Building evidence for conservation globally

Journal of Threatened Taxa

10.11609/jott.2025.17.4.26763-26938
www.threatenedtaxa.org

26 April 2025 (Online & Print)
17(4): 26763-26938
ISSN 0974-7907 (Online)
ISSN 0974-7893 (Print)

40 Years zoo reach Zoo Outreach Organisation

Open Access

ISSN 0974-7907 (Online); ISSN 0974-7893 (Print)

Publisher
Wildlife Information Liaison Development Society
www.wild.zooreach.org

Host
Zoo Outreach Organization
www.zooreach.org

Srivari Illam, No. 61, Karthik Nagar, 10th Street, Saravanampatti, Coimbatore, Tamil Nadu 641035, India
Registered Office: 3A2 Varadarajulu Nagar, FCI Road, Ganapathy, Coimbatore, Tamil Nadu 641006, India
Ph: +91 9385339863 | www.threatenedtaxa.org
Email: sanjay@threatenedtaxa.org

For Focus, Scope, Aims, and Policies, visit https://threatenedtaxa.org/index.php/JoTT/aims_scope
For Article Submission Guidelines, visit https://threatenedtaxa.org/index.php/JoTT/about/submissions
For Policies against Scientific Misconduct, visit https://threatenedtaxa.org/index.php/JoTT/policies_various

continued on the back inside cover

Cover: Nilgiri Large Burrowing Spider *Haploclastus nilgirinus*. Acrylic on canvas. © Aakanksha Komanduri.

Journal of Threatened Taxa | www.threatenedtaxa.org | 26 April 2025 | 17(4): 26879–26886

ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

https://doi.org/10.11609/jott.8974.17.4.26879-26886

#8974 | Received 16 February 2024 | Final received 05 April 2025 | Finally accepted 11 April 2025

OPEN ACCESS

COMMUNICATION

Notes on the interesting species *Tacca leontopetaloides* (L.) Kuntze

Sk. Md. Abu Imam Saadi [1], Mehebub Sarwar Hossain [2], Debasis Bhunia [3], Sk. Rasidul Islam [4], Sayantan Tripathi [5], Sanjit Sinha [6] & Amal Kumar Mondal [7]

[1,2] Molecular Plant Taxonomy Laboratory, Department of Biological Sciences, Aliah University, Newtown, Kolkata, West Bengal 700160, India.
[3] Department of Botany, Sree Chaitanya College, Habra, N-24 Parganas, West Bengal 743268, India.
[4,5,6,7] Plant Taxonomy, Biosystematics and Molecular Taxonomy Laboratory, Department of Botany & Forestry, Vidyasagar University, Midnapore, West Bengal 721102, India.
[1] saadivu@gmail.com (corresponding author), [2] mehebubsarwarhossain@gmail.com, [3] debasisbhunia.bot@gmail.com, [4] skrasidulislam1995@gmail.com, [5] tripathi.sayantan40@gmail.com, [6] sanjitbot@gmail.com, [7] amalcaebotvu@gmail.com

Abstract: *Tacca leontopetaloides* is a species of flowering plant that belongs to the family Dioscoreaceae. The species generally grows in forests and shady areas during rainy seasons. The populations of this species were previously reported to exist in eastern India (West Bengal), have been steadily declining at an increasing rate. Present investigation in four states of eastern India revealed that the species is now only present in the two districts of West Bengal, i.e., Jhargram and Paschim Medinipur. In order to facilitate easy identification and conservation, the article provides a detailed description of the species, including its distribution, conservation status, economic and medicinal importance, figures, and photographs, along with the LM and SEM images of pollen.

Keywords: Conservation, distribution, Jhargram, medicinal importance, Paschim Medinipur, sacred groves.

Editor: Asok Ghosh, The University of Burdwan, West Bengal, India. **Date of publication:** 26 April 2025 (online & print)

Citation: Saadi, S.M.A.I., M.S. Hossain, D. Bhunia, S.R. Islam, S. Tripathi, S. Sinha & A.K. Mondal (2025). Notes on the interesting species *Tacca leontopetaloides* (L.) Kuntze. *Journal of Threatened Taxa* 17(4): 26879–26886. https://doi.org/10.11609/jott.8974.17.4.26879-26886

Funding: The authors declare that no funds, grants, or other support were received during the preparation of this manuscript.

Competing interests: The authors declare no competing interests.

Author details: SK MD ABU IMAM SAADI (SMAIS) is an Assistant Professor at Aliah University in the Department of Biological Sciences. He is working on Plant DNA Barcode and Stress Tolerance Activity of Plant in different Environmental Conditions. MEHEBUB SARWAR HOSSAIN (MSH) is a research scholar at Aliah University in the Department of Biological Sciences. Currently working on the Molecular phylogeny of the genus Ocimum based on DNA barcodes. DEBASIS BHUNIA (DB) is an Assistant Professor at Sree Chaitanya College in the Department of Botany. Currently, he is working on the angiosperm diversity in the aquatic and marshy land of Paschim Medinipur district of West Bengal. SK. RASIDUL ISLAM (SRI), he just completed his Ph.D. from Vidyasagar University on Bryoflora of South West Bengal; SAYANTAN TRIPATHI (ST) has completed his Ph.D. from Vidyasagar University on Hemi-parasitic Flora of South West Bengal. SANJIT SINHA (SS) has completed his PhD from Vidyasagar University on the family Asclepiadaceae & AMAL KUMAR MONDAL (AKM) is a Professor at Vidyasagar University in the Department of Botany & Forestry. He completed his PhD from Visva-Bharati University. He has 35 years of research experience. He is working on taxonomy, bio-systematics and molecular taxonomy.

