

PHENOLOGICAL OBSERVATIONS OF SOME DRY DECIDUOUS FOREST TREE SPECIES AT DAMOH DISTRICT (MP)

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ABSTRACT:- Present study is based on the some dry deciduous forest tree species in the flora of Damoh district reflects the diversity of 14 species and 09 families. The highest number of species recorded in the family Fabaceae (03). From biodiversity point of view the vegetation survey is very much important for the research of database from this region which ultimately can be utilized for medicinal experts, plants explorers, researches etc. for their further studies. Observations on leaf fall, new foliage, flowering and fruiting is one of the important phenomena in the life of plants because it is responsible for change in the pattern of plants growth and development along with the effects of the environmental factors over it. That period is called “**study of Phenology.**” The main objectives of the present study are observations on database of diversity of some dry deciduous forest tree along with records of their leaf fall, new foliage, flowering and fruiting periods. These data are useful to analysis of the Phenological pattern of tree species in the dry deciduous forest tree along disturbance gradient to understand the response of tree species to climate factors and the periodicity of seasons.

KEYWORDS -: Annual, Climate, Species, Environment.

INTRODUCTION:-

Phenology is the study of growth of buds, leaf flushing, a thesis; flowering, fruiting and leaf fall in relation to seasons or year with climate factor. Phenology {derived from the Greek word **Phaino** meaning to show or to appear} is the study of **Plants and Animals** growth. The phenological studies are important from the point of view of the conservation as well as for a better understanding of the ecological adaptations of plant species and community level interactions. The plants

interactions in the community are based on the knowledge of seasonal production of plant parts. From distribution point of view trees are very common in tropical and subtropical countries in the world but better distributed in tropics than temperate regions (Richard, 1996). But the frequencies of dry deciduous tree are increasing due to climate change. The data is on the basis of the modifications of plant organs. From incentive literature surveys it was observed the most of the work were done from the vegetation point of view expects some noted work on dry deciduous trees from many parts of Damoh.

The needs to evaluate phenological data of forest species has been felt long in the fields of Botany. Attempts have been made by various researcher and workers like Ganpatya and Rangrajan (1964), Ramakrishna et.al (1981), Singh and Singh (1992), Yadav P. S. et.al (2001), above to collect phenological data of the flora from various regions. The tropical dry forests harbor several phonological functional types showing widely varying leafless periods and rates of resource use during vegetative growth (Kushwaha and Singh, 2005) There is no report on phenological pattern of tree species in the dry deciduous forest of Damoh. Therefore the present study aims to analysis the Phenological pattern of tree species in the dry deciduous forest along disturbance gradient to understand the response of tree species to climate factors and the periodicity of seasons.

MATERIALS AND METHODS:-

Study Area and Field Survey: - Present study reveals that Damoh district of Madhya Pradesh has rich flora and fauna especially Jabera, Singrampur, Singaurgarh, Tendukheda, Rani Durgawati National Sanctuary and (Nauradehi National Sanctuary) Taradehi – jhalon region. There is a dense forest including Saal and Teak

plants. Climate and Geographical convolution are applying this territory as biodiversity hub to produce and conserve the desired for many researches of flora and fauna. Damoh is a part of **Bundelkhand** region, it is situated between 23.50° north latitude and 79.33° east longitude. Climate is warm and temperate. Soil in this area is residual, derived from basalt out crop.

Phenological observations were made of selected 14 tree species. Five individual of each of the 14 tree species were marked and tagged. Detailed observations were

carried out at monthly intervals over a period of two years (2018 to 2020) for tagged tree. Records were made of leaf drop, leaf flushing, flowering and fruiting. The phenological activity for each forest tree was evaluated as the sum of species with different phenological stage every month.

