

ORIGINAL ARTICLE



Phyto Diversity of New Hosts of *Dendrophthoe gamblei* Recorded from Different Geographical Regions of South Karnataka

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Abstract

Loranthaceae and *Viscaceae* are the two important parasitic families of the flowering plants. The present communication reports taxa parasitized by *Dendrophthoe gamblei*. These hosts belonging to 19 genera and 19 species distributed in 10 different families of angiosperms in 4 southern districts of Karnataka. These hosts are recorded for the first time in India. These hosts are endemic, host specific and interesting plant species for this stem parasite. The adaptability, host range, preference and host specificity are discussed in the light of existing literature.

Keywords: *Dendrophthoe gamblei*; Loranthaceae; Mistletoe; Host Range

1. Introduction

Parasitic phanerogams are extremely interesting group of dicotyledonous species which attract the man since the time immemorial. Mistletoes (members of Loranthaceae and Viscaceae) are the dominant group of angiospermic shoot or stem hemiparasites which are found to grow on the branches of host shrubs and trees, absorb water and organic solutes directly from the host vasculature. These

are notorious parasites capable of destroying the economically important plants. It can also cause serious threat to silviculture and horticultural crops [1].

Many studies have already indicated that the host parasite relationship of other species of *Dendrophthoe* [2]. Most of the fruit and timber yielding trees are seriously damaged with mistletoes [3]. The effects of mistletoes on their hosts

can include decreased growth and vigor, poor fruit set or yield, malformed woody tissues, sparse foliage, top withering, susceptibility to insect and other disease attacks and early death [1]. The list of hosts that have been attacked by other species of *Dendrophthoe* are enlisted, while *Dendrophthoe gamblei* is seriously lacking. The present study reports the range of the host plants for *D. gamblei* from southern districts of Karnataka.

1.1 Study Area

The study area [Fig. 1] is located between 76°. 25'. 25". 00" E to 78°. 15'. 00" E longitude and 14°. 30'. 00" N to 11°. 30'. 00" N latitude. It comprises 5 districts which are bordered by Andhra Pradesh and Tamil Nadu states and covers mainly Tumkur, Chikkaballapura, Bengaluru (Rural), Ramanagera and Chamarajanagara Districts. Sampling areas includes the forests of Revanasiddeswara Betta of Ramanagera taluk and district, Siddara Betta of Tumkur district's Koratagere taluk, Barachukki falls forest of Chamarajanagara district's Kollegal taluk, Road sides along Hyderabad-Bengaluru Highway near Devanahalli taluk of Bengaluru rural district and Kanive road of Chikkaballapura taluk and district.

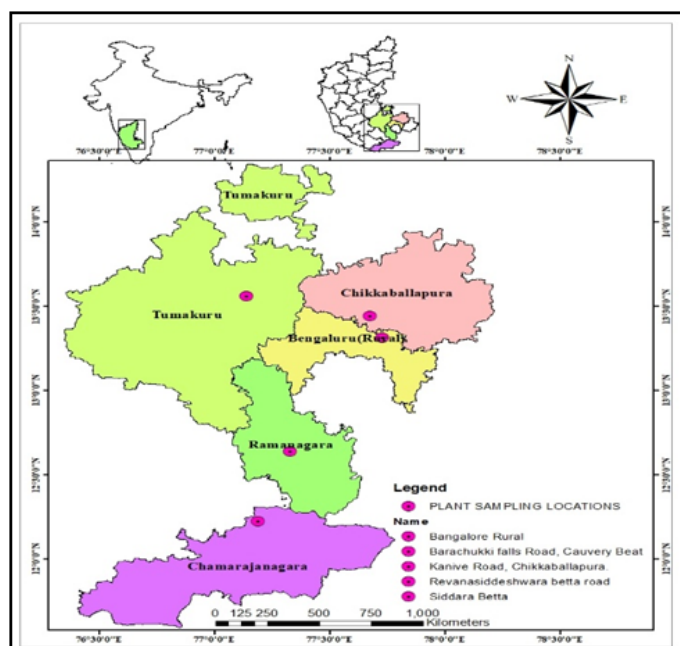


Fig.1. Study Area Map

1.2 Objective

To Study and document the diversity of new hosts of *D. gamblei* from different geographical regions of

South Karnataka.

1.3 Materials and Methods

Frequent field trips were undertaken to different geographical regions of Southern Karnataka. The current study was carried out during 2018 and 2023 to gather plant specimens from the Loranthaceae family. The collected host specimens were brought to the laboratory and identified with the help of Flora of the Presidency of Madras [4], Flora of the Presidency of Bombay [5] and Flora of Karnataka Vol-II [6]. For collection and preservation of plants, the methods outlined by [7] were followed.

2. Results and Discussions

D. gamblei shows a wide range of hosts and occurs on shrubs as well as woody tree species including wild and cultivated taxa. Almost 7 species of the host belong to the subfamily Caesalpinioideae of the family Fabaceae, three species in Rutaceae, two species in Rhamnaceae and remaining 7 hosts distributed one each in Meliaceae, Muntingiaceae, Boraginaceae, Malvaceae, Sapotaceae, Lythraceae and Apocynaceae [Table. 1].