Author contributions: SMAIS: Design and writing the original draft; Supervision, field survey; MSH: Create the study Map; DB: Formal analysis; SRI & SMAIS: Laboratory studies; ST: Drawing and editing; SS: Assistance in the field survey and critical comments for the preparation of manuscript; AKM: Read and approved the final manuscript.

Acknowledgements: The authors are thankful to the Jhargram and Gopegarh Forest Department for facilitating the exploration of different forest areas. We also thank to the authority of Aliah University, New Town, Kolkata for their support and all the research scholars in the Plant Taxonomy Laboratory, Department of Botany and Forestry, Vidyasagar University, Midnapore. We are highly acknowledged to Bose Institute, Kolkata, India for providing SEM facilities.

INTRODUCTION

Tacca leontopetaloides (L.) Kuntze is commonly known as East Indian Arrowroot, is also called Polynesian Arrowroot, and was previously placed under the family Taccaceae (Dumortier 1829). Recently, Caddick et al. (2002) treated *Tacca* J.R.Forst. & G.Forst. into Dioscoreaceae (APG II 2003) because *Tacca* shares many characteristics with other plants in Dioscoreaceae, such as having tuberous underground parts rich in steroidal saponins, petiolate reticulate-veined leaves, and reflexed stamens. However, *Tacca* is distinctive because of its acaulescent habit and unilocular ovaries with parietal placentation. According to POWO (2024+), *T. leontopetaloides* has 32 synonyms. Among them, a few heterotypic synonyms are *Tacca pinnatifida* var. *brownie*. (Seem.) F.M.Bailey, *T. pinnatifida* ssp. *interrupta* Warb. ex H.Limpr., *T. pinnatifida* ssp. *involucrata* (Schumach. & Thonn.) H.Limpr., *T. pinnatifida* ssp. *madagascariensis* H.Limpr. *T. pinnatifida* f. *obtusata* Limpr., *T. pinnatifida* var. *paeoniifolia* Domin, *T. pinnatifida* var. *permagna* Domin, and *T. umbrarum* Jum. & H.Perrier (http://apps.kew.org/wcsp/home.do). The plant is generally growing in the open forest but is occasionally seen in the rainforests. The genus *Tacca* comprised of about 20 species distributed in the tropical region of Asia (Chua et al. 2020). According to Meena & Yadav (2010) and USDA (2021), it is native to tropical Africa, the Indian subcontinent, Papua New Guinea, Indonesia, Malaysia, Philippines, Australia, Micronesia, Fiji, and Samoa. So far, the genus is represented by six species, viz., *Tacca chantrieri* André, *T. pinnatifida* Forst., *T. cristata* Jack., *T. integrifolia* Ker-Gawl., *T. laevis* Roxb. and *T. leontopetaloides* (L.) Kuntze in India (Baruah et al. 2015 & Saadi et al. 2020). The plant is cultivated in India and regarded as an economic food crop. According to Kay (1987), Polynesian arrowroot tubers are eaten as food in northern Nigeria, particularly at the time of the scarcity of other staple foods. The tuber of this plant used as a staple food in place of rice and flour, which is one of the sources of carbohydrates. In order to combat famine and food insecurity, the high carbohydrate content of its starch—83.07–88.07%—is beneficial for south coast populations in West Java (Wardah & Ariani 2014, 2015, 2020). Many Polynesian islands also employ the bitter raw tuber as a medicinal remedy for stomach problems, primarily diarrhoea and dysentery, hepatitis, guinea worm infection, and snake bites (Kay 1987).

In 2015, present authors conducted an intensive floristic survey and were able to collect the plant for the first time from the sacred groves of the Chilkigarh forest in Jhargram District, West Bengal during the rainy season in fruiting stage. In May 2020, the species was collected again from the sacred groves of the Gopegarh forest in Paschim Medinipur, West Bengal even though they were not fruiting at that time. Lastly, in October 2023, present authors explored for the species in Patna and Ranchi districts of Bihar and Jharkhand, respectively. However, *T. leontopetaloides* was not seen anywhere. The study critically examines collected specimens based on the different literature (Prain 1903; Thaker et al. 1970; Rao & Verma 1976; Ling 1985; Lakshminarasimhan 1996; Samvatsar 1996; Zhang & Li 2008; Meena & Yadav 2010; Borokini et al. 2014; Baruah et al. 2015; Yeng & Shen 2019; Kalita et al. 2022). This paper aims to provide a detailed account of the species, for future reference and conservation purposes.

MATERIALS AND METHODS

Several field surveys were conducted from 2015–2023 to estimate the population of *Tacca leontopetaloides* from eastern India (Figure 1). This study covered both disturbed (plant communities affected by human activities or natural events, leading to a reduction in biodiversity) and undisturbed (plant communities unaffected by major natural disturbances or human activities leading to rich biodiversity and more stable ecosystems) patches of vegetation in several districts of Bihar, Odisha, Jharkhand, and West Bengal. Additionally, the authors examined existing literature to see if there were any reports of this species from eastern India. In a detailed literature study, it was found that *T. pinnatifida* Forst, which is a synonym for *T. leontopetaloides*, was initially documented by D. Prain in 1903 from the Chota Nagpur Plateau. This area is currently part of Jharkhand and the surrounding regions of Chhattisgarh, Odisha, West Bengal, and Bihar. The present authors visited multiple locations in Odisha, Bihar, and Jharkhand to study this species. In West Bengal, authors conducted visits to 19 districts on multiple occasions, but only encountered the species in two districts: Paschim Medinipur (Gopegarh) and Jhargram (Chilkigarh). The Chilkigarh is a village in Jhargram located on the banks of the Dulung River and is known for its rich biodiversity, covering an area of about 0.0040 km^2 between 22.446–22.455 N and 86.874–86.881 E. The average elevation of the area is 60–85 m above the mean sea level. Gopegarh is located within the deciduous natural forest, on the banks of the Kangsabati River, covering an area of about 0.0071 km^2 between 22.418–22.424 N and 87.281–