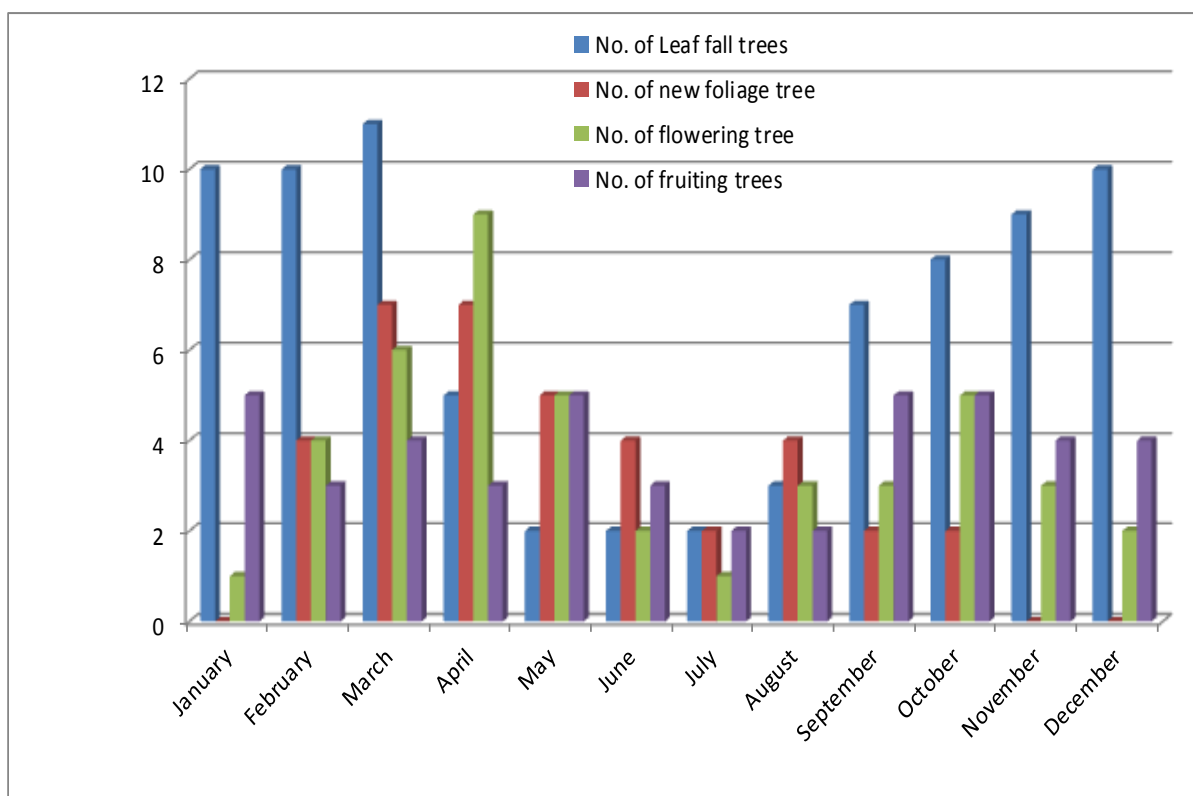
Observations: - List of dry deciduous forest tree along with their Botanical name, family, common name and Phenological activities.

Table No.1 - List of dry deciduous forest tree along with their Botanical name, family, common name and Phenological activities.

S. N.	Botanical name of plants	Family	Common name	Phenological activities				
				Leaf fall	New foliage	Flowering	Fruiting	Vegetative
1	<i>Acacia nilotica</i> L.	Mimosaceae	Babul	Sep-May	Jun-Aug & Feb-Mar	Jul-Nov	Oct-Mar	Apr-Jun
2	<i>Adansonia digitata</i> L.	Malvaceae	Baobab	Sep-Dec	Jun-Aug	Jan-May	Jun-May	Dec-May
3	<i>Albizia lebbek</i> L.	Mimosaceae	Shirish	Nov-Jan	Mar-May	Mar-Jun	Aug-Dec	Jan-Feb
4	<i>Anogeissus latifolia</i> Roxb.	Combretaceae	Dhawa	Sep-Dec	Jul-Aug	Sep-Oct	Sep-Dec	Jan-Aug
5	<i>Azadirachta indica</i> A. Juss.	Meliaceae	Neem	Sep-Mar	Feb-Jul	Mar-Apr	Apr-Jul	Aug-Feb
6	<i>Bauhinia purpurea</i> L.	Fabaceae	Kachnar	Oct-Apr	Apr-Oct	Oct-Dec	Dec-Feb	Mar-Sep
7	<i>Cassia fistula</i> L.	Fabaceae	Golden shower tree	Aug-Mar	Jun-Jul	Apr-May	Aug-Feb	Mar-Apr
8	<i>Derris indica</i> Lam.	Fabaceae	Karanj	Jun-Jan	Feb-Aug	Apr-May	Jun-Mar	Feb-Mar
9	<i>Sapindus laurifolius</i> Vahl.	Sapindaceae	Soapnut tree	Nov-Apr	May-Aug	Aug-Dec	Jan-Feb	Mar-Jul
10	<i>Thespesia populena</i> L.	Malvaceae	Indian tulip tree	Jan-Dec	Jun-Oct	Aug-Oct	Nov-Dec	Jan-Jul
11	<i>Madhuca longifolia</i>	Sapotaceae	Mahua	Feb-Apr	Apr-May	Feb-Apr	Mar-May	Jun-Jan
12	<i>Terminalia arjuna</i> Roxb. Wight & Arn.	Combretaceae	Arjun	Feb-Apr	Mar-May	Mar-Jun	Sep-Nov	Jun-Dec
13	<i>Aelge marmelos</i> L. Correa.	Rutaceae	Bel	Jan-Mar	Feb-Mar	Feb-Apr	Mar-May	Apr-Sep
14	<i>Shorea robusta</i> Roth.	Dipterocarpaceae	Salwa, Asina	Jan-Mar	Mar-May	Feb-Apr	May-July	Jun-Aug

