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Talinum fruticosum (Talinaceae: Caryophyllales): An addition to the state flora of West Bengal, India

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ABSTRACT

The present paper deals with *Talinum fruticosum* (L.) Juss., an introduced species, collected from the Ballavpur Wildlife Sanctuary, Birbhum District, West Bengal which marks its first extended distribution, an addition to the state flora. The detailed morphological taxonomic description, field photographs, identification key and relevant taxonomic notes are provided herewith for an easy identification.

Keywords: Ballavpur Wildlife Sanctuary, Birbhum, New record, Succulent plant, *Talinum*

1. INTRODUCTION

Talinaceae (Fenzl) Doweld is a small angiosperm family under the order Caryophyllales and consists of two genera, *Amphipetalum* Bacig. and *Talinum* Adans. The former is a monotypic genus represented by *A. paraguayense* Bacig., native to Bolivia and Paraguay. In contrast, the latter consists of 28 species with a distribution centred mainly in tropical and subtropical regions worldwide (POWO, 2026). In India, the family Talinaceae is represented by a single genus, *Talinum*, with three species, viz., *Talinum fruticosum* (L.) Juss., *T. paniculatum* (Jacq.) Gaertn. and *T. portulacifolium* (Forssk.) Asch. Ex Schweinf. (Rao, 1993; Pramanick et al., 2020; Kaini et al., 2026) of which *T. portulacifolium* has been reported in West Bengal (Prain, 1903; Santhosha and Kar, 2017).

Talinaceae was traditionally treated within the broadly circumscribed family Portulacaceae *s.l.* However, based on the molecular phylogenetic studies, four distinct lineages viz., Anacampserotaceae, Montiaceae, Portulacaceae *s.s.*, and Talinaceae were identified and recognized as separate families (Carolin, 1993; Hershkovitz and Zimmer, 1997; Applequist and Wallace, 2001; Eggli and Ford-Werntz, 2002; Nyffeler, 2007; Nyffeler and Eggli, 2010; APG IV, 2016). The members under the family Talinaceae have been documented as an invasive plants and unconventional sources of food and medicine (Mendoza and Wood, 2013; Madeira and Botrel, 2018; Souza and Lorenzi, 2019; Menezes, 2020; Hassemer, 2022).

During the botanical exploration in the dry deciduous forest of Ballavpur Wildlife Sanctuary, Birbhum District, West Bengal, a few specimens belonging to family Talinaceae were collected. A detailed examination of the specimens with relevant taxonomic literature (Prain, 1903; Rao, 1993; Dam and Malick, 1997; Pramanick et al., 2020; Bennet, 1979; Guha Bakshi, 1984; Sanyal, 1994; Debnath et al.,

2013; Mitra and Mukherjee, 2013; Ghosh and Mallick, 2014; Santhosha and Kar, 2017) revealed the identity as *Talinum fruticosum* (L.) Juss. The detailed morphological description and photographs of the species collected is presented in the paper.



Figure 1. Location map of *Talinum fruticosum* (L.) Juss. (Red dot).

2. MATERIALS AND METHODS

A floristic survey was carried out in Ballavpur Wildlife Sanctuary, Birbhum District, West Bengal, during the monsoon season - 2026 to document its floristic composition (Figure 1). In the field an interesting succulent species of *Talinum* Adans. was encountered and collected for further detail study. The collected specimens were carefully examined, and processed using standard herbarium techniques (Fosberg and Sachet, 1965; Jain and Rao, 1977; Bridson and Forman, 1998). Identification and authentication were carried out with the help of relevant taxonomic literature (Rao, 1993; Kaini et al., 2026), and the accepted nomenclature was verified from POWO (2026). The specimens were subsequently poisoned, dried, mounted, and deposited in the Botany Department of Visva-Bharati (A Central University), Santiniketan for future reference.

3. RESULTS & DISCUSSION

Taxonomic Treatment

Talinum fruticosum (L.) Juss., Gen. Pl. Paris: 312. 1789. *Talinum triangulare* (Jacq.) Willd., Sp. Pl. 2: 862. 1799; Rao in Sharma & Sanjappa (eds.) Fl. India 3: 10. 1993; Balakrishnan in Daniel (ed.) Fl. Kerala 1: 320. 2005. Pramanick & al., in Mao & Dash (eds.) Fl. Pl. India 1: 144. 2020. *Portulaca triangularis* Jacq., Enum. Syst. Pl.: 22. 1760. *Portulaca racemosa* L., Mant. Pl.: 242. 1771 (Figures 1 to 3).