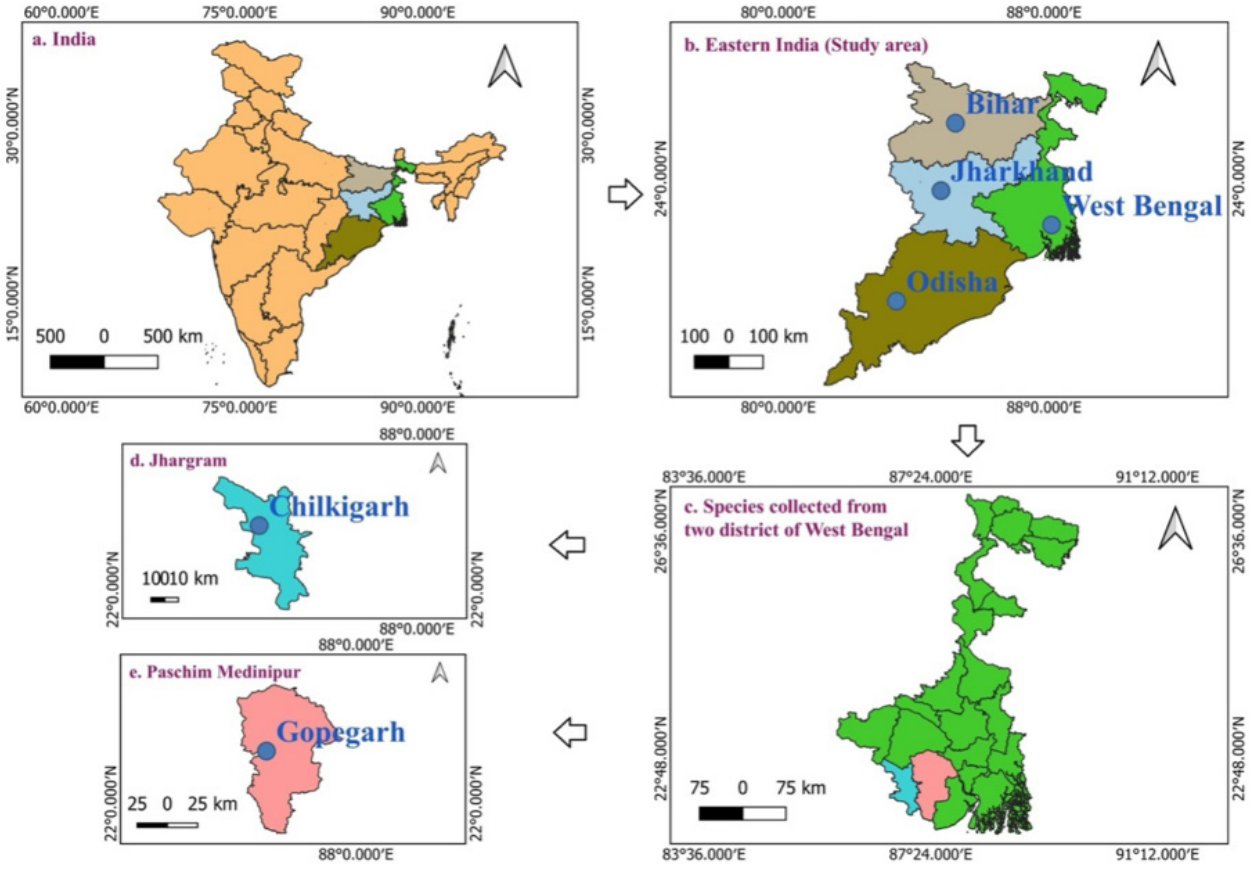

Figure 1. a—India | b—Eastern India | c—West Bengal | d—Jhargram |e—Paschim Medinipur. This figure shows the precise locations of collection sites from four states in Eastern India (the study area) as well as the collection areas of Gopegarh and Chilkigarh inside two districts of West Bengal (Map prepared using QGIS software).

87.277 E. The average elevation of the area is 55–86 m.

The collected specimens were processed to prepare voucher specimens and examined for detailed morphological study using a Carl Zeiss Stemi-508 microscope. For the pollen study, acetolyzed pollen (follows Erdtman 1960) grain was transferred to the SEM stubs, sputter-coated with gold for 2 minutes, and viewed under a Marlin scanning electron microscope (ZEISS FESEM SUPRA-40). Photographs of plant specimens and habitats were taken using a Nikon camera (Model-Z30). The herbarium specimens (00713 and 00722) were deposited at the Vidyasagar University Herbarium, West Bengal. The distribution status was determined by referring to 'Plants of the World Online' (POWO), relevant floras, and literature. To indicate the correct location of the study area, we prepared a map using QGIS 3.24.0 software.

