
Short communication

Host plant and distribution of *Cassytha filiformis* L. (Lauraceae) in Odisha state, India

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Article Details: Received: 2024-11-25 | Accepted: 2024-12-23 | Available online: 2024-12-24



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Abstract: *Cassytha filiformis*, a parasitic plant species, is widely distributed in Odisha, India. It has ethnomedicinal uses. Present study aimed to document the host plants and distribution of *C. filiformis* in different districts of Odisha. Field surveys were conducted across 11 districts, and a total of 51 host plant species were identified. The results revealed that *C. filiformis* exhibits a wide host range, parasitizing plants belonging to various families. The study provides valuable information on the distribution and host plants of *C. filiformis* in Odisha, which can be useful for developing effective management strategies to control the spread of this parasitic plant species and its plant parts may be used to formulate the future pharmacological agents.

Keywords: Host plants, parasitic plants, management

Odisha is a home of many parasitic plant species (Sahu et al., 2018; Mahendru et al., 2022). Among them, *Cassytha filiformis*, a holoparasitic plant species, is a significant threat to agricultural and forest ecosystems worldwide (Sahu et al., 2018). It belongs to the family Lauraceae (Jaiswal et al., 2021). It is also known to parasitize a wide range of host plants, causing significant damage to crops, forests, and natural habitats. It has been reported to infest various plant species, including trees, shrubs, and herbaceous plants (Rosli et al., 2024). In India, *C. filiformis* is widely distributed across various states, including Odisha, where it is considered a significant weed species. Despite its ethnomedicinal uses (Jaiswal et al., 2021; Lyngdoh et al., 2023), there is a lack of comprehensive information on the host plants and distribution of *C. filiformis* in Odisha. Therefore, present study aims to bridge this knowledge gap by documenting the host plants and distribution of *C. filiformis* in different districts of Odisha, providing valuable insights for the development of effective management strategies to control the spread of this parasitic plant species. Morphologically, *C. filiformis* closely resembles to the genus *Cuscuta*. They are parasitic twining vines (Mishra et al., 2022; Rajamanickam et al., 2022). Stems are

green to orange color, filiform and glabrous, slightly woody, and threadlike, measuring 3-8 m in length, rusty pubescent when young but sparsely pubescent when mature. Leaves modified to minute scale, 1 mm long. Found near the tip of stems, bracts, and bracteoles brown, minute, broadly ovate. Flowers are bisexual, small, sessile, and few in spicate inflorescences, and borne in small panicles. The fruit is small, fleshy, smooth, and berry-like, 7 mm in diameter with a single spherical seed (Plate 1; Saxena and Brahmam, 1995).

