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Morphological Variation in family Araceae

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Abstract: ***Araceae is one of the most diversified families of monocots which constitute a very natural and easy recognized group and exhibit great diversity in all morphological attributes and habitat preferences. It shows Profound differences in habitat preferences, growth pattern, phenology and adaptive modifications for effective pollination. The members of the family present remarkable variation in form and colour of spathe and appendages, male and female flowers and sexuality. During the study field visits were made to collect and study the Aroid Morphology. Most of the Aroids which were collected and introduced in botanical garden of the department are; Pothas scandens_Carl Linnaeus, Pistia stratiotes Carl.Linnaeus, Alocasia indica Schott, Philodendron scandens Schott. The study revealed that these members of Araceae shows definet variation with reference to vegetative, blooming time and spadix architecture. During one year survey of Aroids, critical observations were made on habitats, growth pattern, phenology and spadix architecture.***

Keywords: Appendages, Phenology, Spathe, Growth pattern.

1. Introduction

Araceae includes diverse group of plants which are shrubs or herbs or arborescent, lactiferous or with coloured juice, or non-lactiferous and without coloured juice, Normal plants. It includes perennial herbs with a basal aggregation of leaves or with neither basal nor terminal aggregation of leaves, often rhizomatous or tuberous. Plants are self supporting, epiphytic or climbing. Some are free floating (*pistia*). Stem may be underground or aerial or both. Underground stem often form tubers or rhizomes. The aerial stem may be erect or climbing (*Monster*). Some taxa have stolons e.g pistia. Monopodial growth throughout is characteristic of some pothoideae. The leaves vary considerably in shape. They are sheathing at the base and usually petiolate. The lamina is typically flate, lanceolate to broadly ovate. Leaves are broadly sessile in pistia. The leaf sheaths usually enclose the new leaves, but in sympodial system they enclose the terminal inflorescences, while the cataphylls protect the continuation of axes.

Araceae comprises about 110 genera and approximately 2500 species. They are pantropical, however, few occur in temperate regions. In India the family Araceae is represented by 29 genera and about 150 species. In Western Ghats, there are about 50 species belonging to 18 genara of which 35 species are endemic. One or the other member of the family is found in flowering state in a given month of year. The members show variation with reference to vegetative and reproductive characters.

The Araceae is one of the most important families of monocots attracted attention of several workers. Recent important systematic works on Araceae and its genera include that of Boyce and crot (2013), Bown (2000), Gonclaves et al., (2007). Specialized inflorescence structure, as spadix play a role in pollination of many Aroids (Young 1990). Members of the family present remarkable variation in form and colour of spathe and appendages, spadix Architecture, male and female flowers and sexuality (Yadav 1998). Thomas B.Croat examined the *Philodendron* species (2008) and compared it's inflorescence, blooming time, vegetative growth and colour of spathe and appendage with another species. He again examined it (2009) and has reached upto the conclusion that *Philodendron* has a sympodial growth which terminates in an in florescence, and the plant is blooming when adult size is attained or the blooming season. while studying variations in Araceae flowers in case of *Philodendron*, Barabe and Lacrosis (2000) came to the conclusion that the presence of bisexual flowers is believed to be correspond to a morphogenetic gradient at the level of the inflorescence as a whole.

2. Materials and Methods

During the study visits were made to so many places in Amravati city of Maharashtra to collect and study the Aroid Morphological variation. Critical observations were made on habitats, growth pattern and spadix architecture. The plant species were collected and introduced in botanical garden of the department.the genera which were collected are *Pothas scandens* Carl. Linnaeus, *Pistia stratiotes* Carl.Linnaeus, *Alocasia indica* Schott and *Philodendron scandens* Schott.

The members of Araceae showed profound differences in habitat preferences, growth pattern, phenology and adaptive modifications for effective pollination. There is definite correlation between spadix architecture, it's peculiarities and adaptive significance with reference to phenology and environmental factors. After comparing all the morphology of above mentioned species revealed that they show great variations in habit and habitat preferences, vegetative and reproductive morpholog and spadix architecture.

