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# Aroids of Andhra Pradesh, India

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#### **Abstract**

Aroids belong to the family Araceae. Aroids are attractive but perilous, edible but itchy some, highly nutritive but loathsome. Aroids are included with amazing *Alocasia* and *Aglaonema*, colourful *Caladium*, dumbcane *Diffenbachia*, culinary *Colocasia* (edible eddoes and itchy Taro), elephant foot yam *Amorphophallus*, wonderful water cabbage, spiny *Lasia*, lucky plant *Pothos*, evergreen *Epipremnum*, splendid *Syngonium*, typical *Typhonium* and giant *Xanthosoma*. Most aroids are important for food and fascination. Aroids play significant role in horticulture because of their foliage attraction; they are feast for the eyes. No need to gloom for bloom, bloom may fall by evening but foliage attraction ever fades. Besides beauty they play key role in food technology as vegetables and flour, fodder, fish feed, as they possess nutritive values and medicinal properties. Araceae is the most complicated family among monocots because it has enormous diversity in habit, habitat, leaves and flowers.

The present paper focuses on exploring of aroids and duck weeds in Eastern Ghats of Andhra Pradesh. Key and photographs will be provided for easy identification.

Keywords: Andhra Pradesh, Araceae, aroids, eastern ghats, edible, ornamentals, medicinal plants

### Introduction

### Araceae

The Araceae family is considered one of the most complex among monocots due to its remarkable diversity in both habit and habitat. Hydrophytic members range from free-floating and submerged forms to those thriving in marshy environments. Terrestrial members include geophytes, herbs, shrubs, epiphytes, and climbers. This family exhibits a wide range of growth forms, from small herbs to large shrubs and vigorous climbers. Morphological diversity is evident in nearly every part of the plant-including roots, stems, leaves, and inflorescences-making araceae uniquely varied and botanically significant.

The word 'arum' is derived from Greek word 'Aron', which means 'mountaineer' or 'mount of strength'. This etymology is fitting, as many aroid species are commonly found thriving in hilly and mountainous regions.

The Araceae is a family of herbaceous monocotyledons comprising approximately 144 genera and about 4,075 species according to POWO (2025), including those formerly placed under Lemnaceae. Within India, the family is represented by 32 genera and 228 species, as documented by Sasikala *et al.* (2019). In earlier taxonomic accounts, Gamble (1935) listed only 18 genera and 42 species, indicating a considerable expansion in floristic knowledge over time. From the state of Andhra Pradesh, T. Pullaiah (2018) [18] previously reported 11 genera and 41 species, signifying a modest yet noteworthy share of the national diversity. In the present study, a total of 28 genera and 56 species have been recorded, following Bentham and Hooker's classification system, thereby contributing updated insights into the regional diversity and distribution of the family.

### Diversity in Aroids Root System

In the Araceae family, adventitious roots are commonly found in all terrestrial species. Some genera exhibit specialized root types adapted to their growth habits and environments. Contractile roots are seen in *Amorphophallus* and *Typhonium* species, helping in anchorage and depth adjustment. Nest roots occur in *Anthurium*, aiding in collecting organic debris and moisture. Anchor or feeder roots are typical in *Philodendron*, supporting the plant and absorbing nutrients.

Corresponding Author: Prameela Rapaka Government Degree College for Men, Srikakulam, Andhra Pradesh, India Climbing roots are found in *Pothos*, Clinging roots are in *Monstera*, *Epipremnum* and *Syngonium* enabling the plant to attach and ascend surfaces. Balancing roots appear in *Pistia*, helping maintain buoyancy and stability in water.

### Stem

The stem in Araceae exhibits considerable variation and can be either underground or aerial. Underground stems may be corms (as seen in *Amorphophallus*, *Arisaema* and *Typhonium*) or rhizomes (as in *Aglaonema*, *Alocasia*, and *Dieffenbachia*). Aerial stems can be erect or weak, with some species developing stoloniferous stems for vegetative propagation. Many members, especially epiphytes and climbers such as *Philodendron*, *Pothos*, *Syngonium*, and *Monstera*, exhibit modified aerial stems adapted for climbing and support.

