the family.)

NOMENCLATURAL CHANGES AND FIELD OBSERVATIONS

Abeywickrama (Provisional Check List of the Flowering Plants of Ceylon, 1959) made a useful survey of plant names. Subsequently, on closer examination of material, especially in the field, and for valid nomenclatural reasons a further clarification of some of these names becomes necessary for the Scrophulariaceae. They have been brought up to date in accordance with the International Code whilst the corresponding ones followed by Abeywickrama in his Check List have been reduced to synonymy.

Verbascum chinense (L.) Santapau, Fl. Purandhar 90, 1958.
V. coromandelianum (Vahl) Kuntze, Rev. Gen. Pl. 1 : 468, 1891.

The only collection seen of this species is that of Gardner (*C. P. 2021 & 2041* - PDA). Since Gardner's time the plant has not been recollected. Trimen himself noted that he had seen only the C. P. collections of Gardner. The author made a special trip to the island of Delft where Gardner first collected the plant. No trace of it could be found; and it was disappointing to note the herds of cattle and goat which graze untended in the island, in addition to those of wild ponies. It may well be, consequently, that this taxon is no longer represented in the island.

* Critical Notes on Ceylon Plants. XIV.

Pedicularis zeylanica Benth., Scroph. Ind. 54, 1835 & in DC., Prodr. 10:580, 1846.

Flowering: August - February.

This plant usually grows in association with *Satyrium nepalense* D. Don and at first sight might be mistaken for this orchid in the field. The two plants grow up to about the same height and resemble each other in the size and colour of the corollae. But P. *zeylanica* can easily be distinguished from the orchid in the lobed leaf margins and its scrophulariaceous corolla. About April, after fruiting, the plant withers and does not appear again till shortly before the next flowering season.

Centranthera indica (L.) Gamble, Fl. Madr. 971, 1921; Santapau, Fl. Khandala 184, 1967.
C. hispida R. Br., Prodr. 438, 1810.

For a long time this species was considered distinct from *C. hispida.* The reason for the distinction is the variability of its forms especially in the colour of the corolla and the pubescence of the filaments. *C. indica* was considered to have a white corolla and *C. hispida* a purple or rose-coloured one. Close observations in the field, however, revealed that such colour differences are not constant. Pubescence of the pairs of filaments has also been used as a basis of distinction, *C. indica* being pilose in both pairs of filaments and *C. hispida* in only one pair. Pubescence, however, is variable in both species. Trimen has even a minor difference of length in the calyx as a ground of distinction between the two species; but this is also a variable character. The author, therefore, has followed Santapau (loc. cit.) in merging *C. hispida* under *C. indica.*

Striga angustifolia (D. Don) Saldanha in Bull. Bot. Surv. Ind. 5 (1): 70, 1963.
Buchnera angustifolia D. Don, Prodr. Fl. Nep. 91, 1825.
S. asiatica (L.) O. Kuntze, Rev. Gen. Pl. 2 : 466, 1891, p. p.

The name *Buchnera asiatica* L. recombined as *Striga asiatica* has been used by various authors to denote different species of *Striga*, such as *S. lutea* Lour., *S. densiflora* (Benth.) Benth., and *S. euphrasioides* (Benth.) Benth. Both the Linnaean name and its combination, therefore, each fall under censure of the Code as being "a long-persistent source of error." (Art. 79). Owing to the illegitimacy of the combination *Striga asiatica* the oldest legitimate epithet available for our species, then, is in *Buchnera angustifolia.*

Lindernia crustacea (L.) F. Muell., Cens. Austral. Pl. 97, 1882.

The entire plant is glabrous and the flowering calyx distinctly ribbed. Very common in paddy fields after the harvest, in moist places and lawns up to ± 500 m.

"Based upon *Capraria crustacea* Linn. of Amboyna this Oriental plant has had a disturbed taxonomic history, having been placed successively in *Torenia*, *Vandellia* and *Lindernia*...." (Pennell, Scroph. East. N. Amer. 139, 1935).