Figure 2. *Talinum fruticosum* (L.) Juss.: General features (a–k): a) Habit; b) Leaves; c) Triangular inflorescence axis; d) Flower; e) Two sepals; f) Five petals; g) Stamens; i) Gynoecium j) Fruit capsule; k) Seeds. (Photographs by Shamim Alam).

Perennial herbs or subshrubs, up to 70 cm tall; stems terete, glabrous, fleshy, reddish towards the base, greenish towards the apex. Leaves simple, alternate, petiolate, oblanceolate to narrowly obovate, 8.5–15.5 × 2.7–4.3 cm, succulent, glabrous, green; lamina entire, slightly thickened; apex obtuse to rounded, retuse; base attenuate, gradually tapering into a short petiole of 3–4 mm long; midrib prominent on the lower surface and distinct above; secondary veins numerous, fine and weakly prominent. Bracts or bracteoles reduced, 0.2–0.3 cm long, subulate. Inflorescence a terminal and axillary branched-cymes on distinctively triangular stalks; peduncle 1.5–3.5 cm long; Flowers bisexual, actinomorphic, pedicellate, pink to purplish-pink, open during the day from 9 AM to 1 PM; pedicel slender, 0.8–1.1 cm long, green, articulated. Sepals 2, polysepalous, unequal, ovate-lanceolate, 0.5–0.6 × 0.2–0.3 cm, membranous, glabrous, acuminate, 3-veined, persistent after fruit development. Petals 5, polypetalous, obovate to broadly obovate, 0.65–0.75 × 0.5–0.55 cm, pink to purplish-pink, delicate, glabrous; apex rounded to slightly emarginate; base attenuate. Stamens numerous, free, 22–26 in number, inserted around the ovary; filaments slender, filiform, 0.3–0.35 cm long, pinkish to purplish; anthers yellow, small, bilobed, longitudinally dehiscent. Ovary superior, globose to ovoid, 0.2 cm in diameter, green, 3-carpellary, syncarpous, unilocular, glabrous, smooth; style filiform, slender, 0.4–0.5 cm long, arising from the apex of the ovary and dividing apically into 3 branches; stigma trifid with slender, spreading lobes, 0.2–0.25 cm long, dark purple, extending beyond the stamens. Fruit a capsule, sub-globose to ovoid, 0.5–0.6 × 0.4–0.5 cm, shortly stipitate, greenish-yellow with reddish-brown spots. Seeds small, black to dark brownish-black, 40–45 in numbers per capsule, reniform to lenticular, 0.1–0.15 × 0.1 cm, glossy; testa tuberculate; hilum distinct.

Flowering & Fruiting:
Flowering late May–September; fruiting June–September.

Habitat & Ecology:
Several numbers of *Talinum fruticosum* (L.) Juss., were located and found at the western boundary of Ballavpur Wildlife Sanctuary, Birbhum district, West Bengal, at an elevation of approximately 68–73 m, in the dry deciduous forest vegetation, along with other angiosperm species such as *Ziziphus mauritiana* Lam., *Commelina benghalensis* L., *Cryptolepis buchananii* R.Br. ex Roem. & Schult., *Pterocarpus marsupium* Roxb., and *Ipomoea cairica* (L.) Sweet.

Distribution in India:
Assam, Karnataka, Kerala, Manipur, Tamil Nadu and West Bengal (present report).

Specimen examined:
India: West Bengal, Birbhum district, Ballavpur Wildlife Sanctuary, 23°40.471′ N, 87°39.426′ E, 68 m a.s.l., 4th August 2026; S. Alam 667.

