

Physalis cordata (Solanaceae): a new record for India

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Abstract: *Physalis cordata* Houst. ex Mill. (Solanaceae), a native of North and South America has been collected from North 24-Parganas district of West Bengal, India in 2024 is reported here as an addition to the Flora of India. Morphological description, location map and a photo plate are provided here for its proper recognition.

Keywords: *Physalis*, North 24-Parganas district, West Bengal, Invasive species, Native of Americas.

Introduction

The genus *Physalis* L. (Solanaceae) comprises of 90 to 94 species (Mabberley, 2017; Martinez *et al.*, 2023; POWO, 2026), mostly in Americas, a few in Asia and Europe, about 46 species are native to Mexico (Vargas-Ponce & Martinez, 2001). Some of its cultivated and weedy species have been introduced or migrated worldwide. A defining feature of the genus *Physalis* is a large, papery husk produced by the enlargement of calyx, which partly or fully encloses the fruit (Whitson & Manos, 2005). Clarke (1883) recorded two species *viz.* *P. minima* L. and *P. peruviana* L. for the then British India but recently Meena *et al.* (2020) recorded six species from India. Chowdhury *et al.* (2024) also recorded one more species, *P. pubescens* L. from India. In West Bengal, the genus is represented by four species, *viz.* *Physalis angulata* L., *P. divaricata* D.Don, *P. minima* and *P. peruviana* (Pramanik, 2019).

During a recent floristic survey in the North 24-Parganas district of West Bengal, India, some

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scattered individuals of an interesting species of *Physalis* has been collected from different localities. On critical morphological study along with the help of protologue, and digital image of type specimen and description by Martinez *et al.* (2023), the plant has been identified as *Physalis cordata* Houst. ex Mill.

The identity of the species was later confirmed by Pilar Zamora-Tavares, co-author of the *Taxonomic revision of Physalis in Mexico* (Martinez *et al.*, 2023), in a personal communication dated 14.01.2025. The species can be identified by having its corolla rotate-campanulate, light yellow, evidently maculated and fruiting calyx strongly 5-angled. It is allied to *P. pubescens* L. and *P. angulata* but differs from *P. pubescens* by having terete stem, ovate lamina, calyx lobes become linear-lanceolate after anthesis, fruiting calyx glabrous and 5-costate. *P. angulata* also differs from *P. cordata* by having stems generally angled and grooved, lamina elliptic to elliptic-ovate, calyx lobes become deltoid after anthesis and fruiting calyx 10-costate (Table 1).

Materials and Methods

This species was collected from Gustia and Bamunmura areas of North 24 Parganas district of West Bengal. The herbarium specimens were prepared following Jain and Rao (1977) and Das (2021) and deposited at Central National Herbarium (CAL). The plant material was studied using a Dewinter Gemstar Stereomaster Binocular Stereo Zoom Microscopes. The flowers were dissected and illustrated. Field photographs of the plant and

its diagnostic characters were taken using a Nikon D7500 digital camera fitted with a Nikon AFS DX NIKKOR 18–140 mm f/3.5–5.6G ED VR lens. Images were captured under natural light in the field, focusing on habit, leaves, flowers, and fruits to document important morphological characters. The photographs were later examined and selected for illustration of diagnostic features in the present study.

Taxonomic Treatment

Physalis cordata Houst. ex Mill., Gard. Dict., ed. 8. no. 14. 1768; Martinez *et al.*, Front. Genet. 15. 2023. *Lectotype* (designated by Pretz & Deanna, 2020): MEXICO, Veracruz, 1730, *W.Houston s.n.* (BM [BM000775367] digital image!). **Figs. 1 & 2**

Annual erect herbs, up to 1 m tall, sparsely pubescent with simple hairs or glabrous, sparingly branched. Stem almost terete, with one ridge extending up to leaf-base, green to pale-brown. Leaves simple, alternate, exstipulate; petioles 1.5–6 cm long, terete, pubescent; lamina ovate, 3–10 × 2.5–6 cm, shortly caudate-acuminate, serrate to dentato-serrate, base oblique, rounded to slightly cordate, sparsely pubescent along veins, lateral veins 4–5 on each side, alternate, unevenly distributed, each tooth of lamina receiving a vein-terminus, vein-reticulation prominent below. Flowers axillary to solitary; pedicels 0.6–0.8 cm long, elongated in fruits to 1.2 cm, terete, slender, sparsely pubescent. Calyx tubular campanulate; tube 0.3–0.5 cm long, lobes 5, triangular-subulate, 0.5–0.6 cm long, reflexed, green to brown, pubescent, mid-vein prominent, sparsely hairy, linear lanceolate after anthesis. Corolla rotate campanulate; light yellow with light lemon-yellow maculation near the base, base also with small cordate or circular depression inside and elevated outside, throat pubescent; limb rotate, lobes 5, short, broadly triangular, 0.4–0.8 cm long, apex acute to obtuse, mid-vein prominent. Stamens unequal; filaments 0.4–0.5 cm long, attached near or at the base of corolla, erect, terete, with very few unicellular hairs; anthers narrowly oblong, yellowish white, 0.2–0.35 cm