Further, observations were made on Morphological and phenological attributes of the species. Mayo[s] (1993) classification has been followed while describing characteristics, spadix architecture and peculiarities of each genus.

3. Discussion

Pothas scandens Carl. Linnaeus of tribe pothoeae subfamily pothoideae is characterized by climbing habitat, evergreen persistent leaves, bisexual flowers, monoecious spadix. All pothos species flower in summer i'e from February to may like other three species. All pothos species investigated so far have at least five types of shoot architecture. Once this

shoot begins to climb, a monopodial leafy, juvenile phase develops. This in turn leads to a Monopodial leafy strile mature face. In pothas scandens the spadix is globular with a small greenish-yellow spathe at the base.

Philodendron Scandens schott is a large genus of flowering plants in the Araceae family, consisting of close to 900 or more species. As compared to other genera of the family Araceae, *Philodendron scandens* have an extremely diverse array of methods by which they grow. The habits of growth can be epiphytic, Hemiepiphytic, or terrestrial although very few *Philodendrons* grow. The leaves of *Philodendron scandens* are usually large, imposing, and heart shaped, often lobed or deeply cut, and may be more or less pinnate, compared to other species having oval, spear-shaped or many other possible leaf variations. The leaves are born alternately on the stem. the leaves of seedling *Philodendrons* are usually heart-shaped.

Philodendron also produces cataphylls, which are modified leaves that sorround and protect the newly forming leaves. Cataphylls are usually green, leaf-like and rigid while they are protecting the leaf. Once the leaf has been fully formed, the cataphylls usually remain attached where the stem and base of the leaf meet. Thus the phenomenon of morphogenesis and modified form of leaves (cataphylls) were observed in *Philodendron* as compared to *Pothas scandens* and *Pistia stratiotes*, where as cataphylls form of leaves were also observed in *Alocasia indica*. During the study it has been observed that, a single inflorescence can be produced or a cluster of upto 11 inflorescences can be produced at a single time on short peduncles, where as in case of *Alocasia indica* 2-many inflorescences can be produced in each floral sympodium.

Alocasia indica Schott of subfamily Colocasiaideae is diminutive to medium sized, rarely arborescent and gigantic, evergreen or rarely seasonally dormant monoecious herbs with clear to milky latex. Stem thick, often hypogeal, sometimes stoloniferous and tuberiferous, when epigeal then stem usually errect, rarely elongated and creeping. As compared to *Philodendron* leaves are few to several in terminal crown, rarely solitary. Sometimes each leaf subtended by a cataphyll like *Philodendron*. Petiole long or glandular, margin entire, or slightly to deeply pinnatified, posterior divisions ovate or triangular; basal ribs well developed, waxy glands present in axils of primary lateral veins and midrib, primary lateral veins pinnate. 2-many inflorescences are produced in each floral sympodium.

Pistia stratiotes Carl.Linnaeus belonging to tribe pistieae of subfamily pistoideae is a free floating aquatic herb found in all tropical regions. It shows usual adaptations for aquatic habitat and general reduction in all the parts as compared to other three species observed so for; the spathe is small, short and greenish in colour. There is single necked female flower consisting of a unilocular ovary partly attached to the spathe, above the female flower there is one necked male flower with 4-6 stamens united into a synandrium. The pollen grains are sulcate. It is often stated that this genus forms a link between the Araceae and the Lamnaceae (Dahlgren et al, 1985), but this is unlikely, even though they may share a common ancestor not too far back in the phylogenetic history of the Araceae.

4. Conclusion

The study revealed that the family Araceae shows great variation in habit and habitat, blooming time, vegetative and reproductive morpholog and spadix architecture. Gradual elaboration of spadices can be traced in the family. Adaptive significance of spadix architecture is demonstrated and understood in many of the Aroids. The structural trends in the evolution of the Araceous inflorescence lead to functionally highly specialized pollination mechanisms based on the deception of insects that are unspecialized with respect to flower. The primitively constructed Araceae apparently were pollinated by unspecialized insects, and the architecture of inflorescence lent itself to evolution towards exploitation of unspecialized insects by deceptive syndromes in most of the Aroids, however, there is no co-evolution with more advanced insects as in other groups.

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