Lindernia anagallis (Burm. f.) Pennell in J. Arn. Arb. 24 : 252, 1943 & in Acad. nat. Sci. Philad. Monogr. 5 : 31, 1943.
Ruellia anagallis Burm. f., Fl. Ind. 135, 1768.
Gratiola cordifolia Colsm., Prodr. Desc. Grat. 15, 1793.
L. cordifolia (Colsm.) Merr., Enum. Philipp. Pl. 3 : 437, 1923.

For quite a long time this species went under the name of *L. cordifolia.* On tracing the Kelinof material, the type of *Ruellia anagallis,* Philcox (Kew Bull. 17 (3): 484, 1964) found that *R. anagallis* actually differs from *R. antipoda* with which it was formerly considered conspecific. The former species, besides, more closely matches the description of *Gratiola cordifolia* and is, therefore, conspecific with it. Since *R. anagallis* Burm. f. is antedated, the correct combination is the one given above.

This plant usually grows in association with *Lindernia rotundifolia* (L.) Alst.

Lindernia antipoda (L.) Alst. in Trim., Handb. Fl. Ceyl. 6 : 214, 1931 & Kandy Fl. 59, f. 316, 1938 (excl. syn. *Ruellia anagallis* Burm. f.).

This is about the most widespread species of *Lindernia* in Sri Lanka, occurring in the wet and dry lowlands and in the wet hill country up to ± 550 m. It has forms which at first sight might be mistaken for distinct taxa on account of their variable habit, size of leaves, length of inflorescence and colour of corolla. In wet habitats the stem is generally prostrate, the leaves large, the racemes short and the colour of the corolla a pale mauve, deep purple or pink. In dry habitats, however, as in paddy fields after harvest, the stem tends to be more erect, the leaves small, the racemes longer and the colour of the flowers a pale blue.

Bacopa floribunda (R. Br.) Wettst. in Engl. & Prantl, Pflanzenfam. 4 (3b):77, 1891.
Mella floribunda (R. Br.) Pennell in J. Arn. Arb. 24 : 248, 1943.

For some time a lot of confusion prevailed about the generic name. Not a few names claimed recognition, such as *Moniera* B. Juss. ex P. Browne, *Herpestis* Gaertn., *Bacopa* Aubl. and *Mella* Vand. The confusion was ended by *Bacopa* being made a *nomen conservandum.* Hence *M. floribunda* must be reduced to synonymy.

Bacopa monnieri (L.) Pennell in Proc. Acad. nat. Sci. Philad. 98: 94, 1946.
B. monnieria (L.) Wettst. loc. cit.

A very common plant occurring at times along the sea shore. In marshy areas of the lowlands it is a gregarious species often extending as a mat on the ground. The corolla generally has a pale blue tinge, and very occasionally is pure white.

Adenosma indianum (Lour.) Merr. in Trans. Amer. Phil. Soc. n. s. 24 (2): 351, 1935.
A. capitatum (Benth.) Hance in J. Linn. Soc. Lond. Bot. 13 : 114, 1873.

The flower has the general appearance of one of the Labiatae; but in the field its scrophulariaceous indentity becomes evident from the very divided nature of the calyx lobes and the capsular fruit. A fairly common weed in cinnamon estates of the wet lowlands with a preference for sandy soil.

NEW RECORDS

Lindernia nummularifolia (D. Don) Wettst. in Engl. & Prantl, Pflanzenfam. 4 (3b) : 79, 1891.
Vandellia nummularifolia D. Don, Prodr. Fl. Nep. 86, 1825.

This species is closely allied to the more common *L. rotundifolia* (L.) Alst. but is distinguished from the latter as follows:

1. Flowering calyx cleft to base; perfect stamens 2; capsule ovoid-globose, up to 3.5 mm long ..... *L. rotundifolia*
1. Flowering calyx cleft to middle; perfect stamens 4; capsule ellipsoid, much more than 3.5 mm long ..... *L. nummularifolia*

An annual with a usually erect stem up to 17 cm high, occasionally decumbent and rooting at the lower nodes. Leaves suborbicular, up to 2.5 x 2.1 cm. Flowers solitary, axillary. Calyx lobes linear-lanceolate, ribbed at middle without, the ribs continued down the tube. Corolla pale mauve-brown, with a yellow blotch at base of central lobe of lower lip. Capsule up to 11 x 1 mm.

