

Passiflora foetida var. *ellisonii* vanderplank (Passifloraceae): New record from India

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Abstract

Background: We report the first record of *Passiflora foetida* var. *ellisonii* Vanderplank, belongs to the family Passifloraceae, earlier known only from New Guinea and Western Australia, first time reported from Anamalai Tiger Reserve forest (Hills region), state of Tamil Nadu, India.

Methods: We collected *Passiflora foetida* var. *ellisonii* Vanderplank, during field expeditions in February 2016 at Anamalai Tiger Reserve forest, Southern Western Ghats of India.

Significance: This find contributes to knowledge of climbing flora of Western Ghats and expands the geographic distribution of this species in India. We also provide a taxonomic description, illustrations occurrence and identification key for all the species of *Passiflora* that occur in Southern Western Ghats.

Keywords: *Passiflora foetida* var. *ellisonii* Vanderplank, new record, Southern Western Ghats, India and Asian continent

1. Introduction

Over the last few decades, a number of developing countries have become potential zones and recipients of alien species from other countries due to fast economic globalization and associated activities in trade and transport. The expanding economy of India has triggered vast infrastructural developmental projects that has led to loss of natural habitats and further opened up the disturbance corridors for providing niche to the establishment and spread of alien species [1]. These alien plants have either escaped from cultivation, spread after unintentional introduction, are casuals or naturalized to adapt with the changing environment. Majority of alien flora in India has its native range in South America, Asia, Africa, Europe and Australia. Biological diversity of India is among the most significant and richest in the world. With just over two percent of the world's landmass (329 million hectares), it has about seven percent of living resources, one third of which are land bounded. As many as 45,000 species of plants have so far been recorded from here. Further, it is estimated that 5,285 species of angiosperms belongs to 140 genera are endemic to the country [2]. In India, particularly the state of Tamil Nadu is a shelter of many aliens and the rich biodiversity is under several threats due to overexploitation, recurrent floods and cyclone followed by land degradation and soil erosion. The state harbours an estimated number of 5000 species of vascular plants representing about one-fifth of the total flora of India.

The great extent of the state coupled with wide variation in edaphic, topographic and climatic factors contributes to the enormous genetic variation of crops, landraces, aliens, wild/weedy relatives and particularly in wild indigenous economic species holding great promise for the future. Many wild plants/wild relatives used by the primitive tribes have the potential for use by the others as food, medicine and other necessities. *Passiflora* L., belonging to the family

Passifloraceae is diversified genus of economically useful, medicinal and edible importance, associated with various Indian cultural traditions. It is highly valued for its therapeutic properties in traditional as well as modern pharmacological system. It comprises c. 430 species, and distributed chiefly in the tropical and subtropical regions of the world [3, 4]. Indo Malaysian – Pacific regions represented by 20 species [5]. In India represented by 23 species were occurred in wild [6], Flora of British India had reported five species [7], Flora of Presidency of Madras reported four species [8]. Srinivasan 1983 reported 11 species from Tamil Nadu. While *Passiflora foetida* is naturalized through the old world Tropics is an alien weed [9]. Some species of *Passiflora* are grown in garden and nurseries as horticulture domesticates and *Passiflora edulis* Sims is presently cultivated in some part of India because of its used as edible purposes of food and drinks. Recently some species were reported from addition to the Indian flora viz., *Passiflora jugorum* W.W. Sm., is reported for the first time from India as a new distributional record [10] *Passiflora suberosa* L. (Passifloraceae) reported for the first time from Orissa or broadly from eastern India [11].

During the floristic study of the family Passifloraceae of the Western Ghats, India specimens of *Passiflora* spp. were collected from different localities of Western Ghats in different seasons. Although some specimens collected in rainy season resembled *Passiflora foetida* var. *ellisonii* Vanderplank in general appearance, they were distinguished on the basis of the following features: delicate plant, presence of villous vestiture, and having numerous reniform seeds. However, this species has a very restricted distributional area in India and not reported elsewhere as natural born. The wild occurrence of *Passiflora foetida* var. *ellisonii* Vanderplank in the Southern Western Ghats of India and the authors collected an interesting invasive climbing species from Anamalai Tiger Reserve forest,

Tamil Nadu, India. After critical studies and consultation with specimens deposited at MH (Botanical Survey of India) Coimbatore, it was identified as resulted *Passiflora foetida* var. *ellisonii* Vanderplank (Passifloraceae).