Taxonomic & other notes:
The traditional two non-essential floral structures, viz. sepals and petals in *Talinum*, and broadly in the family Portulacaceae *s.l.*, are not homologous with the true sepals and petals, respectively, as found in other plants. However, the former was variously named by different taxonomists as ‘sepals’ (Geesink, 1969; Cronquist, 1981; Carolin, 1993); ‘sepaloid bracts’ (Legrand, 1949); ‘pseudosepals’ (Legrand, 1953); ‘bracteoles’ (Zomlefer, 1995; Judd et al., 2007). Besides, Pax and Hoffmann (1934) recognized the ‘sepals’ in *Talinum* / Portulacaceae *s.l.* as “involucral bracts”, whereas the ‘petals’ in the family were considered the elements of the perigone. The lack of true petals in Portulacaceae *s.l.* was first reported by Payer (1857) and later received wider acceptance (Friedrich, 1956; Eckardt, 1976; Nyffeler and Eggli, 2010). According to Erbar and Leins (2006), the absence of the true petals and the presence of perigonal elements are characteristic features of the higher Caryophyllales.

Talinum fruticosum is closely allied with the species *T. portulacifolium*; however, it can be distinguished by its flower arrangement in cymes borne on a distinctly triangular peduncle (Figure 2c) (vs. paniculate inflorescence with a terete peduncle in *T. portulacifolium*); prominent, membranous, 3-veined sepaloid structures (Figure 2e) (vs. succulent structures with obscure venation); and tuberculated seeds (vs. smooth seeds). *Talinum fruticosum* is a succulent plant species and exhibits facultative Crassulacean Acid Metabolism (CAM) as an adaptation to environmental stress. Under non-stress conditions, C_3 photosynthesis predominates, whereas CAM becomes active under drought and other environmental stresses, thereby contributing to improved water-use efficiency (Winter and Holtum 2014; Wai et al., 2019; Brilhaus et al., 2023).