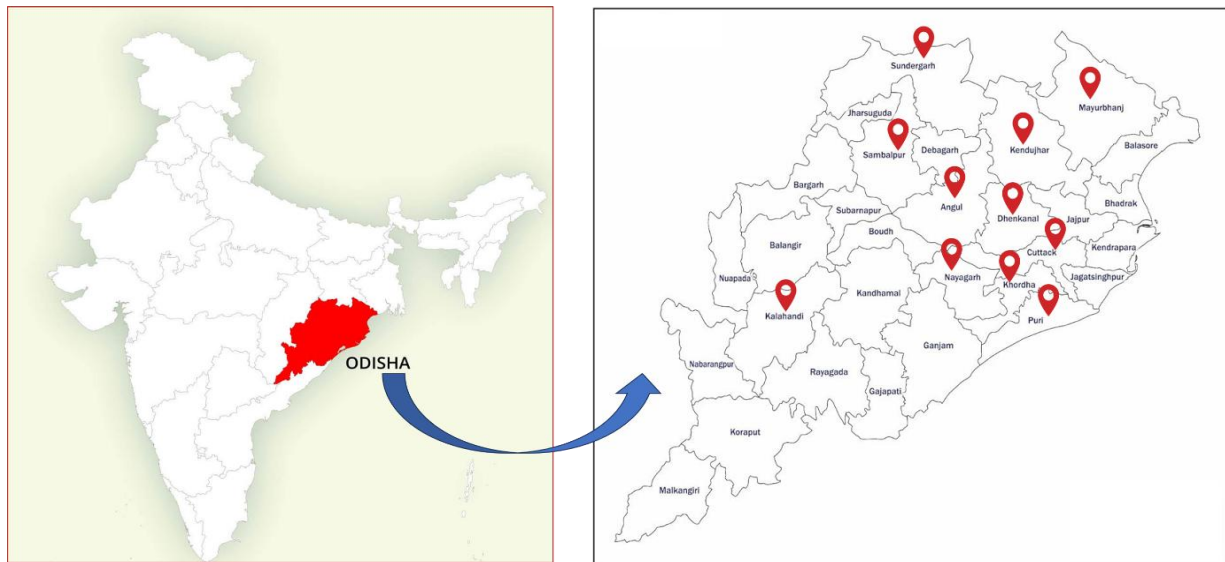


Figure 1: Geographical location of study areas

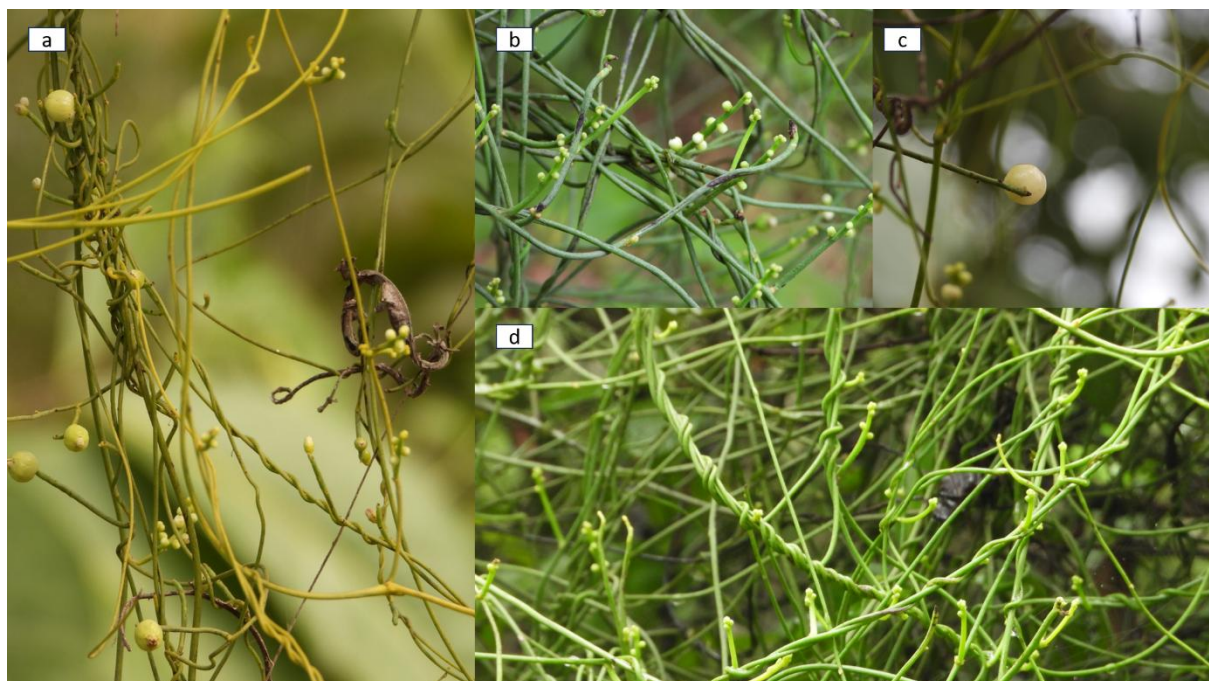


Plate 1: Vegetative parts of *Cassytha filiformis*, a) Whole plant, b) Flowers, c) Fruits, d) Attachment to the host plant