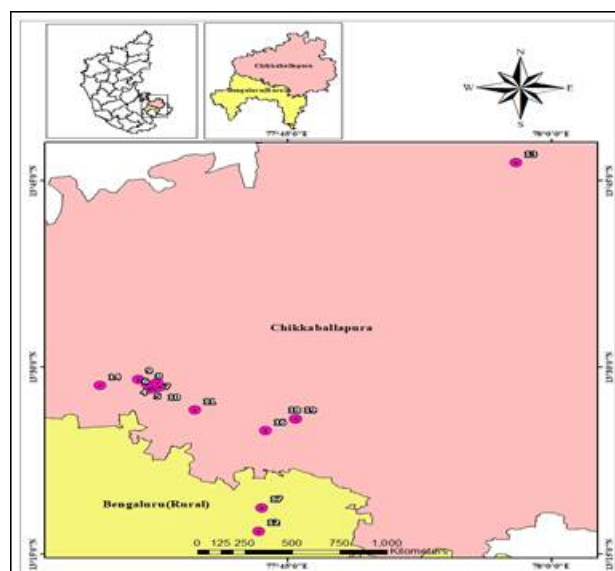


Fig.2. Sampling Locations of *D. gamblei* with its New Hosts

A total of 19 species belongs to 19 genera and 10 different families were recorded as new hosts of *D. gamblei* for the first time India [Fig. 2][Fig. 3][Fig. 4]. All the host plants were identified up to the species rank. The number of host

species recorded ranged from 1 to 7. All the recorded host species were dicotyledonous angiosperms without even a single taxa from monocotyledons and none were herbaceous.

The current catalogue of the host species *D. gamblei* in southern geographical regions of Karnataka indicated a

Table 1. New hosts parasitized by *D gamblei* and its distribution on hosts

Sl.No	Hosts parasitized by <i>D gamblei</i>	Family and sub-family	Mistletoe status	Host status
1	<i>Acacia auriculiformis</i> <i>A.Cunn. ex Benth</i>	Fabaceae Subfamily: Caesalpinioideae	moderate	Exotic
2	<i>Pithecelobium dulce</i> (Roxb.) Benth	Fabaceae Subfamily: Caesalpinioideae	robust	Exotic
3	<i>Enterolobium cyclocarpum</i> (Jacq.) Griseb	Fabaceae Subfamily: Caesalpinioideae	robust	Exotic
4	<i>Citrus medica</i> L.	Rutaceae	strong	Exotic
5	<i>Melea dubia</i> Cav.	Meliaceae	weak	Indigenous
6	<i>Muntingia calabura</i> L.	Muntingiaceae	weak	Both
7	<i>Cordia dichotoma</i> G. Forst.	Boraginaceae	weak	Exotic
8	<i>Gossypium arboretum</i> L.	Malvaceae	weak	Indigenous
9	<i>Vachellia tortilis</i> (Forssk.) Galasso & Banfi	Fabaceae Subfamily: Caesalpinioideae	moderate	Exotic
10	<i>Senegalia ataxacantha</i> (DC.) Kyal. & Boatwr.	Fabaceae Subfamily: Caesalpinioideae	weak	Exotic
11	<i>Ziziphus nummularia</i> (Burm.f.) Wight & Am.	Rhamnaceae	moderate	Exotic
12	<i>Manilkara zapota</i> (L.) P. Royen	Sapotaceae	robust	Exotic
13	<i>Ziziphus mauritiana</i> Lam.	Rhamnaceae	moderate	Both
14	<i>Punica granatum</i> L.	Lythraceae	moderate	Exotic
15	<i>Albizia lebbek</i> (L.) Benth	Fabaceae Subfamily: Caesalpinioideae	robust	Exotic
16	<i>Samanea saman</i> (Jacq.) Merr.	Fabaceae Subfamily: Caesalpinioideae	robust	Exotic
17	<i>Citrus maxima</i> (Burm.) Merr.	Rutaceae	moderate	Exotic
18	Citrus limon (L) Osbeck	Rutaceae	strong	Both
19	<i>Nerium oleander</i> L.	Apocynaceae Sub family: Apocynoideae	Strong	Exotic

Host range refers to the total number of plant species that can be parasitized. If the parasite appears on only one group of hosts and not others, such conditions may be

great diversity of plant species which can be parasitized. It would appear that no shrub or tree is immune to this parasite attack under right conditions. In addition it is very important to distinguish the terms like host range, host preference and host specificity.

considered as host preference. Based on limited number of host species, it can be called as host specific.

These understanding of the interaction between parasitic angiosperms and their host species lags behind that of



these plant symbiotic association [8]. Two host species such as *Albizia amara* (Roxb) Boivin and *Strychnos colubrina* L. [9]. As of now 21 species are recorded as hosts to *D. gamblei* including 19 new hosts recorded during the present investigation.



Fig. 3. *D. gamblei* parasitized hosts A. *Acacia auriculiformis* A. Cunn ex Benth.; B. *Albizia saman* (Jacq.) Merr; C. *Enterolobium cyclocarpum* (Jacq.) Griseb; D. *Pithecelobium dulce* (Roxb.) Benth; E. *Melea dubia* Cav.; F. *Citrus medica* L.; G. *Muntingia calabura* L; H. *Cordia dichotoma* G. Forst; I. *Gossypium arboreum* L.Forst.

3. Conclusions

Until now the knowledge of host species for *D. gamblei* has not been documented. The current study establishes a

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baseline for the study of host mistletoe combination in Karnataka. There is no host specificity for *D. gamblei* hence during the present investigation a total of 19 host species of dicotyledonous angiosperms were recorded as new hosts for the first time in India.



Fig. 4. Parasitized hosts of *D. gamblei* J. *Punica granatum* L.; K. *Ziziphus mauritiana* Lam.; L. *Citrus maxima* (Burm.) Merr.; M. *Manilkara zapota* (L.) P.Royen; N. *Ziziphus nummularia* (Burm.f.) Wight & Arn.; O. *Senegalia ataxacantha* (DC.) Kyal. & Boatwr; P. *Vachellia tortilis* (Forssk.) Galasso & Banfi; Q. *Citrus limon* (L) Osbeck; R. *Nerium oleander* L.

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