### Leaf

Leaves in the Araceae family display remarkable morphological variation, tiny to giant size. They are typically simple, but may be entire, palmately lobed, or pinnately lobed. Palmately lobed leaves can take various forms such as: Sagittate (*Xanthosoma*), Hastate (*Typhonium*), Trifid and pedatifid, Pinnatifid (*Raphidophora*), Pedatisect (*Arisaema*, *Syngonium*). Pinnatisect and radiatisect types. Pinnate leaves may be linear, show heteroblasty, or have perforations as seen in *Monstera*. Peltate leaves are characteristic of *Colocasia*. Heterophylly is common in many species, where juvenile leaves are usually simple, while mature leaves develop into more complex and distinctive shapes.

### **Inflorescence**

The inflorescence in araceae is typically a simple spadix, usually subtended by a spathe (no spathe in Acorus calamus). have both plants cataphylls(bract) Prophylls(bracteoles) For example Colocasia and Xanthosoma. However, there is considerable diversity in both spathe morphology and flower arrangement on the spadix. The spathe may be present or absent (Calamus), free from the spadix (as in Anthurium), Spathe seperated into a tube with a spathe blade (e.g., Xanthosoma, Colocasia), or entire (Aglaonema, Spathiphyllum) spathe blade persistent (Philodendron, Epipremnum) or deciduous after anthesis (Colocasia, Xanthosoma). Spathe morphologically varied: open (Typhonium), boat-shaped (Syngonium), or elongated into a whip-like tip (Arisaema). The spadix is often differentiated into distinct zones: Stipe, female zone, sterile zone, Male zone and appendix, some species lack an appendix altogether.

# Flower sexuality also varies

Perianth present in perigoniate flowers or bisexual flowers found in Acorus. Anthurium, Epipremnum, Spathiphyllum. Perianth absent in unisexual flowers (Alocasia, Colocasia, Typhonium, and Xanthosoma). Male flowers: filament flattened, short or absent, anthers formed in synandria, porous anthers, abundant pollen release by apical pores in thread like form. Female flowers: Ovaries range from monocarpellary to pentacarpellary, single or multi ovules, placentation basal (Typhonium, Amorphophallus) or parietal (Pistia, Xanthosoma), style present or absent; stigma discoid or lobed; Sterile flowers: discoid or filiform; appendix present or absent

**Pollination:** Entamophily.

Fruit: Berry.

**Pests and diseases:** Major pests are Caterpillars, Insects (Aphids, Colocasiomyia, Pseudococcus longispinus) and Snails and some microbial diseases.

### **Economic Importance**

The strength of the araceae is colourful and beautiful attractive foliage ornamental plants, up to 50% aroids are using in horticulture as an ornamental plant, valued not only for their beauty but also for their ability to refresh the air, uplift the soul, and provide many subtle, often unnoticed benefits. Besides beauty, aroids hold significant value in food and medicine. Their leaves and tubers serve as nutritious food sources for humans and other living beings (Taros, Eddoes, Cocoyams, Elephant foot yams). Moreover, several aroid species have been traditionally used in curing diseases, and play great role in medical world. For example Acorus calamus is used to treat digestive disorders, dumbness and strongly believed in relieved from evil spirits. Acorus calamus is traditionally used to treat digestive disorders and speech difficulties. It is also widely believed to possess properties that drive off evil spirits. Arisaema tortuosum, Epipremnum Syngonium podophyllum, pinnatum, Lasia spinosa, Typhonium divaricatum and Xanthosoma species are some of the important medicinal plants.