The capsule is typical. Before dehiscence its wall is semi-transparent showing not only the outline of the seeds but even their sculpturing.

Flowering: Almost throughout the year.

Occurrence: Along bunds of paddy fields and in wet grassy places of the wet lowlands and the wet midlands up to ± 550 m.

Specimens examined: CENTRAL PROVINCE: Kandy District: Peradeniya, Royal Botanic Gardens, Nursery Garden, *Cramer 3400* (US); WESTERN PROVINCE: Kalutara District: Bandaragama, beside Kalutara-Bandaragama Rd., *Cramer 2777* (PDA, US); SOUTHERN PROVINCE: Galle District: Talagaswela, Talgaswela Estate, *Cramer 2848* (PDA, US), Kottawa, by culvert 11/4, Galle-Udugama Rd., *Cramer 3017* (K, PDA, US).

The material of this species *Cramer 3017* has been determined by Mr. D. Philcox of the Kew Herbarium, to whom the author tenders sincere thanks.

Stemodia viscosa Roxb., Pl. Cor. 2 : 33, t. 163, 1802 & Fl. Ind. 3: 94, 1832.

This species may be distinguished from *S. verticillata* (Mill.) Sprague, the only species of *Stemodia* previously recorded for Sri Lanka, as follows:

1. Leaves petiolate; flowers subsessile ..... *S. verticillata*
1. Leaves sessile; flowers distinctly pedicelled ..... *S. viscosa*

The entire plant except the corolla is viscidly and glandular hirsute. In general facies it is a bigger plant than *S. verticillata*, the stem reaching up to 55 cm high and the leaves up to 6.2 x 2.5 cm. The corolla is a dull violet-brown.

The whole plant has a distinctly pleasant aromatic scent.
Flowering: February - March.
Occurrence: In cereal fields and among short grass in the vicinity of ponds in the dry lowlands. The plant seems to prefer a clayey soil.

Specimen examined: NORTHERN PROVINCE: Mannar District: Mannar, along Madawachchiya-Mannar Rd., *Cramer 2805* (L, PDA, US).

Limnophila laxa Benth. in DC., Prodr. 10 : 388, 1846 excl. *Stemodia diffusa* Benth.; Philcox in Kew Bull. 24 (1) : 154, 1970.

This species is included here on the authority of Philcox who has seen a Walker specimen from Ceylon in Kew Herbarium. The author has not encountered the plant nor is there any specimen of it in the Peradeniya Herbarium.

Limnophila rugosa (Roth) Merr., Interpr. Rumph. Herb. Amb. 466, 1917 & Enum. Philipp. Fl. Pl. 3 : 434, 1923.

This species is characterized by its opposite, ovate to ovate-elliptic, petiolate leaves and the enlarged posterior calyx lobe.

Specimens examined: SOUTHERN PROVINCE: Galle District: Hiniduma Pattu, *Livera* 8 Sept. 1924 (PDA) ; CENTRAL PROVINCE: Kandy District: Peradeniya, Royal Botanic Gardens: *Alston 1658* (PDA).

The above specimens are the only ones seen. Livera's specimen has been fully determined by Alston who has written out its label. Alston was not sure, apparently, of the identity of his own specimen and named it only a *Limnophila*. There is no doubt that the two specimens are conspecific. It seems strange that Alston failed to document this new record in his Supplement to Trimen's Handbook of the Flora of Ceylon.

Veronica persica Poir. in Lamk., Encycl. 8: 542, 1808 ; Hk. f. in Fl. Brit. Ind. 4: 294, 1885.

This species is allied to *V. serpyllifolia* L. but is separated from it as follows:

1. Flowers in terminal racemes; pedicels much shorter than 10 mm; leaves shallowly crenate ..... *V. serpyllifolia*
1. Flowers axillary, solitary; pedicels at least 10 mm long; leaves crenate-serrate ..... *V. persica*

Annual. Stem prostrate, pilose. Leaves broadly ovate, up to 17 x 15mm, 5-nerved at base, the nerves fairly prominent beneath. Corolla purplish-blue. Capsule broadly orbicular, up to 6 x 7.5 mm.