2. Materials and Methods

During the exploration mission in 2013–2017 for collection of medicinal and edible climbing plants in Western Ghats of Tamil Nadu, the first author observed the natural occurrence of one *Passiflora* species at locations in Perumal mudi (Anamalai hills region) Coimbatore district belongs to different phyto-geographical zones of the state. The plant specimens bearing both vegetative and flowering parts were deposit in the herbarium of Bharati Herbarium, Department of Botany, Bharathiar University, Coimbatore for future verification. The herbarium specimens were critically studied and cross-checked with the references cited in the Indian literature and abroad and the morphological features of the plant were examined using the trinocular lens and dissection microscope and the distinctive characters were described. The collected specimens were also compared with the images of the authentic literature and the identity of the plant. The photo graphs of the vegetative, flowering/fruitlet and the seeds along with associated species in the natural habitat were taken reference for future use. We present a brief morphological description of the species, comments, distribution and include colour photographs, Illustration and Herbarium specimen. The specimens were poisoned, pressed and labeled by standard herbarium method [13]. The correct identity of the herbarium specimens were confirmed by further critical study with the help of authentic specimens deposited in the Madras Herbarium (MH), of Botanical Survey of India (BSI), Southern Circle, Coimbatore. Additional the geographical distribution of species was obtained by using specialized literature.

3. Results and discussion

After thorough examination of the vegetative and floral characters of live plants grown at the experimental plots of the centre coupled with study on herbarium specimens and perusal of literature [14]. It was observed that the plant was found growing luxuriantly in wild habitats and its occurrence has been recorded at only one location of Perumal mudi (Anamalai) Coimbatore district, Tamil Nadu, India. Apart from these localities, there is no authentic record on the wild distribution of this species in India.

On verification of major published Indian literature regarding distribution [15, 16, 17]. It was found that it has not been reported till date in wild state from India. Therefore, the present collection counts an addition of species to the flora of India and forms a new distributional record for India. A detailed taxonomic description on morphology of different parts of the plant species along with field photographs (Figs. 1-3), ecology and also provide the key for easy identification and sustainable utilization.

3.1. Taxonomic description

Passiflora L.

Key to species of some related species in India

1a. Bracts not entire.....2

- b. Bracts entire or caduceus.....3
 2a. Flower white with bluish to central; fruit globose.....5. *P. foetida*
 b. Flower white with mauve; fruit ovoid.....6. *P. foetida* var. *ellisonii*
 3a. Leaves entire.....4
 b. Leaves lobed or palmatifid.....5
 4a. Branches quadrangular; berry obovoid.....1. *P. alata*
 b. Branches cylindrical; berry ovoid.....9. *P. ligularis*
 5a. Stipules lanceolate.....4. *P. edulis*
 b. Stipules other than lanceolate.....6
 6a. Corona bluish or purple.....3. *P. caerulea*
 b. Corona white.....2. *P. calcarata*
 7a. Glands present to the petiole; corona white.....10. *P. leschenaultia*
 b. Glands absent; corona other than white.....8
 8a. Leaves coriaceous; corolla tube present.....9. *P. mollissima*
 b. Leaves slightly thin; corolla tube absent... 7. *P. incarnata*

3.2 Plant description

Passiflora foetida var. *ellisonii* Vanderplank var. nov. Type. A Revision of *Passiflora* Section *Dysosmia*. *Curtis's Botanical Magazines*, 30 (4): 380-382. 2014.