### **Study Area**

Andhra Pradesh, located along the southeastern coast of India, is one of the country's most ecologically diverse states. Its geographical extent, varied topography, and climatic conditions contribute to a broad spectrum of habitats. This environmental diversity supports a rich assemblage of flora and fauna, making the state an important region for botanical exploration and documentation.

The vegetation of Andhra Pradesh exhibits notable variation, ranging from tropical moist and dry deciduous forests to thorny scrublands, mangrove ecosystems, grasslands, and agricultural landscapes. In the coastal districts, mangrove vegetation is prominent, particularly in the Godavari and Krishna deltas, while aquatic and semi-aquatic vegetation thrives in freshwater and marshy environments.

Based on Champion and Seth's (1968) forest classification, the forests of Andhra Pradesh can be categorized into Southern Tropical Moist Deciduous Forests, Southern Tropical Dry Deciduous Forests, Southern Tropical Thorn Forests, and Tidal Swamp/Mangrove Forests, along with riverine forests that occur along the banks of major rivers. These forest types play a crucial role in supporting a range of plant families, including shade-loving and moisture-dependent taxa such as the Araceae.

The state is traversed by several significant hill ranges, primarily the Eastern Ghats, which extend across major districts. Notable hill systems include the Nallamala, Seshachalam, Erramala, Lankamala, and Papi Hills (Papi Kondalu). These hilly and elevated regions exhibit cooler microclimates, higher humidity, and shaded understories, forming suitable niches for various endemic, epiphytic, and herbaceous plant species. The hill-top vegetation of Andhra Pradesh is largely influenced by the Eastern Ghats, which traverse the state from north to south, creating a series of elevated plateaus, ridges, and valleys. Prominent hill ranges such as the Nallamala, Seshachalam, Erramala, Lankamala, and Papi Hills (Papi Kondalu) exhibit a wide range of altitudinal and microclimatic variations that shape their

vegetation patterns. The hill summits and upper slopes are generally characterized by tropical dry deciduous to moist deciduous forests, with occasional patches of scrub or savanna-like vegetation on exposed rocky plateaus. In regions with deeper soils and higher rainfall, particularly in the Eastern Ghats and Seshachalam ranges, dense stands of moist deciduous forest species such as *Terminalia*, *Pterocarpus*, *Tectona*, and *Shorea* can be found.

The hill-tops and shaded valleys also harbour a rich diversity of herbaceous and shade-loving plants, including aroids, ferns and orchids, which thrive under the humid and partially shaded conditions. In certain rocky hilltops, xerophytic and lithophytic species are common, adapted to survive in shallow soils and high light intensity. These highland ecosystems serve as important centres of endemism and ecological diversity, providing refuge for many rare and threatened taxa. The variation in altitude, soil depth, exposure, and moisture across the hill systems of Andhra Pradesh contributes significantly to the overall floristic richness of the state.

Andhra Pradesh is well-endowed with an extensive river network, which includes major rivers such as the Godavari, Krishna, Penna (Penneru), Vamsadhara, Nagavali, and Tungabhadra. In addition to these perennial river systems, the state encompasses numerous lakes, reservoirs, ponds, marshlands, backwaters, and estuaries, which support hydrophytic and marshy vegetation. Prominent wetland systems include Kolleru Lake, one of Asia's largest freshwater lakes, and Pulicat Lake, a major brackish water lagoon shared with Tamil Nadu. Aquatic vegetation in Andhra Pradesh plays a significant role in maintaining the ecological balance of its freshwater and brackish water ecosystems. The state is endowed with an extensive network of rivers, lakes, reservoirs, ponds, marshlands, canals, and estuaries, which support a rich diversity of hydrophytic and semi-aquatic plant species. Major freshwater bodies such as Kolleru Lake, one of the largest freshwater lakes in Asia, and reservoirs formed along the Godavari, Krishna, and Penna river systems, provide suitable habitats for floating, submerged, and emergent types of aquatic plants. Additionally, Pulicat Lake, a major brackish water lagoon shared with Tamil Nadu, supports halophytic and salt-tolerant hydrophytes. Wetland areas, paddy fields, irrigation tanks,

and seasonal marshes also foster diverse aquatic flora. These ecosystems often harbor genera such as *Eichhornia, Pistia, Lemna, Hydrilla, Vallisneria*, and *Nymphaea*, along with semi-aquatic taxa belonging to families like Araceae, Cyperaceae, and Poaceae. Thus, the aquatic vegetation of Andhra Pradesh forms an integral component of its floristic diversity and provides habitats for numerous plant, fish, and avian species.