Flowering: March - August.

Occurrence: In cultivated fields of the wet uplands above 2000 m.

Specimens examined: CENTRAL PROVINCE: Nuwara Eliya District, Horton Plains, New Farm, *Cramer 2948* (L, PDA, US), Nuwara Eliya, close to marker 155, Hakgala Rd., *Cramer 2957* (US).

The author is greatly indebted to Mr. F. Adema of the Rijksherbarium, Netherlands, for the determination of his material (*Cramer 2948*).

Veronica arvensis L., Sp. Pl. 13, 1753 ; Hk. f. in Fl. Brit. Ind. 4 : 296, 1885.

Annual. Stem erect, up to 35 cm high. Lower leaves broadly ovate, up to 13 x 12 mm. upper or floral ones oblong-lanceolate, up to 8 x 2.5 mm. Corolla bright blue. Capsule broadly obcordate, up to 3.5 x 3.5 mm.

In habit this species is similar to *V. javanica* Bl. but its leafy racemes make it very distinct from the latter.

Flowering: April - August.

Occurrence: In cultivated fields of the wet uplands. It is becoming fairly common in pasture land around Ambawela.

Specimens examined: CENTRAL PROVINCE: Nuwara Eliya District: Mahagastota, close to marker 153, Hakgala Rd., *Cramer 2956* (PDA, US), Horton Plains, beside Ohiya Rd., about 1/8 km. from Farr Inn, *Balakrishnan 471* (PDA, US).

NEW SPECIES

On a field trip to Panichchankeni in the Batticaloa District on the 11th February 1972 the author along with Dr. S. Balasubramaniam of the University of Ceylon, Peradeniya, encountered an usual species of *Lindernia*. After closer examination and study by the former, material of the species was forwarded to the co-author of the species at the Herbarium, Royal Botanic Gardens, Kew, England, who kindly determined the species as new to science. The species has been named to commemorate the new Republic of Sri Lanka.

Lindernia srilankana Cramer & Philcox, sp. nov. Fig. 1.

Haec species *Linderniae hyssopioides* (L.) Haines affinis, sed ab ea caule foliisque hirtulis, marginibus labii corollae superioris distincte serrulatis, staminodiis corniformibus atque capsula ovato-globosa calyce breviore differt.

Herba annua. Caulis erectus, usque ad 7.5 cm altus, prope e basi ramosus, quadrangularis, angulis laeve glanduloso-hirtulus. Folia subsessilia; lamina late ovata ad ovato-oblongam, 0.5-1.4 x 0.4-0.7 cm, basi truncata ad rotundam 5-nervatisque, apice subacuta, marginibus crenato-serrata ciliolataque, utroque punctata, supra glabra, subtus in nervis obviis hirtula. Flores in axillis foliorum inferiorum solitarii, in caulis parte superiore in verticillis 4, pedicellis laeviter deflexi. Bracteae lineari-lanceolatae ad ovato-lanceolatas, 1.75-2.5 mm longae, apice acutae, marginibus ciliolatae. Pedicelli 6-10 mm longi, graciles, hirtuli, in fructu deflexi. Calycis lobi prope usque ad basin fissi, lineari-lanceolati, in fructu extenti. Corolla 8-10 mm longa; tubus 4-5 mm longus, utrinque glabrus, basi subannulatus albineusque, supra rubeo- fuscus; labium superius obspathulatum, 2.5-3 mm longum, apice bifidum, marginibus irregulariter serrulatum, laeviter rubeo-fuscum, lineis adhuc rubeis ornatum; labium inferius usque ad 10 mm trans margines extentum, caeruleum ad subcaeruleum, duobus maculis albis basi lobi medii ornatum Stamina fertilia 2, sub labio corollae superiore inclusa; filamenta brevia, glabra; antherae. conniventes, cum lobis divaricatis; staminodia ad extra curvata, corniformia, caerulea ad subcaerulea, cum crista pilorum caeruleorum minima ab illorum basi de corollae fauce decurrente. Discus cupularis. Stylus glaber; stigma bilamellatum, cum lamellis suborbicularibus. Capsula calyce leviter brevior, septicida, ovato-globosa, 2.4-4 x 1.5 mm, stylo marcido capitata; semina ovato-oblonga, 0.7 mm longa, apice basique truncata, 5-6-sulcata, in sulcis alveolata, pallide fusca.