Stem terete, pubescent; Stipules into subulate gland tipped divisions. Petioles 3–cm long, green-Pink, pubescent. Leaves ca. 9cm long, 3–6cm wide, shallowly lobed, sometimes entire, pubescent on abaxial and adaxial surfaces, margin entire with gland tipped cilia, cordate at base. Peduncles ca.4cm long, one per node. Bracts 2–3cm long, bipinnatisect with gland tipped segments. Flowers white, –5.5cm in diameter. Sepals ovate-lanceolate, 2–3cm long. Petals lanceolate, 1–2.5cm long, 5–8mm wide, white on adaxial and abaxial surfaces. Corona filaments in five series, the outer two series, filiform, white with a faint tint of mauve at the tips and base, inner series 1–2mm long, stamens coherent at base, style three, pale green. Ovary ovoid or sub-globose, pilose ca. 3mm. Fruit ovoid to globose, stiff hairy, becoming deciduous, 1.5–2cm in diameter. Seed compressed, flattened, scutiform, reticulate on both surfaces, 4–4.5mm long 2–2.5mm wide.

Phenology: October – March

Ecology: The plant species was found to be naturally growing in wild habitats among other species interspersed with herbs, shrubs and climbers in different landscapes, a reserved forest and a partly disturbed Hills area. One accession from a population of few plants was collected from top hills and evergreen and moist areas respectively. It was observed that the species has good compatibility with evergreen and moist deciduous elements like (*Wrightia tinctoria*, *Evolvulus alsinoides*). Present species occurrence in Anamalai Tiger Reserve Forest areas (Perumal Mudi) of Southern Western Ghats, Tamil Nadu. These hills are located between 10° 13' and 10° 31' N. and 76° 52' and 77° 23' E.

Habitat: Distributed in moist deciduous forests in Rockery hill regions, to 700 MSL.

Distribution: INDIA, (Tamil Nadu, Anamalai Tiger Reserve Forest), New Guinea and Western Australia.

Specimens examined: A. Sarvalingam, A. Rajendran & R. Sivalingam (Bharathi Herbarium -006381, Fig. 3).

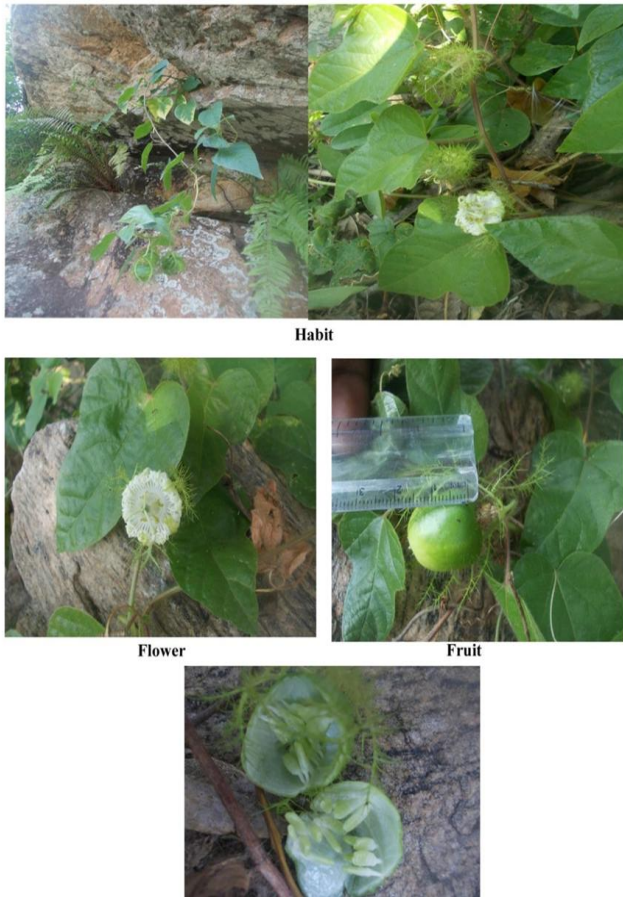
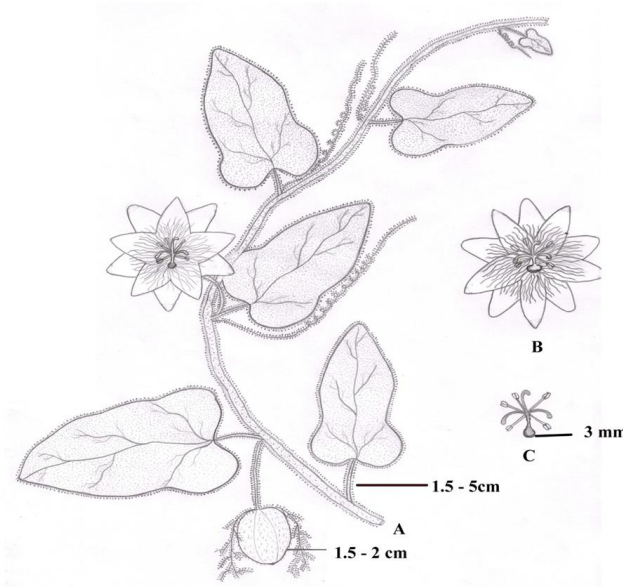