The state exhibits a variety of soil types, influenced by geological and climatic factors. Major soil categories include red loamy soils (Alfisols) in upland areas, black cotton soils (Vertisols) predominating in Rayalaseema, alluvial soils along the river basins, lateritic soils in hill tracts, and sandy coastal soils along the shoreline. These varied soil conditions support distinct plant communities and influence species diversity across regions.

# **Collection of Specimens**

Plants are collected from different places and seasons to study their features. Some are dried and pressed to make herbaria. Thick or fleshy parts are preserved in chemicals as they spoil quickly. These preserved specimens help in plant identification, research, and learning about plant diversity and their natural habitats.

# **Results and Discussion**

The present study records 28 genera and 56 species, following Bentham and Hooker's classification system. Most of the aroids documented are ornamental and edible plants, few are medicinal plants. Details on the 28 genera, 56 species, along with their habitat, habit, and uses, are presented in Table 1. Preparing aroids safely for consumption. Some aroid species, like taro (Colocasia esculenta) and elephant foot yam (Amorphophallus paeoniifolius), are important food crops globally. The toxicity can be eliminated by proper preparation methods. Cook thoroughly: Boiling, baking, or roasting aroids completely denatures the calcium oxalate crystals, making them safe to eat. Use acidic ingredients: In some cultures, acidic ingredients like tamarind or lime are added during cooking to help neutralize the irritants. Discard the cooking water: The oxalates are drawn out into the cooking water, which should be discarded.

**Table 1:** Checklist of Selected Plant Species, Including Habitat, Habit, and Uses (or Taxonomic Inventory of Selected Plant Species with Ecological and Economic Uses)

S. No.	Genera	Species	Habitat	Habit	Use
1	1.Acorus (1)	A. calamus	Wetland	Herb	Medicinal
2	2. Aglaonema (3)	A. commutatum	Mesophyte	Herb	Ornamental
3		A. costatum	Mesophyte	Herb	Ornamental
4		A. discolor	Mesophyte	Herb	Ornamental
5	3. Alocasia (7)	A. amazonica	Mesophyte	Herb	Ornamental
6		A. cucullata	Mesophyte	Herb	Ornamental
7		A. decipens	Mesophyte	Herb	Ornamental
8		A. forniculata	Mesophyte	Herb	Ornamental
9		A. indica	Mesophyte	Herb	Edible
10		A. montana	Mesophyte	Herb	Ornamental
11		A. regina	Mesophyte	Herb	Ornamental
12	4. Amorphophallus (4)	A. campanulatus	Mesophyte	Herb	Edible
13		A. bulbifer	Mesophyte	Herb	Wild
14		A. paeoniifolius	Mesophyte	Herb	Edible
15		A. sylvaticus	Mesophyte	Herb	Wild
16	5. Arisaema	A. leschenaultii	Mesophyte	Herb	Medicinal
17		A. tortuosum	Mesophyte	Herb	Medicinal
18	6. Caladium	C. bicolor	Mesophyte	Herb	Ornamental
19		C. humboldtii	Mesophyte	Herb	Ornamental
20	7. Colocasia	C. esculenta	"	Herb	Edible

