

IDENTIFICATION OF SEEDS OF INDIAN SENNA OF COMMERCE

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ABSTRACT

Seeds of 8 species of the Sub-genus *Senna* under the genus *Cassia* L. of the family Caesalpiniaceae viz. *C. angustifolia* Vahl, *C. sophora* L., *C. occidentalis* L., *C. siamea* L., *C. obovata* Collad., *C. obtusifolia* L., *C. tora* L. and *C. auriculata* L. have been studied. Seeds of 7 species have medicinal value but one species—*C. obovata* has been reported to be mixed with the seeds of *C. angustifolia*, the Tinnevely Senna. A key to the species on the basis of seed structure has been provided for easy identification. Local names in major Indian languages have also been given.

The Sub-genus *Senna* of the genus *Cassia* L. of the family Caesalpiniaceae includes 34 species distributed in the tropics (De Wit, 1956). 10 species occur in India 7 being indigenous and 3 introduced. Out of the 10 species seeds of 7 have medicinal value and are used in commerce while seeds of *C. obovata* have not much use in medicine of its own and are reported to be mixed purposely with that of *C. angustifolia*, the Tinnevely Senna (Sastri *et al.* 1950). It has also been noticed that often seeds sent by traders for identification are under wrong names. It was considered useful to make a detailed study of seeds of *Senna*.

For this study samples of seeds were used from the Gallery exhibits and Economic herbarium of the Industrial Section and Central National Herbarium. Seeds of some of the species were also collected by the authors from the fields and from the Crude Drug dealers of Calcutta.

A comparative study showed that all *Senna* seeds examined developed from anatropous ovules. Excepting *C. angustifolia* seeds of all other species have surfaces with areolae. Seed-coat differentiated into testa and tegmen. Seeds are copiously endospermous except in *C. angustifolia* where it is

thin and scaly. All seeds have micropyle above the hilum.

This study has also showed that there are differences in some characters of the structure of all the seeds. Taking all those differences a key has been provided for the purpose of easy identification.

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|--|-----|------------------------|
| 1a. Seed-surfaces without areolae | ... | 1. <i>angustifolia</i> |
| 1b. Seed-surfaces with areolae : | | |
| 2a. Cotyledons flat : | | |
| 3a. Seeds concave | ... | 2. <i>sophora</i> |
| 3b. Seeds flat : | | |
| 4a. Seed-coats reticulately wrinkled; cotyledons veined | ... | 3. <i>obovata</i> |
| 4b. Seed-coats lacking reticulate wrinkles, smooth or minutely pitted; cotyledons without veins: | | |
| 5a. Seeds round | ... | 4. <i>occidentalis</i> |
| 5b. Seeds oblong | ... | 5. <i>siamea</i> |
| 2b. Cotyledons wavy : | | |
| 6a. Seeds rhomboid; cotyledons deeply wavy : | | |
| 7a. Areolae linear, parallel to the margins | ... | 6. <i>obtusifolia</i> |
| 7b. Areolae rhomboid, stretching to the margins | ... | 7. <i>tora</i> |
| 6b. Seeds rectangular; cotyledons irregularly, shallowly wavy... | | 8. <i>auriculata</i> |

Cassia angustifolia Vahl, Symb. Bot. 1: 29. 1804; Baker in Hook. f. Fl. Brit. India 2: 264. 1878; Sastri *et al.* Wealth of India (Raw Mat.) 2: 93. 1950.