C. filiformis can parasitize and potentially kill their host plants by attacking the roots and draining nutrients. They are capable of invading virtually all green plants, including food crops, with dodder primarily affecting herbaceous plants and woe vine attacking woody plants (Zhang et al., 2022). However, there are exceptions. This vine can transmit a variety of plant diseases, including viruses, fungi, phytoplasmas, and bacteria. In plant pathology, parasitic plants like *C. filiformis* are classified as distinct pathogens (Nelson, 2008; Rosli et al., 2024). They cause diseases through infection by attaching to their host plants and extracting nutrients and water through haustoria. *C. filiformis* uses specialized feeding structures called haustoria to attach and penetrate the host plant's tissues, drawing nutrients and water from the phloem and xylem (Mishra et al., 2022). The haustorium does not directly contact the host plant's cytoplasm but invaginates the plasmalemma membrane. The pathogen's goal is to extract nutrients and water without immediately killing the host cells, which allows the host plant to suffer a slow, prolonged death by starvation and desiccation (Nelson, 2008; Zhang et al., 2022). If infestation levels are high, the host plants can be smothered and eventually killed, particularly affecting coastal habitats and reforestation projects. *C. filiformis* represents a significant threat to lowland reforestation projects due to its potential to damage young plants and they may kill plants (Nelson, 2008; Zhang et al., 2022; Rosli et al., 2024). A total of 51 host plant species belonging to 24 families were identified as hosts of *C. filiformis* in Odisha, India (Figure 1; Table 1). The most common host plants were *Chromolaena odorata* (13.4%), *Vitex negundo* (11.4%), and *Azadirachta indica* (8.5%). Other notable host plants included *Acacia nilotica*, *Anogeissus acuminata*, and *Lantana camara*. The distribution of *C. filiformis* was widespread across the 11 districts surveyed, with the highest incidence reported in the districts of Cuttack, Khurda, and Mayurbhanj. The parasite was found to infest host plants in a variety of habitats, including forests, agricultural fields, and wastelands.

Table 1: Host plant and distribution of *Cassytha filiformis* in selected districts of Odisha

District	Longitude	Latitude	Elevation(m)	Host plant
Angul	N 20°50'57"	E 84°52'46"	217.09	<i>Chromolaena odorata</i>
	N 20°47'15"	E 84°47'19"	250.49	<i>Chromolaena odorata</i>
	N 20°47'52"	E 84°48'36"	318.99	<i>Clerodendrum infortunatum</i> & <i>Azadirachta indica</i>
	N 20°48'14"	E 84°48'54"	330.56	<i>Lantana camara</i>
	N 20°49'26"	E 84°51'13"	253.7	<i>Chromolaena odorata</i>
	N 20°51'11"	E 84°54'15"	201.81	<i>Chromolaena odorata</i>
	N 20°51'14"	E 84°54'37"	186.84	<i>Acacia nilotica</i>
	N 20°46'34"	E 85°0'60"	159.23	<i>Clerodendrum infortunatum</i>
	N 20°46'17"	E 85°1'8"	165.12	<i>Clerodendrum infortunatum</i>
Cuttack	N 20°26'24"	E 85°52'13"	47.43	<i>Ipomoea carnea</i>