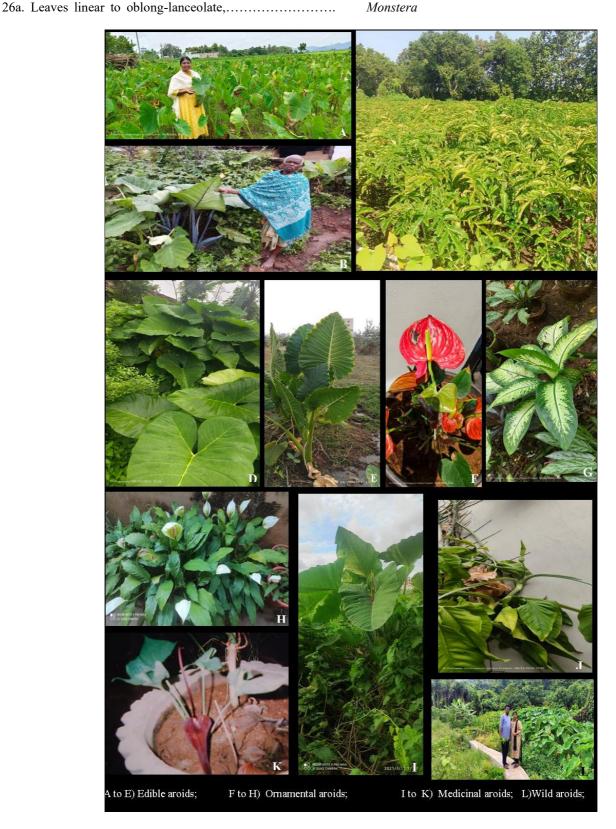
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21	8. Cryptocoryne	C. retrospiralis	Hydrophyte	Herb	wild
22	9. Dieffenbachia	D. amoena	Mesophyte	Herb	Ornamental
23		D. maculata	Mesophyte	Herb	Ornamental
24	10. Epipremnum,	E. aurius	Mesophyte	Climber	Ornamental
25		E. pinnatum	Mesophyte	Climber	Ornamental & Medicinal
26	11. Homalomena	H. wallisii	Mesophyte	Herb	Medicinal
27	12. Lasia,	L. spinosa	Marsh plant	Herb	Medicinal
28	13. Monstera	M. epipremnoides	Mesophyte	Climber	Edible
29	14. Nephthytis	N. wendlandii	Runner	Herb	Ornamental
30	15. Philodendron	P. erubescens	Mesophyte	Climber	Ornamental
31		P. discolour	Mesophyte	Climber	Ornamental
32		P. microstictum	Mesophyte	Climber	Ornamental
33	16. Pistia	P. stratiotes	Hydrophyte	Herb	Edible
34	17. Pothos	P. scandens	Mesophyte	Climbing shrub	Ornamental
35	18. Remusatia,	R. vivipara	Mesophyte	Tuberous herb	Medicinal
36	19. Rhaphidophora (2)	R. decursiva	Mesophyte	Climbing shrub	Medicinal
37		R. pertusa	Mesophyte	Climbing shrub	Medicinal
38	20. Scindapsus (2)	S. officinalis	Mesophyte	Climbing shrub	Ornamental
39	• • • • • • • • • • • • • • • • • • • •	S. pictus	Mesophyte	Climbing shrub	Ornamental
40	21. Spathiphyllum	Spathiphyllum sp	Mesophyte	Herb	Ornamental
41	22. Syngonium (2)	S. neglectum	Mesophyte	Climber	Ornamental
42		S. podophyllum	Mesophyte	Climber	Medicinal
43	23. Theriophoum	T. minutum	Mesophyte	Herb	Wild plant
44	24. Typhonium (3)	T. inopinatum	Mesophyte	Herb	Medicinal
45	· · · · · · · · · · · · · · · · · · ·	T. roxburghii	Mesophyte	Herb	Medicinal
46		T. trilobatum	Mesophyte	Herb	Medicinal
47	25. Xanthosoma (4)	X. mafafa	Mesophyte	Giant herbs	Edible
48		X. robustum	Mesophyte	Giant herbs	Medicinal
49		X. sagttifolium	Mesophyte	Giant herbs	Edible
50		X. violaceum	Mesophyte	Giant herbs	Edible
51	26. Lemna (4)	L. aequinoctialis	Hydrophyte	Minute fronds	Animal feed
52		L. gibba	Hydrophyte	Minute fronds	Animal feed
53		L. minor	Hydrophyte	Minute fronds	Animal feed
54		L. perpusilla	Hydrophyte	Minute fronds	Animal feed
55	27. Spirodela	S. polyrhiza	Hydrophyte	Stemless fronds	Animal feed
56	28. Wolffia	W. globosa	Hydrophyte	Minute fronds	Animal feed