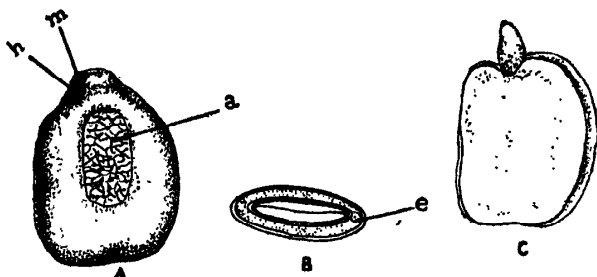
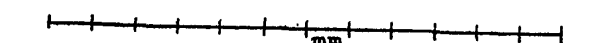
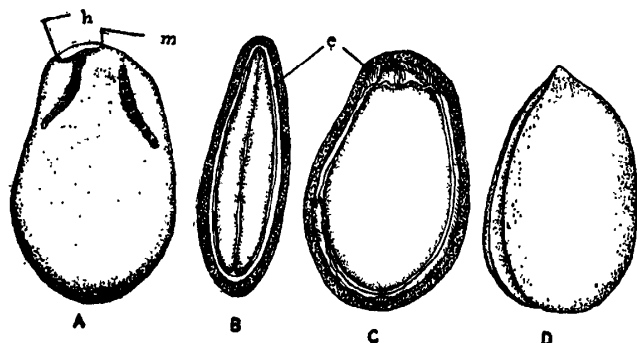
Local names: Tinnevely Senna (Tam. & Eng.); Hindisana (Hind.).

Seeds yellowish-brown, $\pm 5 \times 4$ mm, slightly obovate with two narrow slightly curved

marks towards the hilar end. Areola absent. Seed-coat very hard even after soaking in water. Endosperm thin, scaly. Cotyledons $\pm 4 \times 3$ mm, thick, obovate, narrowed to short radicle.

Cultivated in South India.

Pods used as laxative and purgative. [Fig. 1 (A-D)]



Top : Fig. 1 (A-D) : A. A seed. B. T. S. of seed. C. L. S. of seed. D. Cotyledons with radicle. e—endosperm. m—micropyle. h—hilum.

Bottom : Fig. 2 (A-C) : A. A seed. B. T. S. of seed. C. Cotyledons with radicle. a—arcola. e—endosperm. m—micropyle. h—hilum.

C. sophora L. Sp. Pl. 379. 1753; Baker in Hook. f. Fl. Brit. India 2: 262. 1878; Sastri *et al.* Wealth of India (Raw Mat.) 2: 99. 1950.

Local names: Kasunda (Hind.); Kalkasunda (Beng.); Sularai (Tam.); Kandakashida (Tel.); Pountakarai (Mal.) and Kasodi (Marath.).

Seeds dull olive colour, $3.5-4 \times 3-3.5$ mm, ovoid, narrow at the hilar ends, concave. Areola present. Cotyledons $\pm 3 \times 3$ mm, rectangular. Radicle 1 mm long, slightly bent on one side.

Occur throughout India.

Used in skin diseases. [Fig. 2 (A-C)]

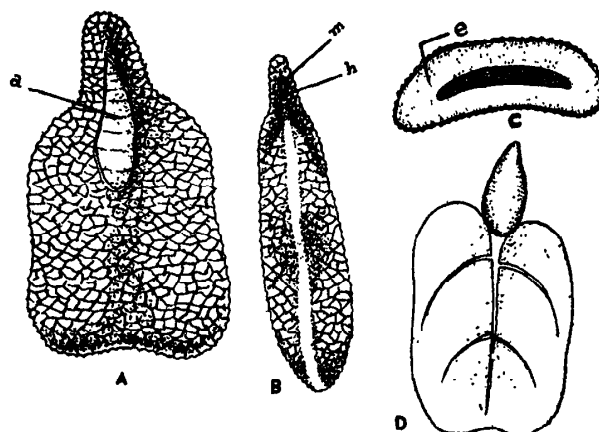
C. obovata Collad. Hist. Cass. 92, t. 15. 1816; Baker in Hook. f. Fl. Brit. India 2: 264. 1878; Sastri *et al.* Wealth of India (Raw Mat.) 2: 96. 1950.

Local names: Chottataroda (Hind.); Bhuitarwar (Marath.); Sarati, Sonamukhi (Guj.); Seruvanni (Mal.); Kattulavira (Tam.) and Sonamukhi (Tel.).