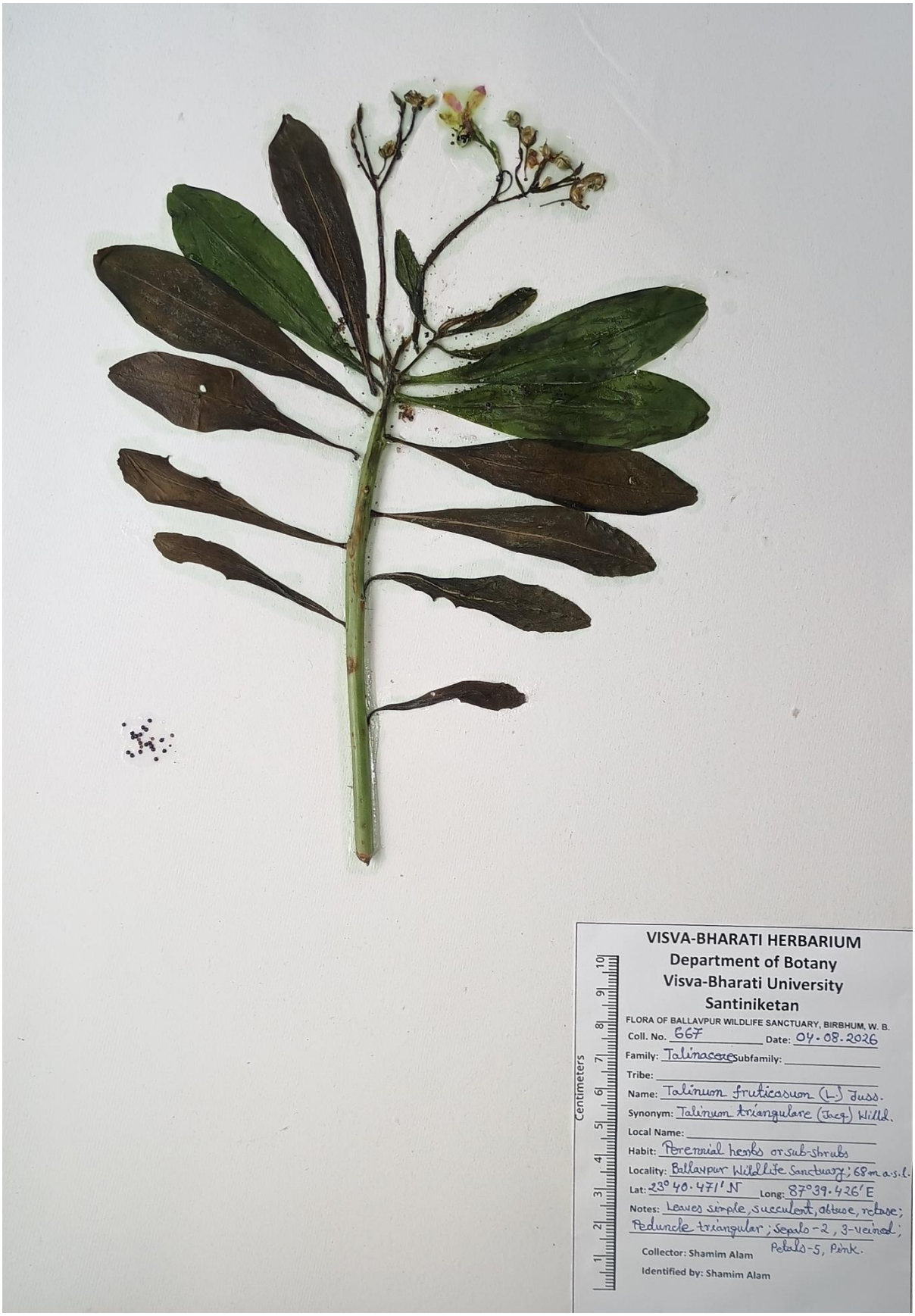


Figure 3. Herbarium sheet of *Talinum fruticosum* (L.) Juss.

Talinum fruticosum is an underutilized, unconventional food plant (UFP) originating in tropical Africa (Barman et al., 2024), widely distributed across forest ecosystems and cultivated fields as ground vegetation or a weed (Manikandan et. al., 2023). The leaves are a nutritionally valuable food source, providing appreciable amounts of protein, calcium, iron, zinc, and molybdenum (Manhaes et al., 2008; Almerol et al., 2026), a rich source of valuable natural functional polymers, including mucilage and pectin (Akin-Ajani et al., 2022). They are eaten as vegetables as salads and cooked forms like stews, soups, and omelettes (Kinupp, 2007; Madeira and Botrel, 2018). It is used as a substitute for spinach in northern Brazil (Oliveira et al., 2013) and is consumed as a leafy vegetable in Nigeria & Cameroon (Manikandan et al., 2023), and NorthEast India (Saikia and Deka, 2013; Kaini et al., 2026). Besides, the plant is used for treating different ailments such as anaemia (Adeyemi et al., 2018; Airaodion et al., 2019), diabetes (Xu et al., 2015), cardiovascular diseases (Olorunnisola et al., 2016; Airaodion, 2019), hepato-disorders (Liang et al., 2011), and neuro-disorders (Ofusori et al., 2008).

T. fruticosum found in Ballavpur Wildlife Sanctuary, Birbhum, West Bengal, was observed to be consumed by the cattle as natural fodder; however, its consumption or uses by local people was unfounded.

Identification key to the species of the family Talinaceae in India

1a. Peduncle triangular……*Talinum fruticosum*
1b. Peduncle cylindrical……..…… 2
2a. Capsule orange to reddish brown……..…*Talinum paniculatum*
2b. Capsule yellowish……...……*Talinum portulacifolium*

4. CONCLUSION

Talinum fruticosum (L.) Juss. (Talinaceae: Caryophyllales) was reported from other parts of the country viz., Karnataka, Kerala, Tamil Nadu, Assam, and Manipur. However, the present study is the first to report from the state expanding its distributional range to Ballavpur Wildlife Sanctuary, Birbhum District, West Bengal. The species can be easily distinguished from other closely related species *T. portulacifolium* by its distinctly triangular peduncle, prominent 3-vented sepaloid structures, and tuberculate seeds.

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Author contributions

Shamim Alam: field survey, documentation and drafting of the manuscript
Sandipan Chatterjee: reviewed the literature, analysed and revised the script.
Adani Lokho: supervised the work and prepared the manuscript.

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Conflict of Interest

The authors declare that they have no conflicts of interest, competing financial interest or personal relationship that could have influenced the work reported in this paper.

Informed consent

Not applicable.

Ethical approval & declaration

In this article, as per the plant regulations followed in the Department of Botany, Visva-Bharati (A Central University), Santiniketan-731235, Birbhum, West Bengal, India; the authors observed the *Talinum fruticosum* (L.) Juss., an introduced species, collected from the Ballavpur Wildlife Sanctuary, Birbhum District, West Bengal and recorded its first extended distribution, an addition to the state flora. The ethical guidelines for plants & plant materials are followed in the study for species observation, identification & experimentation.

Data and materials availability

All data associated with this study are present in the paper.

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