	N 20° 26' 37"	E 85° 52' 7"	23.48	<i>Trewia nudiflora</i>
	N 20° 26' 53"	E 85° 49' 54"	53.01	<i>Chromolaena odorata</i>
	N 20° 26' 35"	E 85° 46' 49"	51.31	<i>Azadirachta indica</i>
	N 20° 26' 16"	E 85° 45' 4"	71.87	<i>Calotropis gigantea</i>
	N 20° 26' 17"	E 85° 44' 45"	71.86	<i>Azadirachta indica</i>
	N 20° 27' 10"	E 85° 42' 58"	29.71	<i>Glycosmis pentaphylla</i>
	N 20° 26' 44"	E 85° 40' 54"	31.76	<i>Anacardium occidentale</i>
	N 20° 26' 48"	E 85° 40' 42"	28.84	<i>Azadirachta indica</i>
	N 20° 26' 51"	E 85° 40' 40"	33.79	<i>Anogeissus acuminata</i>
	N 20° 27' 15"	E 85° 40' 40"	39.37	<i>Anacardium occidentale</i>
	N 20° 28' 37"	E 85° 38' 53"	70.35	<i>Benkara malabarica</i>
	N 20° 30' 20"	E 85° 38' 19"	85.03	<i>Anogeissus acuminata</i>
	N 20° 30' 39"	E 85° 36' 59"	77.27	<i>Anogeissus acuminata</i>
	N 20° 30' 3"	E 85° 36' 22"	72.8	<i>Dalbergia sissoo</i>
	N 20° 28' 23"	E 85° 34' 49"	60.07	<i>Simarouba glauca</i>
	N 20° 24' 14"	E 85° 35' 29"	41.33	<i>Pithecellobium dulce</i>
	N 20° 20' 59"	E 85° 25' 43"	38.91	<i>Calotropis gigantea</i>
	N 20° 25' 33"	E 85° 43' 31"	41	<i>Hugonia mystax</i>
	N 20° 25' 97"	E 85° 41' 71"	46.02	<i>Bauhinia acuminata</i>
Dhenkanal	N 20° 40' 42"	E 85° 43' 17"	107.35	<i>Chromolaena odorata</i>
	N 20° 49' 9"	E 85° 23' 5"	78.96m	<i>Chromolaena odorata</i>
	N 20° 52' 48"	E 85° 49' 48"	64.40m	<i>Woodfordia fruticosa</i>
	N 20° 41' 54"	E 85° 46' 2"	146m	<i>Vitex negundo</i>
Kalahandi	N 19° 54' 45"	E 83° 6' 44"	244.78	<i>Acacia nilotica</i>
	N 19° 38' 1"	E 82° 53' 39"	180.75	<i>Celotropis gentia</i>
	N 19° 54' 21"	E 83° 9' 37"	260.58	<i>Aegle marmelos</i>
	N 19° 50' 31"	E 82° 56' 1"	224.77	<i>Anogeissus acuminata</i>
	N 19° 34' 54"	E 82° 51' 23"	246.88	<i>Mangifera indica</i>
	N 19° 34' 38"	E 82° 51' 46"	246.56	<i>Lantana camara</i>
	N 19° 32' 46"	E 82° 49' 4"	246.1	<i>Chromolaena odorata</i>
	N 19° 33' 55"	E 82° 48' 57"	261.88	<i>Azadirachta indica</i>
	N 19° 34' 5"	E 82° 48' 56"	354.27	<i>Acacia nilotica</i>
Keonjhar	N 21° 18' 22"	E 86° 3' 41"	45.19	<i>Mangifera indica</i>
	N 21° 18' 1"	E 86° 4' 20"	44.72	<i>Mangifera indica</i>
	N 21° 9' 49"	E 86° 7' 18"	29.37	<i>Anogeissus acuminata</i>
	N 21° 4' 24"	E 86° 6' 35"	44.39	<i>Acacia nilotica</i>
	N 21° 10' 37"	E 86° 7' 19"	43.15	<i>Anogeissus acuminata</i>
	N 21° 14' 10"	E 86° 5' 57"	14.3	<i>Samanea saman</i>
	N 21° 14' 40"	E 86° 7' 29"	43.88	<i>Rubus elliptica</i>