Seeds yellowish-brown, $6-8 \times 4-6$ mm, rectangular, with 2 mm long enlarged neck on the hilar end and little depressed on the opposite end; surface wrinkled with narrow areola towards the hilar end. Cotyledons $5-6 \times 4-5$ mm, rectangular, thick, yellow, veins raised. Radicle 1 mm long.

Occur in Gujarat, Punjab and Maharashtra.

Seeds are reported to be mixed with that of *C. angustifolia* (Sastri *et al.* 1950). [Fig. 3 (A-D)]



Top: Fig. 3 (A-D) : A. A seed. B. Side view of a seed. C. T. S. of seed. D. Cotyledons with radicle. a—arcola. e—endosperm. m—micropyle. h—hilum.

Bottom : Fig. 4 (A-C) : A. A seed. B. T. S. of seed. C. Cotyledons with radicle. a—arcola. e—endosperm. m—micropyle. h—hilum.

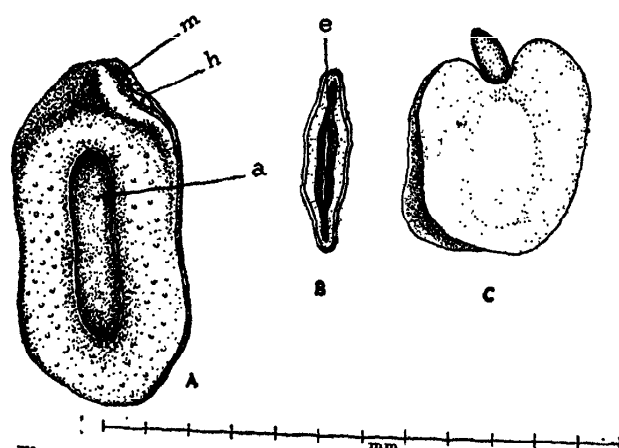
C. occidentalis L. Sp. Pl. 377. 1753; Baker in Hook. f. Fl. Brit. India 2: 262. 1878; Sastri *et al.* Wealth of India (Raw Mat.) 2: 96. 1950.

Local names: Kasondi (Hind.); Kalkasunda (Beng.); Nattam-takarai (Tam.); Kasunda (Tel.) and Nittam-takara (Mal.)

Seeds brownish-green, 4-5 mm in diam., orbicular, thickened at the hilar end and areola present. Cotyledons \pm 4 mm in diam. Radicle up to 1 mm long and straight.

Occur throughout India; probably introduced (Baker, 1878).

Seeds are used as purgative, also externally applied in skin diseases. [Fig. 4 (A-C)]



Top: Fig. 5 (A-C): A. A seed. B. T. S. of seed. C. Cotyledons with radicle. a—*areola*. e—*endosperm*. m—*micropyle*. h—*hilum*.

Bottom: Fig. 6 (A-C): A. A seed. B. T. S. of seed. C. Cotyledons with radicle. a—*areola*. e—*endosperm*. m—*micropyle*. h—*hilum*.

C. siamea Lamk. Encycl. 1: 648. 1785; Baker in Hook. f. Fl. Brit. India 2: 264. 1878; Sastri *et al.* 2: 98. 1950.

Local names: Sima, tangedu (Tel. & Kand.); Kassod (Marath.) and Manji-Konne (Tam.).

Seeds brown, 6-8 \times 4-5 mm, oblong with slightly narrower at the hilar end. Areola light brown in the middle, surrounded by the pits. Cotyledons \pm 4 \times 4 mm. Radicle 1 mm long, little bent on one side.

Occur in South India.

Pods contain toxic alkaloid which is fatal to pigs. [Fig. 5 (A-C)]

C. obtusifolia L. Sp. Pl. 377. 1753. *C. tora* Baker in Hook. f. Fl. Brit. India 2: 263. 1878 (pro parte non L.).

Local names: Chakunda (Beng. & Hind.); Tagarai (Tam.); Tantamu (Tel.) and Takla (Marath.).