Typi: SRI LANKA: In regione orientali: in districto Batticaloensi: Panichchankeni, secus viam Valaichchenai-Trincomalee, *Cramer & Balasubramaniam 3629* (holotypus in PDA, isotypi in K, US).

The species is related to *Lindernia hyssopioides* (L.) Haines, but differs from it in having a hirtellous stem and leaves, the corolla upper lip distinctly serrulated at the margins, corniform staminodes, and an ovoid-globose capsule shorter than the calyx.

Annual herb. Stem erect, up to 7.5 cm high, branched from near base, qu drangular, sparsely glandular-hirtellous on angles: Leaves subsessile; lamina broadly oval to oval-elliptic, 0.5-1.4 x 0.4-0.7 cm, truncate to rounded and 5-nerved at base, subacute at apex, crenate-serrate and ciliolate at margins, punctate on both surfaces, glabrous above, sparsely hirtellous on obvious nerves beneath. Flowers solitary in axils of lower leaves, in whorls of 4 in upper part of stem, slightly deflexed on pedicels. Bracts foliaceous, linear-lanceolate to oval-lanceolate, 1.75-2.5 mm long, acute at apex, ciliolate at margins. Pedicels 6-10 mm long, slender, hirtellous, deflexed in fruit. Sepals cleft almost to base, linear- lanceolate, 2.5 x 0.5 mm, subacuminate at apex, sparsely glandular-hirtellous without, spreading in fruit. Corolla 8-10 mm long; tube 4-5 mm long, glabrous on both surfaces, subannulate and whitish at base, dull pinkish-brown