RESULTS AND DISCUSSIONS

Taxonomic treatment

Tacca leontopetaloides (L.) Kuntze, Revis. Gen. Pl. 2: 704. 1891; Drenth in Blumea 20: 375.1972; Lakshminarsimhan in Sharma et al. (1996); Fl. Maharashtra State, Monocot 3:108. 1996; *Leontice leontopetaloides* L., Sp. Pl. 313. 1753; *Tacca pinnatifida* J.R.A.Forst., Char. Gen. 35: t. 35. 1776; Hook.F., Fl. Brit. India 6: 287. 1892; Cooke, Fl. Bombay 3:262. 1958 (Images 1 & 2).

It is an upright perennial herb with a dark brown, round or broadly ellipsoid-shaped tuber or Ovoid tuber several inches across (Flora of West Tropical Africa, Vol 3, Part 1), usually giving rise to one or two erect leaves 2–4 ft. high and an inflorescence 3–6 ft. high. On transverse section, the tuber is internally white, and it can measure 15–25 cm. in diameter. The plant has 1–3 large, radical leaves that are broadly obovate, ovate or oblong. The leaves are palmately 3-lobed and the lobes are pinnately lobed with undulate margins and reticulate veins.

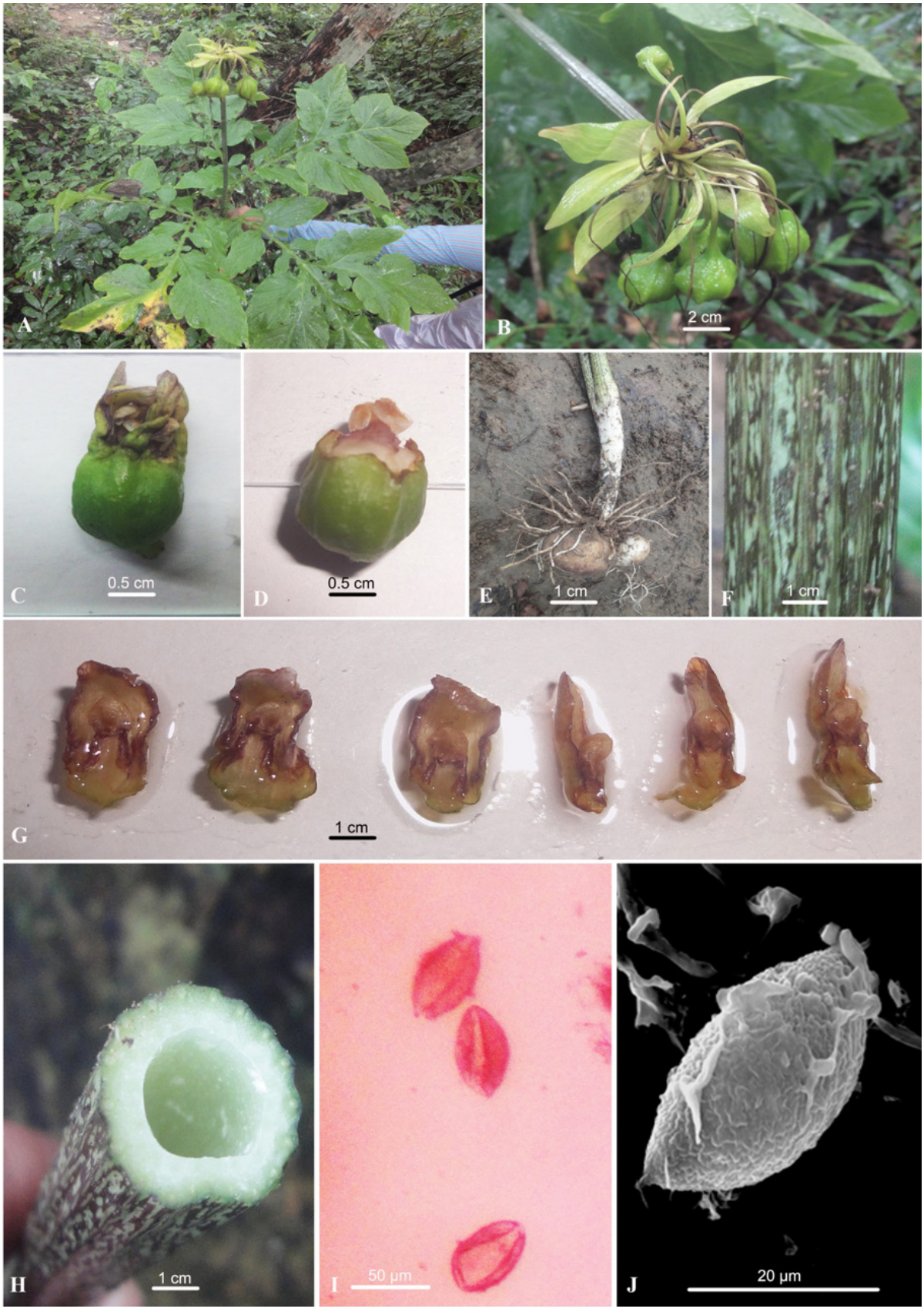

Image 1. ***Tacca leontopetaloides*** **(L.) Kuntze: A—Habit | B—Infructescence | C—Single flower | D—Carpel | E—Corm | F—Outer surface of stem | G—Dissected flower with androecium | H—Hollow stem | I—Pollen under light microscope | J—Pollen under SEM. _© SMAIS, SRI and SS.**

The petioles are 30–90 cm. long, hollow and striated. Scape is longer than the petiole and has 4–6 flowers at the apex of a long, leafless scape. Flowers are regular, bisexual and pedicellate. Bracts 6–12 in number, oblong-lanceolate that are recurved and striped with purple. It also has numerous filiform bracteoles that are longer than the bracts. Perianth is usually lurid, campanulate and 6-lobed. Stamens 6, adnate to the perianth tube or the base of the perianth lobes. Anthers have two ribs on the inner face, and the dehiscence is longitudinal. Carpels 3, connate in an inferior ovary, and many anatropous ovules. Style short, columnar and usually 3, cohered. Stigmas 3, petaloid and broad. Fruits globose or ovoid, indehiscent berries, many-seeded, seeds ovoid to ellipsoid, angular, and longitudinally striate.