	N 21°16'26"	E 86°6'33"	47.01	<i>Tamarindus indica</i>
	N 21°18'23"	E 86°5'59"	11.47	<i>Azadirachta indica</i>
	N 21°12'54"	E 86°7'11"	15.8	<i>Albizia lebbeck</i>
	N 21°12'40"	E 86°7'51"	15.8	<i>Streblus asper</i>
	N 21°32'22"	E 85°32'11"	720.77	<i>Vitex negundo</i>
	N 21°32'23"	E 85°33'4"	770.91	<i>Vitex negundo</i>
	N 21°35'16"	E 85°25'14"	566.18	<i>Vitex negundo</i>
Khurdha	N 22°4'8"	E 86°56'54"	59.04	<i>Ziziphus maruntiana</i>
	N 21°47'2"	E 87°2'44"	43.22	<i>Anogeissus acuminata</i>
	N 21°49'13"	E 87°4'59"	32.93	<i>Bougainvillea spectabilis</i>
	N 22°14'19"	E 86°30'55"	96.55	<i>Vitex negundo</i>
	N 22°14'44"	E 86°30'3"	84.08	<i>Vitex negundo</i>
	N 22°16'10"	E 86°27'49"	106.22	<i>Vitex negundo</i>
	N 22°6'47"	E 86°33'46"	99.89	<i>Vitex negundo</i>
	N 21°52'5"	E 86°46'43"	62.76	<i>Vitex negundo</i>
	N 21°52'4"	E 86°46'44"	57.10	<i>Vitex negundo</i>
	N 21°45'32"	E 86°59'32"	21.09	<i>Vitex negundo</i>
	N 21°45'48"	E 86°59'32"	28.92	<i>Lantana camara</i>
	N 20°9'30"	E 85°37'50"	49.79	<i>Combretum roxburghii</i>
	N 20°9'0"	E 85°38'45"	45.34	<i>Carissa spinarum</i>
	N 20°9'1"	E 85°38'46"	49.74	<i>Azadirachta indica</i>
	N 19°52'5"	E 85°19'40"	31.71	<i>Jatropha gossypifolia</i>
	N 19°43'56"	E 85°11'6"	30.74	<i>Vachellia nilotica</i>
Mayurbhanj	N 21°24'4"	E 86°9'33"	240.8	<i>Ziziphus mauritiana</i>
	N 21°57'15"	E 86°4'7"	377.13	<i>Vitex negundo</i> , <i>Chromolaena odorata</i> .
	N 22°0'53"	E 86°7'54"	395.94	<i>Vitex negundo</i>
	N 21°58'13"	E 86°5'5"	406.67	<i>Mimosa pudica</i> , <i>Ipomoea carnea</i> , <i>Cassia occidentalis</i> , <i>Phyllanthus reticulatus</i>
	N 22°0'15"	E 86°4'27"	352.25	<i>Vitex negundo</i>
	N 22°1'25"	E 86°9'48"	314.5	<i>Vitex negundo</i>
	N 22°10'27"	E 86°26'37"	297.47	<i>Diospyros melanoxylon</i>
	N 22°2'15"	E 86°12'14"	295.43	<i>Diospyros melanoxylon</i>
	N 20°51'13"	E 84°53'33"	168.06	<i>Clerodendrum infortunatum</i>
Nayagarh	N 20°18'13"	E 85°19'9"	85.58	<i>Azadirachta indica</i>
	N 20°18'50"	E 85°18'20"	61.33	<i>Chromolaena odorata</i>