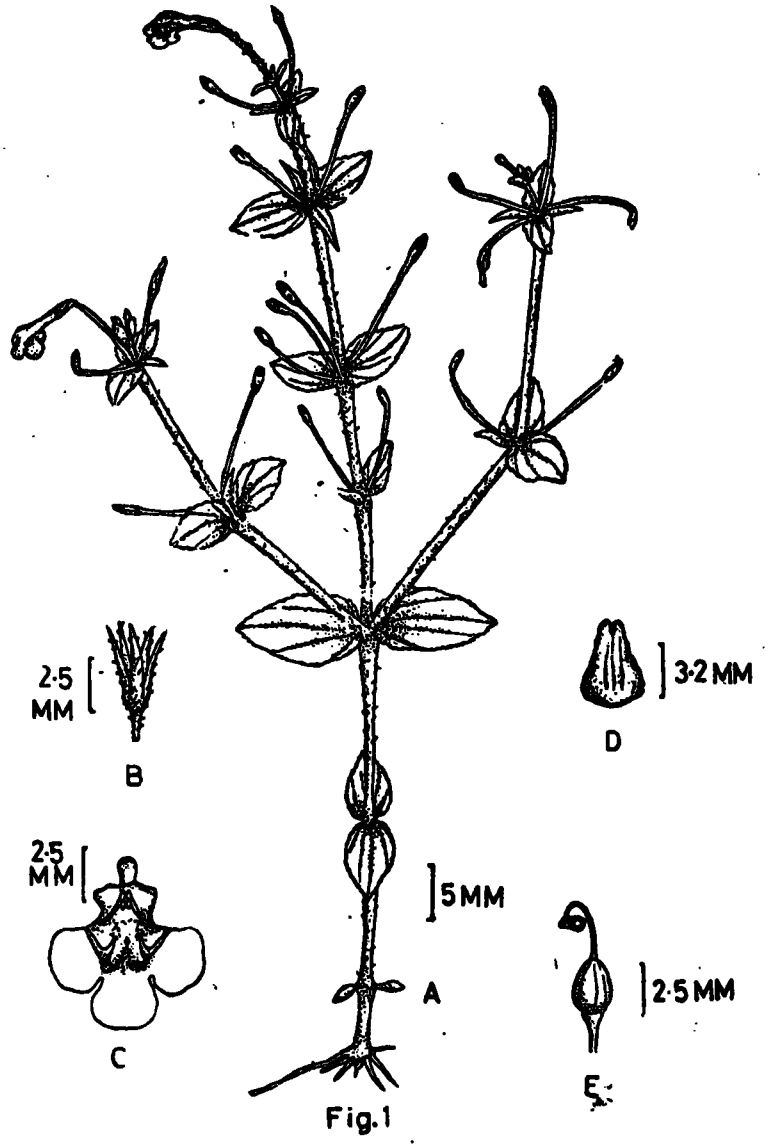

Fig. 1

Fig. 1. *Lindernia srilankana* Cramer & Philcox. A - entire plant. B — flowering calyx. C — corolla without upper lip (dorsal view). D — corolla upper lip. E — capsule with style.

above; upper lip obspathulate, 2.5-3 mm long, 2-fid at apex, irregularly serrulate at margins, dull pinkish-brown, striped darker violet; lower lip spreading up to 10 mm across, prussian blue to pale blue, with 2 white streaks at base of larger, central lobe. Fertile stamens 2, included under corolla upper lip; filaments short, glabrous; anthers connivent, divaricately lobed; staminodes corniform, bent outwards, dark to pale blue, with a minute ridge of dark blue hairs leading from base down corolla throat. Disk cupular. Style glabrous; stigma bilamellate with suborbicular lamellae. Capsule slightly shorter than calyx, septicidal, ovoid-globose, 2.5-4 x 1.5 mm, glabrous, tipped with withered style; seeds ovoid-oblong, 0.7 mm long, truncate at both ends, 5-6-grooved, alveolate along grooves, pale brown.

Types: SRI LANKA: Eastern Province: Batticaloa District: Panichchankeni, along Valaichchenai-Trincomalee Rd., *Cramer & Balasubramaniam 3629* (holotype in PDA, isotypes in K, US).

Distribution: Sri Lanka, in thedry lowlands, eastern and north central provinces, at sea level.

Ecology: The plant grows in grassy localities in damp or wet sandy-loam soil liable to flooding during the rainy season. It grows commonly in association with *Dopatrium junceum* (Roxb.) Buch.- Ham. and *Eriocaulon quinquangulare* L. and less so with *Cyperus pumilus* L

In addition to the type locality the species also occurs at the foot of Gunner's Quoin, Polonnaruwa district, North Central Province (*Cramer 4000* in CAL, PDA, US). Here as well as in the type locality the species is locally common. In subsequent specimens examined the stem of the plant was observed to reach up to 13.5 cm high, and the leaf lamina up to 1.7 x 1.1 cm. The erectness of the stem with the whorls of flowers in its upper part and the shape of the leaves and capsule form good distinguishing features of the plant in the field. The distinct serrulation of the corolla upper lip and the shape of the staminodes are visible only under the lens and lend confirmation to the identity of the species. The deep coloration of the corolla lower lip quickly fades with age. In full bloom this little plant affords a pretty sight!

EXCLUDED SPECIES

Glossostigma spathulatum (Hook.) Arnott ex Benth. in Comp. Bot. Mag. 2: 59, 1836; Hook. f. in Fl. Brit. Ind. 4 : 288, 1885; Trim., Handb. Fl. Ceyl. 3: 255, 1895.

Trimen has referred to the possible occurrence of this species in Sri Lanka. Though his reference was influenced by Hooker's citation of a Gardner specimen from Ceylon, Trimen states all the same: "I have seen no specimens." In the absence of Ceylonese material of this species and consequent on fairly exhaustive field study of the entire family the author feels reasonably justified in excluding the occurrence of this species in the country.

Buchnera hispida Buch.-Ham. in D. Don, Prodr. Fl. Nep. 91, 1825: Thw., Enum. Pl. Zeyl. 220, 1860; Trim., loc. cit., 257.

Thwaites' citation has been called in question by Trimen who states that this "appears to have been an error." For the same reasons mentioned in regard to the previous species the author corroborates Trimen's statement.

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