Pollen character: Polar Axis (P)-17 (19.6) 26 µm; equatorial diameter (E)- 32 (35.75) 41 µm; P/E- 0.55 µm; exine thickness-2 µm; pollen shape-oblet to spheroidal; aperture type- monosulcate; aperture size-11 (16.53) 19 µm (Image 1I, 1J).

Vernacular names: English: Polynesian Arrowroot, East Indian Arrowroot, Bat Flower, Devil's Whiskers; Hindi: Ajeenamoti; Malayalam: Puliyar; Tamil: Kasippu; Bengali: Talmul

Phenology

Tacca leontopetaloides is known for its unique and conspicuous inflorescence that resembles bat's wing. The flowering and fruiting period may vary depending on the specific region and environmental conditions. This plant reproduces by two methods: sexually, through the production of flowers and seeds, and vegetatively, via rhizomes. The flowers are unique and quite distinct, and they may offer nectar to pollinators. It is typically found during the rainy season from April to October. However, it remains active throughout the year and dormant throughout the dry season from November to February. In India, the flowering and fruiting occur from July to October.

Distribution and Ecology

According to POWO (2024), *Tacca leontopetaloides* is reported from 80 out of 195 countries Worldwide. In India, it is reported from 13 out of 28 states and eight union territories according to the various sources (Prain 1903; Rao & Verma 1976; Lakshminarasimhan 1996; Samvatsar 1996; Meena & Yadav 2010; Saadi et al. 2020). This plant is usually found in forests, in damp and shady areas, and was found to be associated with some other trees like *Strychnosnux-vomica* L., *Adina cordifolia* (Roxb.) Hook.f., *Shorea robusta* Roth., *Tectona grandis* L.f., *Terminalia bellerica* (Gaertn.) Roxb., *Terminalia arjuna* (Roxb.) Wight & Arn., *Anacardium occidentale* L., *Madhuca longifolia* (J.Konig) J.F.Macbr., Brandis as well as lianas like *Bauhinia vahlii* Wight & Arn., *Ichnocarpus frutescens* R.Br and *Ziziphus mauritiana* Lam. along with some herbs like *Typhonium trilobatum* (L.) Schott., *Curculigo orchioides* Gaertn., *Amorphophallus bulbifer* (Roxb.) Blume, *Dioscorea bulbifera* L., *Oplismenus burmannii* (Retz.) P.Beauv., *Clerodendrum infortunatum* L., *Flacourtia indica* (Burm.f.) Merr., *Mesosphaerum suaveolens* (L.) Kuntze, *Chromolaena odorata* (L.) R.M.King & H.Rob., *Lippia alba* (Mill.) N.E.Br. ex Britton & P.Wilson.

Specimens examined

India, West Bengal**,** Chilkigarh forest, Jhargram district, 22.vi.2015, coll. Saadi et al., #00713; Same locality., 20.vi.2016, coll. Saadi & Sinha, #00722. Gopegarh, Paschim Medinipur district, 20.v.2019, coll. Saadi & Mondal, #00803 (all vouchers are deposited at Vidyasagar University Herbarium).

Economical and medicinal importance of *Tacca leontopetaloides*

The economic importance of Polynesian Arrowroot is not reflected in official statistics. However, research reports indicate that it is important at the local level as a reserve and ceremonial food. Interestingly, it can produce edible starch on marginal soils. According to (Olojede et al. 2009) a measure of the prepared starch weighing approximately 1 kg was sold between N100 (USD 0.78) and N120 (USD 0.94) back in 2009. It is a beloved food among many communities in the southern parts of Plateau State, as noted in a study by Ogbonna et al. (2017). The starch from this food is dried and used to prepare various types of puddings, porridge, and ceremonial foods among the Tiv people of north-central Nigeria, as reported by Ahemen & Raji (2008) and Amadi et al. (2018). In India, *T. leontopetaloides* tubers are usually cooked, and boiled with leaves of guava or tamarind to avoid the irritating properties of the tubers, or roasted as vegetables (Misra & Misra 2014).

The medicinal properties of different parts of *Tacca leontopetaloides*, such as roots and tubers, are used to treat various ailments. Specifically, bitter raw tubers are traditionally used to treat stomach ailments such as diarrhoea and dysentery (Kay 1987). Both the raw tubers and starch have been used to treat vomiting and diarrhoea in traditional Hawaiian communities (Krauss 1998). According to (Bosha et al. 2015), the traditional rulers have historically used it for their rituals and as an