Fig 1: Natural habits of *Passiflora foetida* var. *ellisonii* Vanderplank



A. Habit; B. Flower; C. Ovary with pistil

Fig 2: Illustration of *Passiflora foetida* var. *ellisonii* Vanderplank (paasifloraceae)

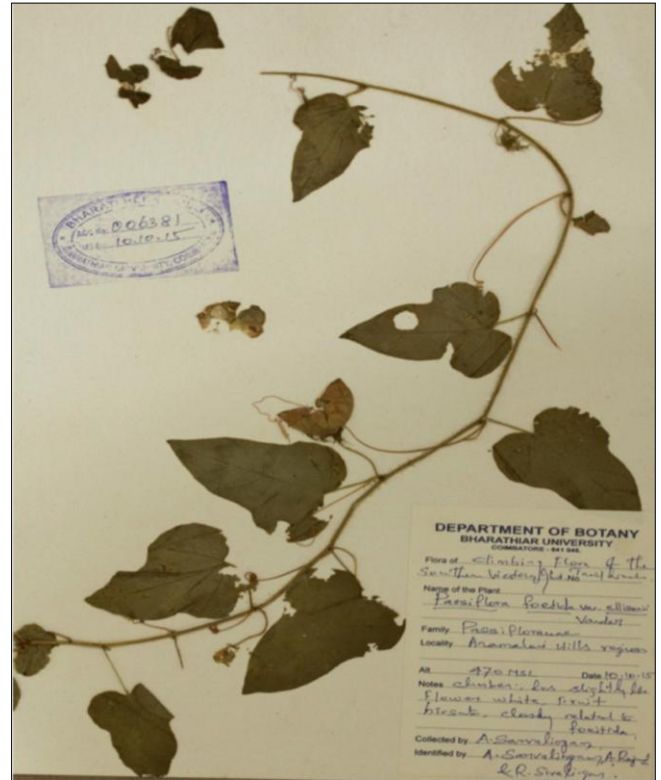


Fig 3: Deposited herbarium specimen

5. Conclusion

Plant cover in the sites where we collected these species is composed predominantly of moist vegetation. Passion flower is one of the most beautiful flowers of all flowers and distributed worldwide from S. America to Europe and Asia etc., few species were only wildy found in India. The species *Passiflora foetida* var. *ellisonii* Vanderplank a new addition to the flora of India. This species is totally different from *Passiflora foetida* and flourishing very well at the altitudinal range of 700 MSL in moist habitats of different localities in the Western Ghats range of Tamil Nadu. This report provides the distributional limit of the species in the Western Ghats of India distributional limit in Asia. This species has not been re-reported westward beyond this limit in South Asia till date. Although its successful spread from India indicates that it may spread Western Ghats in future. *Passiflora foetida* var. *ellisonii* Vanderplank, species only found in native of New Guinea and has been introduced to Western Australia and UK as an invasive weed and its cultivated (Henry *et al.* 1989). It has neither been collected nor reported from India. So far is a first time reported from addition to the Indian floras?

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