	N 20°19'48"	E 85°14'55"	119.4	<i>Alangium salvifolium</i>
	N 20°18'60"	E 85°9'54"	39.37	<i>Mikania micrantha</i>
	N 20°8'5"	E 85°8'23"	80.39	<i>Mikania micrantha</i>
	N 20°9'4"	E 85°10'31"	74.83	<i>Bougainvillea spectabilis</i>
	N 20°9'36"	E 85°13'17"	62.11	<i>Chromolaena odorata</i>
	N 20°9'37"	E 85°12'29"	79.19	<i>Acacia nilotica</i>
	N 20°9'36"	E 85°13'17"	62.11	<i>Acacia nilotica</i>
	N 20°9'28"	E 85°14'10"	67.37	<i>Azadirachta indica</i>
	N 20°9'39"	E 85°14'55"	72.52	<i>Mikania micrantha</i>
	N 20°9'57"	E 85°15'32"	16.24	<i>Mikania micrantha</i>
	N 20°9'58"	E 85°15'33"	70.68	<i>Anogeissus acuminata</i>
	N 20°10'21"	E 85°17'10"	97.24	<i>Ipomoea carnea</i>
	N 20°10'22"	E 85°19'13"	113.87	<i>Acacia nilotica</i>
Puri	N 19°53'48"	E 86°6'44"	24.14m	<i>Eugenia roxburghii</i>
	N 19°49'21"	E 85°51'53"	13.82	<i>Casuarina equisetifolia</i>
	N 19°49'16"	E 85°51'28"	13.21m	<i>Mikania micrantha</i>
	N 19°49'41"	E 85°50'4"	33.06m	<i>Casuarina equisetifolia</i>
Sambalpur	N 21°45'33"	E 84°32'33"	241.39	<i>Vitex negundo</i>
	N 21°45'28"	E 84°32'51"	249.00	<i>Chromolaena odorata</i>
	N 21°45'11"	E 84°36'28"	301.08	<i>Vitex negundo</i>
	N 21°45'26"	E 84°36'30"	290.15	<i>Vitex negundo</i>
Sundargarh	N 21°42'3"	E 85°6'36"	172.99	<i>Vitex negundo</i>
	N 21°43'3"	E 85°9'6"	336.62	<i>Mallotus philippensis</i>
	N 21°50'45"	E 84°31'48"	290.02	<i>Vitex negundo, Alstonia scholaris</i>
	N 21°50'48"	E 84°47'34"	189.98	<i>Shorea robusta</i>
	N 21°49'26"	E 84°54'20"	161.15	<i>Schleichera oleosa</i>
	N 21°49'44"	E 84°56'18"	90.29	<i>Ziziphus mauritiana</i>
	N 21°52'28"	E 85°0'58"	112.65	<i>Schleichera oleosa</i>
	N 21°53'10"	E 84°50'10"	166.07	<i>Shorea robusta</i>
	N 21°52'59"	E 84°51'20"	145.61	<i>Woodfordia fruticosa</i>
	N 21°43'11"	E 85°0'45"	91.69	<i>Cucurbita Sp.</i>
	N 21°42'39"	E 84°49'35"	172.39	<i>Vitex negundo</i>
	N 21°53'43"	E 84°42'20"	283.21	<i>Vitex negundo</i>

Present study provides a comprehensive overview of the host plants and distribution of *C. filiformis* in Odisha, India. Present study highlights the importance of understanding the host-plant relationships and distribution patterns of *C. filiformis* to develop effective management strategies. The findings of this study can be useful for agricultural and forest managers, policymakers, and researchers working on

weed management and plant protection. Future studies should focus on investigating the ecological impacts of *C. filiformis* on its host plants and the environment. Additionally, research on the development of effective management strategies, including biological control methods, would be beneficial for controlling the spread of this parasitic plant species. As it has ethnomedicinal uses, the plant parts of *C. filiformis* may be the raw materials for the development of future pharmaceutical agents.

Acknowledgement

Authors are thankful to the Dr. Sanjeet Kumar, Ambika Prasad Research Foundation, Odisha, India for identification of plant species. Authors are also thankful to the Science and Technology Department, Government of Odisha, Bhubaneswar, Odisha, India (Vide Approval Number – 4357/ST, dt. 21.10.2021) for financial support of present works. Authors are grateful to the local communities & forest officials of study areas.

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