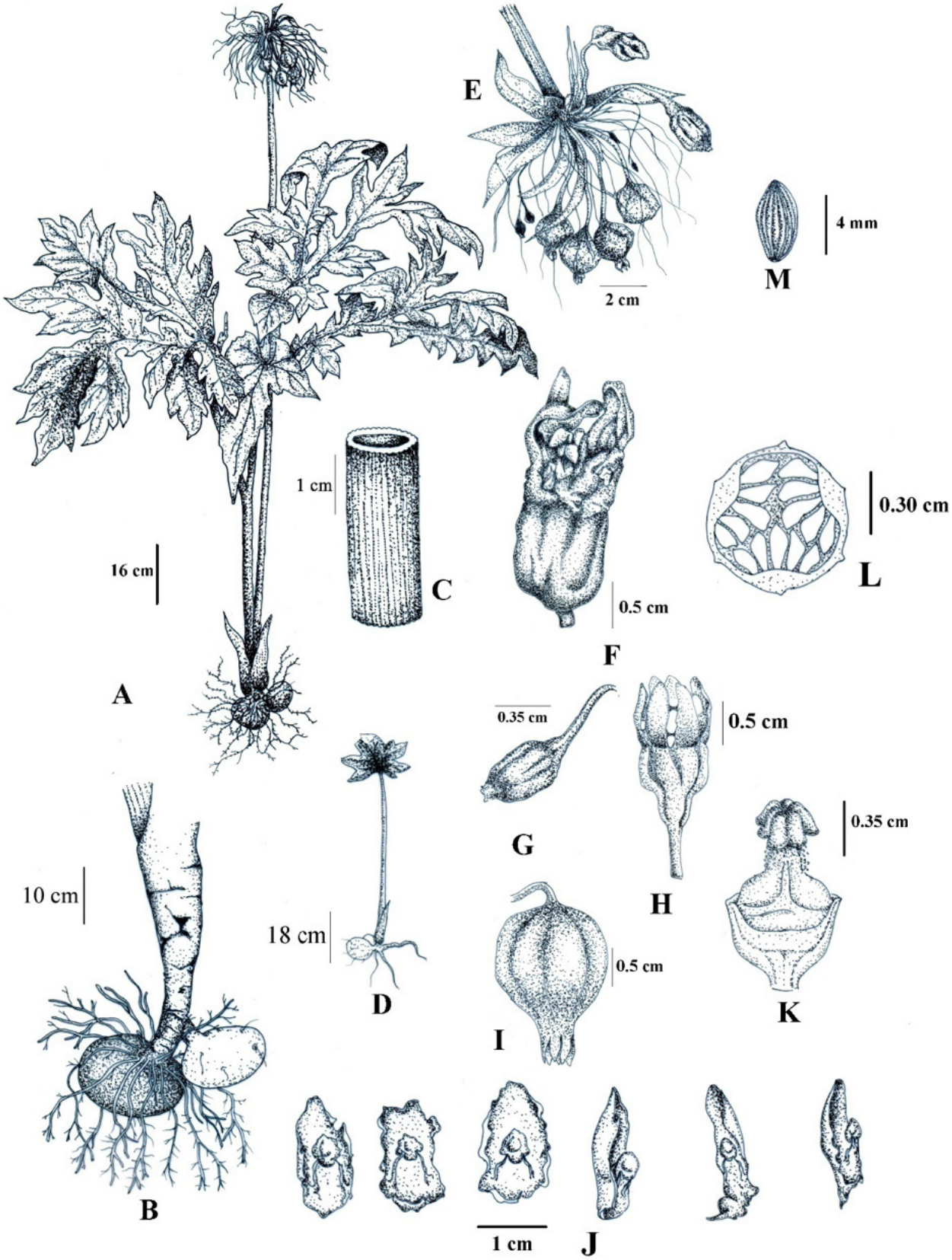

Figure 2. ***Tacca leontopetaloides*** **(L.) Kuntze: A—Flowering plant | B—Corn | C—Hallow Stem | D—Seedling plant | E—Infructescence | F—Single flower | G-H—Flower bud | I—Fruit | J—Dissected flower with androecium | K—Gynoecium | L—T.S of ovary | M—Seed. © SMAIS, SRI and SS.**

aphrodisiac. Additionally, the root starch is used to stiffen fabrics in some of the islands, as stated by (Ukpabi et al. 2009). Recently, it has been discovered that the marc of *Tacca* has antidiabetic effects, as mentioned by (Bosha et al. 2013). The rhizome possesses detoxifying, anti-inflammatory, and analgesic properties, and can cure abscesses in the stomach and duodenum, high blood pressure, hepatitis, gastralgia, burns, and ulcers (Zhang et al. 2007). During the present survey, we frequently inquire with local people about the ethnomedicinal uses. However, they only utilize tubers to treat piles, diarrhoea, and dysentery. Studies have shown that over 134 compounds with different bioactivities have been isolated from *Tacca* species including steroids, terpenoids, diaryheptanoids and taccalonolidesare said to have the potential to become anti-cancer drugs (Abdallah et al. 1990; Tinley et al. 2003).

Conservation status

After conducting a comprehensive survey of various locations in eastern India, we observed only four mature plants from Gopegarh forest, and 18 mature plants were found to spread across 60 acres in the Chilkigarh forest. Based on our present findings, it is evident that there are not many individuals of the species though, the species is globally 'Least Concern' (LC) (Contu 2013). Unfortunately, their numbers are declining due to land use changes, increased tourism, natural calamities, and overharvesting resulting. Conservation planning is essential to mitigate the impact of increasing human population and declining species, such as: (1) Select the regions where we want to conserve the species; (2) Restore damaged habitats by preventing human activity, eliminating invasive species, reducing erosion, preventing agricultural expansion and implementing sustainable management practices; (3) Reintroduce the plant species into their natural habitats by moving individual plants or seeds to establish or strengthen new populations where they have become locally rare; (4) Encourage the local people to cultivate *T. leontopetaloides* due to its economic and medicinal importance, as well as its high starch content (amylose and amylopectin) similar to that of a potato; and (5) Involve local communities, indigenous peoples, and stakeholders in conservation efforts. This includes empowering communities to manage natural resources sustainably, respecting traditional knowledge, and promoting livelihoods that are compatible with plant conservation.