long, basifixed, dehisce longitudinally. Ovary ovoid, 0.1–0.2 cm long, obscurely 4-lobed; style terminal, terete, glabrous; stigma small, capitate. Berries ovoid, 1–1.5 × 0.7–0.9 cm, glabrous, shiny, green, turn yellowish on ripening; fruiting calyx much enlarged, enclosing the berry, turbinate, invaginated at base, strongly 5-costate, 2.5–4.0 × 2–2.5 cm, mid-veins not strong, glabrous, green. Seeds numerous, elliptic-discoid, yellowish-brown, 0.15–0.2 × 0.1–0.12 cm.

Flowering & Fruiting: December to April.

Distribution: India (West Bengal); China (Hainan); native of North and South America.

Habitat: Growing along the road sides, fallow land, prefers moist and partially shaded places.

Specimen examined: INDIA, **West Bengal**, North 24-parganas district, Gustia, 26.02.2024, *S. Chowdhury SC10* (CAL); North 24-parganas, Bamunmura, 28.03.2024, *S. Chowdhury SC15* (CAL).

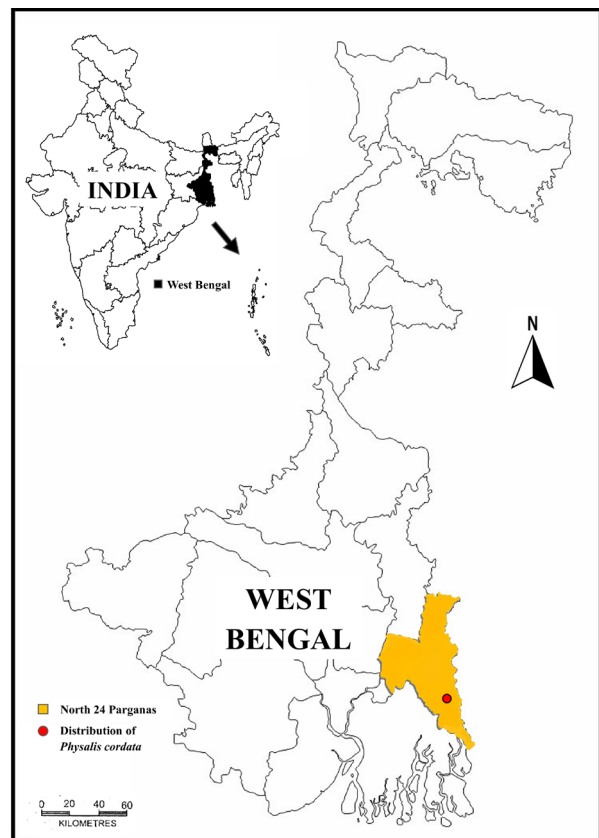


Fig. 1. Distribution map of *Physalis cordata* Houst. ex Mill. in India.