Key	12b. Rhizome hypogeal, short clumps, green				
1a. Hydrophytes2	leavesSpathiphyllam				
1b. Terrestrial8	13a. Rhizome creeping, internodes have 1-2 roots, leaves				
2a. Free floating3	alternate, trilobe				
2b. Marshy or submerged 4	13b. Rhizome erect, internodes small and don't have roots,				
4a. Thorny plants with lobed leaves	leaves forming an apical crown14				
4b. Not thorny5	14a. Leaves both surfaces variegated, 1-2 inflorescences per				
5a, ensiform leaves, aromatic	axil Dieffenbachia				
5b. Leaves grass like	14b. Leaves upper surface only variegated, 5-9 inflorescences				
Cryptocorne	per axil Agloanema				
3a. Fronds having one or more roots6	16a. Leaves 1-3 17				
3b. Fronds don't have any roots	16b. Leaves 2-several18				
6a. Stemless, leaves are small fronds one to three 7	17a. Single leaf, 3 -partite, dracontioid				
6b. Stem offset, rosette leaves	Amorphophallus				
7a. single frond, both surfaces green, single	17b. Leaves 1-2, leaflets pedately or radially arranged				
rootLemna	Arisaema				
7b. 2-3 fronds, lower surface purple, many	18a. Leaves peltate 19				
rootsSpirodela	18b. Leaves not peltate 20				
8a. Lithophytic 9	19a. Foliage leaves				
8b. Epiphytes or Climbers	19b. green leaves				
9a. Rhizomatous 10	20a. Leaf solitary or 2 leafless bulbiferous shoots				
9b. Cormatous16	Remusatia				
10a. Plants without milky latex11	20b. Leaves many, not bearing any leafless shoots21				
10b. Plants with milky latex, big leaves	21a. Spadix exerted from the spathe				
Xanthosoma	Typhonium				
11a. Leaves not broad, simple, linear, ovate or trilobed	21b. Spadix included in the spathe				
12	Theriophonum				
11b. Leaves broad, cordate or sagittate	22a. Plants contain milky latex				
Alocasia	Syngonium				
12a. Rhizome epigeal, Foliage leaves 13	22b. Plants do not contain milky latex 23				

Pothos

26b. Petiole long, geniculate near the apex, leaves ovate to suborbicular, ... .......Scindapsus

27a. Leaves pinnatifid, stinging roots short and many on internodes ...... *Epipremnum* 



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#### Conclusion

Wild and cultivated aroids hold great potential for food, medicine, and ornamental use. Their abundance in hilly regions offers valuable opportunities for further exploration and identification of unknown species. The author had a bitter yet memorable experience while working with aroids during her research. Out of curiosity, she once tasted *Typhonium* to know its flavour but the moment it touched the tip of her tongue, she lost her speech for half an hour, with an intense burning sensation and excessive salivation. On another occasion, she prepared curry using cocoyam without properly boiling it beforehand. Just a single bite caused severe irritation, swelling and inflammation in her mouth and throat, making it difficult to talk or swallow.

These experiences taught her that, although aroids are nutritious and delicious when cooked properly, they can be extremely harmful and irritating if consumed raw or undercooked.

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