REFERENCES

Abdallah, M.E., A. Aziz., K.R. Brain, G. Blunden, T. Crabb & A.K. Bashir (1990). Steroidal Sapogenins from *Tacca leontopetaloides*. *Planta Medica* 56(2): 218–221. https://doi.org/10.1055/s-2006-960929

Ahemen, S.A. & A.O. Raji (2008). Development and performance evaluation of a motorized rasping machine for *Tacca involucrata*. *Journal of Agricultural Engineering Technology* 16(1): 52–63.

Amadi, C.O., C.N. Ebeniro, A.G. Ironkwe, C.C. Nwokocha & G. Amadi (2018). Description of some morphological attributes of Polynesian Arrowroot from Benue State, Nigeria. *Nigerian Journal of Botany* 34(2): 289–298.

Angiosperm Phylogeny Group II (2003). An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG II. *Botanical Journal of the Linnean Society* 141(4): 399–436. https://doi.org/10.1046/j.1095-8339.2003.t01-1-00158.x

Baruah, S., J. Sarma & S.K. Brothakur (2015). *Tacca chantrieri* André (Taccaceae): A beautiful ornamental flora recorded as a new for India. *An International Journal of Environment and Biodiversity* 6(1): 18–20.

Borokini, T.I., A.E. Ayodele & A.J. Akinloye (2014). Morphological and anatomical studies on *Tacca leontopetaloides* (L.) Kuntze (Taccaceae) in Nigeria. *Research in Plant Biology* 4(5): 28–44.

Bosha, J.A., F.A. Gberinder & I.U. Asuzu (2013). Antihhyperglyceanic Effect of *Tacca involucrata* on Alloxan Induced Diebetic Rats. *Ghana Biomedical Convention, Cape Coast* 56.

Bosha, J.A, A.O. Anaga & I.U. Asuzu (2015). Chemical Composition of the Marc of a Wild Tropical Plant *Tacca involucrata* (Schumach and Thonn, 1827). *Food and Nutrition Sciences* 6(1): 135–140. https://doi.org/10.4236/fns.2015.61014

Caddick, L.R., P.J. Rudall, P. Wilkin, T.A.J. Hedderson & M.W. Chase (2002). Phylogenetics of Dioscoreales based on combined analyses of morphological and molecular data. *Botanical Journal of the Linnean Society* 138(2): 123–144. https://doi.org/10.1046/j.1095-8339.2002.138002123.x

Chua, K.S., A. Borkent & S.Y. Wong (2020). Floral biology and pollination strategy of seven *Tacca* species (Taccaceae). *Nordic Journal of Botany* 38(2): NJB-02594. https://doi.org/10.1111/njb.02594

Contu, S. (2013). *Tacca leontopetaloides*. *The IUCN Red List of Threatened Species*: e. T44392847A44503085. https://doi.org/10.2305/IUCN.UK.20132.RLTS.T44392847A44503085.en. Accessed on 12 September 2024.

Dumortier, B.C.J. (1829). *Analyse des familles des plantes, avec l'indication des principaux genres qui s'y rattachent Tournay: J.* Casterman aine.

Erdtman, G. (1960). The acetolysis method – a revised description. *Svensk Botanisk Tidskrift* 39: 561–564.

Kalita, N., K.K. Das, S. Mehmud, H. Roy & D. Sahariah (2022). Distribution of *Tacca chantrieri* (Taccaceae) in Assam, India. *Biological Spectrum*. EBH Publishers, Panbazar, Guwahati, India, 19 pp.

Kay, D. (1987). *Root Crops. 2nd edition.* In: Gooding, E.G.B. (ed.). Tropical Development and Research Institute, United Kingdom, 380 pp.

Krauss, B.H. (1998). Native Plants are used as Medicine in Hawaii. Retrieved from: https://uhawaii-kauai.primo.exlibrisgroup.com/discovery/fulldisplay?docid=alma9919255224605693&context=L&vid=01UHAWAII_KAUAI:KAUAI&lang=en&search_scope=DN_and_CI&adaptor=Local%20Search%20Engine&isFrbr=true&tab=Everything&query=any,contains,Native%20Plants%20are%20used%20as%20Medicine%20in%20Hawaii&offset=0

Lakshminarasimhan, P. (1996). Monocotyledones. In: Karthikeyan, S. & N.P. Singh (eds.). *Flora of Maharashtra State*. Botanical Survey of India, Calcutta, 794 pp.

Ling, P.P. (1985). Taccaceae. In: Chien, P. & T. Chih-Tsun (eds.). *Flora of Reipublica Popularis Sinica* 16: 42–54.

Meena, K. & B. Yadav (2010). *Tacca leontopetaloides* (Linn.) O. Kuntze (Taccaceae) – A new record to the flora of Rajasthan. *Indian Journal*

of Natural Products and Resources 1(4): 512–514.

Misra, S. & M.K. Misra (2014). Original Article Ethno-botanical study of plants with edible underground parts of south Odisha, India. *International Journal of Agricultural and Food Science* 4(2): 51–58.