Seeds glossy dark brown, 5-7 \times 3-4 mm, rhomboid with slight projection at the hilar end. Areola present, linear, parallel to margin. Cotyledons deeply wavy. Radicle 1 mm long, involute.

Occur throughout India.

Used externally in skin diseases, ringworm and itchings. [Fig. 6 (A-C)]

C. tora L. Sp. Pl. 376. 1753; Baker in Hook. f. Fl. Brit. India 2: 263. 1878;

Sastri *et al.* Wealth of India (Raw Mat.) 2: 98. 1950.

Local names: Chakunda (Beng. & Hind.); Tagarai (Tam.); Tantamu (Tel.) and Takla (Marath.).

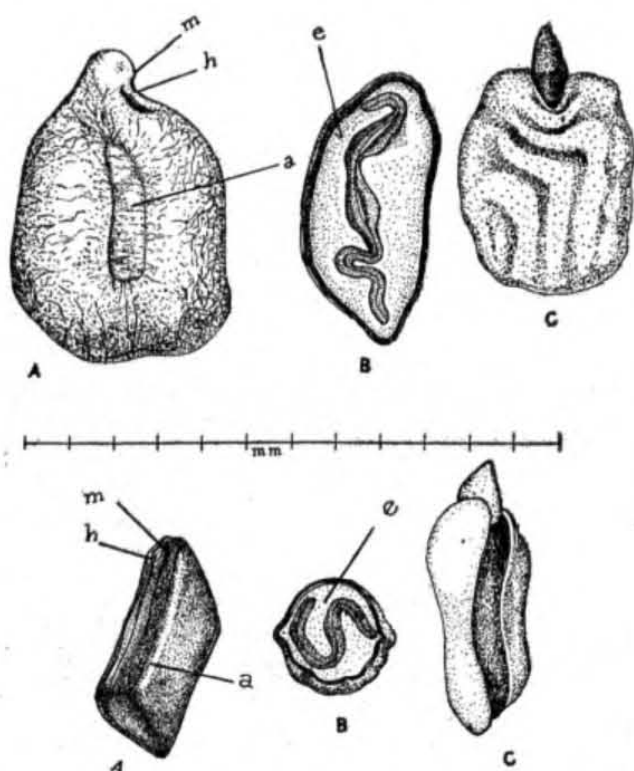
Seeds greenish-brown with glossy brown margins, \pm 5 \times 3 mm, more or less rhomboid, slightly projected at the hilar end. Areola extending to the margins. Cotyledons deeply wavy. Radicle 1 mm long, involute.

Occur throughout India.

Used in skin diseases, ringworm and itchings. [Fig. 7 (A-C)]

C. auriculata L. Sp. Pl. 379. 1753; Baker in Hook. f. Fl. Brit. India 2: 263. 1878; Sastri *et al.* Wealth of India (Raw Mat.) 2: 96. 1950.

Local names: Tarwar (Hind.); Avaram



Top: Fig. 7 (A-C) : A. A seed. B. T. S. of seed. C. Cotyledons with radicle. a—*areola*. e—*endosperm*. m—*micropyle*. h—*hilum*.

Bottom: Fig. 8 (A-C) : A. A seed. B. T. S. of seed. C. Cotyledons with radicle. a—*areola*. e—*endosperm*. m—*micropyle*. h—*hilum*.

(Tam.); Tangedu (Tel.), Avara (Mal.) and Tarwad (Marath.).

Seeds blackish-brown, 7.9×5.7 mm, oblong, being suddenly narrowed at the hilar end. Areola at the centre of the surface. Cotyledons 5.6×3.4 mm, rectangular, irregularly and longitudinally wavy. Radicle 1 mm long.

Occur in the dry regions of Madhya Pradesh, Maharashtra and South India.

Used in ophthalmia, conjunctivitis and diabetes. [Fig. 8 (A-C)]

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