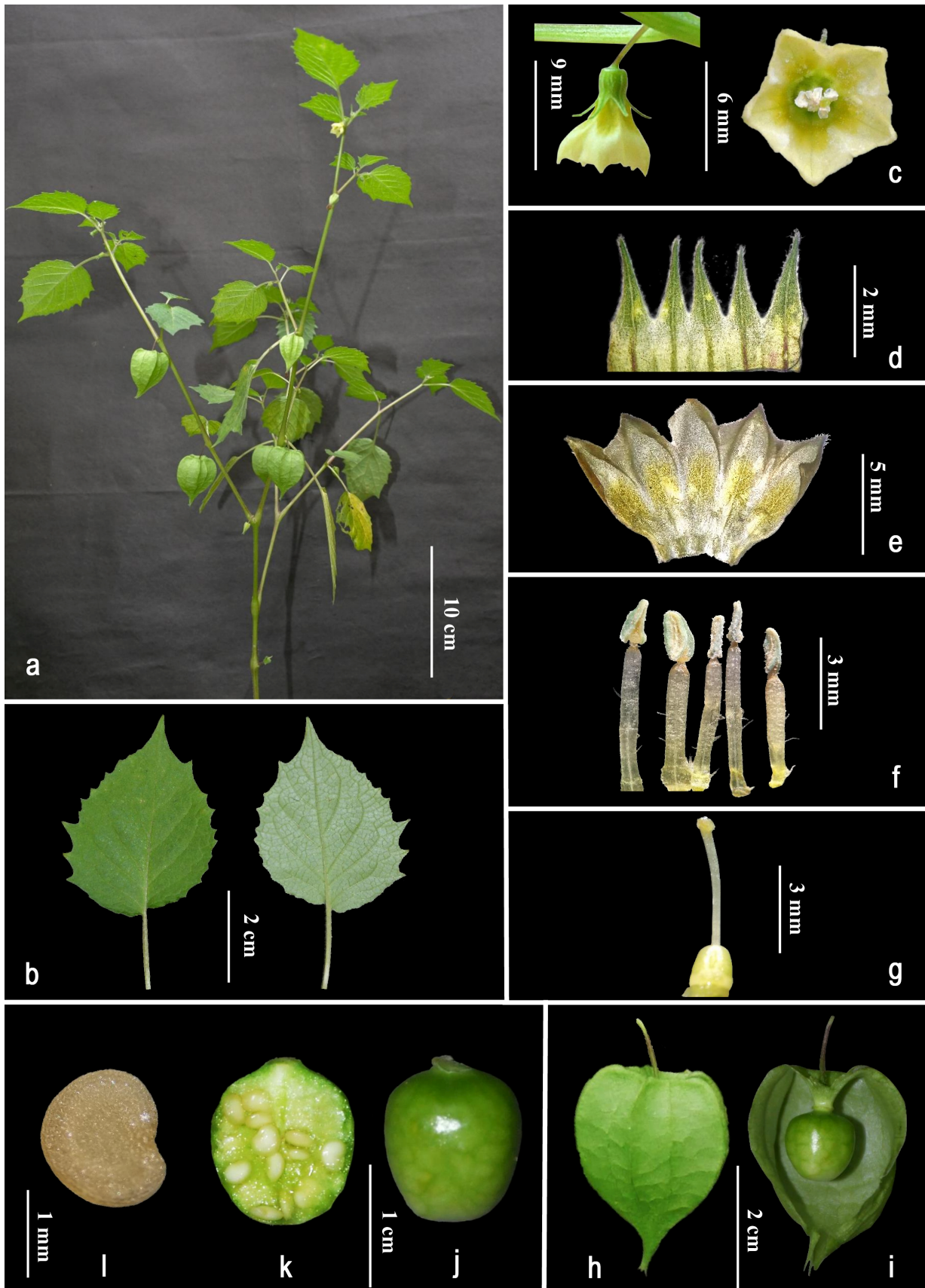


Fig.2. *Physalis cordata* Houst. ex Mill. **a.** Flowering twig; **b.** Leaves; **c.** Flower; **d.** Calyx; **e.** Corolla and its top view; **f.** Anthers; **g.** Gynoecium; **h.** Fruit enclosed within calyx; **i.** Fruit in open calyx; **j.** Fruit; **k.** Vertical section of fruit; **l.** Seed.

Table 1. Taxonomic differences among *P. cordata*, *P. angulata* and *P. pubescens*.

Characters	<i>Physalis cordata</i> Houst. ex Mill.	<i>Physalis angulata</i> L.	<i>Physalis pubescens</i> L.
Stem	Terete, sparsely pubescent with simple eglandular hairs or glabrous	Generally angled and grooved, mostly glabrous with few simple eglandular hairs	Generally terete but sometimes angled, pubescent with glandular multicellular hairs
Leaf lamina	Ovate; base oblique, rounded to slightly cordate; sparsely pubescent along veins beneath; margins serrate to dentato-serrate	Elliptic to elliptic-ovate; base attenuate; pubescent; margins entire or sometimes dentate (2–7 teeth per side)	Ovate; base oblique, rounded; glandular-pubescent on both surfaces; margins irregularly dentate, rarely entire
Calyx lobes	Linear-lanceolate	Deltoid	Lanceolate
Corolla	Light yellow with 5 light lemon-yellow maculations	White with 5 diffused brown maculations	Pale yellow with 5 dark purple-brown maculations
Fruiting calyx	Turbinate, basally invaginated, strongly 5-costate, glabrous	Ovoid, 10-costate, often minutely puberulent	Oblong-ovate, strongly 5-costate, pubescent
Berry	Ovoid, light green to greenish yellow at maturity	Spherical, light green to pale yellow at maturity	Ovoid-subglobose, pale yellow to yellow at maturity
Seed	Elliptic-discoïd, yellowish-brown	Subglobose, pale brown	Subglobose, light yellow

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