Ogbonna, A.I., S.O. Adepoju, C.I.C, Ogbonna, T. Yakubu, J.U. Itelima & V.Y. Dajin (2017). Root tuber of *Tacca leontopetaloides* L. (kunze) for food and nutritional security. *Microbiology: Current Research* 1(1): 7–13.

Olojede, A.O., A.O. Akinpelu, T.Y. Dalyop, D. Lenka, P. Iluebbey & A.G.O. Dixon (2009). Survey of Production, Utilization and Proximate Composition of Some Minor Root and Tuber Crops in Nigeria. *Nigerian Agricultural Journal* 40(1): 125–131.

POWO (2024). Plant of the World online. Facilitated by the Royal Botanical Gardens, Kew. *Tacca leontopetaloides* (L.) Kuntze https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names: 827910-1. Accessed on 12 September 2024.

Prain, D. (1903) (rep. ed. 1963). Bengal Plants. Vols.1–2. Botanical Survey of India. Calcutta, India 1314 pp.

Rao, A.S. & D.M. Verma (1976). Material towards a Monocot Flora of Assam-III (Taccaceae, Dioscoriaceae and Stemonaceae). *Ibid* 15: 189–203. https://doi.org/10.20324/nelumbo/v15/1973/75162

Saadi, S.M.A.I., I. Mondal, S. Sarkar & A.K. Mondal (2020). Medicinal plants diversity modelling using remote sensing & GIS technology of Chilkigarh, West Bengal, India. *Tropical Plant Research* 7(2): 440–451. https://doi.org/10.22271/tpr.2020.v7.i2.052

Samvatsar, S. (1996). The Flora of Western tribal Madhya Pradesh. Scientific Publishers, Jodhpur 441 pp.

Thaker, D.N., S.D. Sabnis & S.J. Bedi (1970). A contribution to the flora and vegetation of Kawat Range, Gujarat state, India. *Bulletin of the Botanical Survey of India* 12(1–4): 113–127.

Tinley, T.L., D.A. Randall-Hlubek, R.M. Leal, E.M. Jackson, J.W. Cessac, J.C. Quada, S.L. Mooberry (2003). Taccalonolides E and A: Plant-derived Steroids with Microtubule stabilizing activity. *Cancer Res* 63(12): 3211–20.

Ukpabi, U.J., E. Ukenye & A.O. Olojede (2009). Raw- Material Potentials of Nigerian Wild Polynesian Arrowroot (Tacca leontopetaloides) Tubers and Starch. *Journal of Food Technology* 7(4): 135–138.

USDA (2021). USDA Agricultural Research Service, National Plant Germplasm System. Germplasm Resources Information Network (GRIN Taxonomy). National Germplasm Resources Laboratory, Belts Tangden ville, Maryland. URL: https://npgsweb.ars-grin.gov/gringlobal/taxon/taxonomydetail?id=70775.

Wardah, W. & D. Ariani (2020). Ethnobotany study of Jalawure (Tacca leontopetaloides) as a source of nutrition quality improvement on the South Coastal people in West Java. *IOP Conference Series: Earth and Environmental Science* 458(1): 012047. https://doi.org/10.1088/1755-1315/458/1/012047

Wardah, W. & D. Ariani (2014). Proceedings of the 5th ASIAHORCs International Symposium (Bali) (Jakarta, Indonesia: LIPI).

Wardah, W. & D. Ariani (2015). Prosiding Seminar Nasional Sinergi Pangan, Pakan dan Energi Terbarukan (Yogyakarta) (Jakarta, Indonesia: Balai Pengembangan Proses dan Teknologi Kimia-LIPI).

Yeng, W.S. & C.K. Shen (2019). Phylogeny of Tacca (Taccaceae) and traits in reproductive structures, with description of a new Bornean species. *Biodiversitas Journal of Biological Diversity* 20(11): 3096–3118. https://doi.org/10.13057/biodiv/d201102

Zhang, L., J. Chen, D.Z. Li & Q.J. Li (2007). Reproductive Biology, Mating System, and Population Genetics of Devil Flower: An Autonomous Selfing Plant with Showy Floral Display. *Reproductive Biology* 1(2): 115–124.

Zhang, L. & Q.J. Li (2008). Tacca ampliplacenta (Taccaceae), a new species from Yunnan, China. *Annales Botanici Fennici* 45(4): 311–314. https://doi.org/10.5735/085.045.0412

Journal of Threatened Taxa is indexed/abstracted in Bibliography of Systematic Mycology, Biological Abstracts, BIOSIS Previews, CAB Abstracts, EBSCO, Google Scholar, Index Copernicus, Index Fungorum, JournalSeek, National Academy of Agricultural Sciences, NewJour, OCLC WorldCat, SCOPUS, Stanford University Libraries, Virtual Library of Biology, Zoological Records.

NAAS rating (India) 5.64

Print copies of the Journal are available at cost. Write to:
The Managing Editor, JoTT,
c/o Wildlife Information Liaison Development Society,
3A2 Varadarajulu Nagar, FCI Road, Ganapathy, Coimbatore,
Tamil Nadu 641006, India
ravi@threatenedtaxa.org & ravi@zooreach.org

Journal of Threatened Taxa

www.threatenedtaxa.org

ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

April 2025 | Vol. 17 | No. 4 | Pages: 26763–26938
Date of Publication: 26 April 2025 (Online & Print)
DOI: 10.11609/jott.2025.17.4.26763-26938

Articles

Communications

Short Communications

Notes

Publisher & Host

WILD zoo reach
Zoo Outreach Organisation

Threatened Taxa