Table (2):- Month wise Leaf fall, new foliage, Flowering and Fruiting

Month	No. of Leaf fall tree	No. of new foliage tree	No. of flowering tree	No. of fruiting tree
January	10	NA	01	05
February	10	04	04	03
March	11	07	06	04
April	05	07	09	03
May	02	05	05	05
June	02	04	02	03
July	02	02	01	02
August	03	04	03	02
September	07	02	03	05
October	08	02	05	05
November	09	NA	03	04
December	10	NA	02	04



Aim of the study:-

The current study is an approach to find phenological observations of some dry deciduous forest trees.

Phenological studies have a direct impact on the productivity of forest ecosystem and its biodiversity.

Phenological studies of plants provide the knowledge about the pattern of plant growth and development as well as the effects of climate change, Global warming and environmental factors. Phenology is important for the study of plants and animals interaction which affect pollination and dispersal, and are important for plant reproduction.

RESULT AND DISCUSSION:-

From the present phenological account it appears that **seasonal activity** in dry deciduous tree flora of Damoh district MP in general is more conspicuous in summer months (March-May). However, in species like *Adansonia digitata*, *Albizia lebbek*, the phenological phases are conspicuous in rainy season (Jul-Aug). The *Bauhinia purpurea*, *Anogeissus latifolia* and *Sapindus laurifolius* show conspicuous phenological changes in cold season (Sep-Dec). The annual phenological cycle starts from leaf fall phase followed by blossoming phase. The phenomenon of emergence of flowers on bare branches before new foliage phase is characteristically peculiar and conspicuous in the deciduous tree flora. A few deciduous species like *Adansonia digitata*, *Albizia lebbek*, *Azadirachta indica* exhibit flowering phase along with or even after new foliage phase. Phases of fruiting and new foliage appearance take place either subsequently. The phenological cycle, particularly the reproductive phase in deciduous tree species is of short duration. However in *Bauhinia purpurea*, flowering phase is remarkably prolonged. In *Adansonia digitata*, *Albizia lebbek*, *Cassia fistula* and *Derris indica* fruiting phase lasts till next phenological cycle on the tree. The data obtained from these studies have botanical importance, particularly in the fields of forest and ecology.

Number of trees reported and their diversity: In the literature search for the present paper, it was found, that most of these studies lack proper information about leaf fall, new foliage, flowering, fruiting and vegetative of the reported trees. In a current review paper, a total of 14 species belonging to 09 families and 14 genera has been listed, in Damoh District (From the table no.1). Fabaceae was predominant family having (3 species) followed by Combretaceae (2 species), Malvaceae (2 species), Mimosaceae (2 species), Rutaceae (1species),

Dipterocarpaceae (1species), Sapindaceae (1species), Meliaceae (1species), Sapotaceae (1species). From table no. (2), data observations shows that highly **Leaf fall** in the month of March followed by January, February, September, October, November and December. From the table no.(2), data observations shows that high level **new foliage** of trees in the month of March and April followed by May, August and February. From the table no.(2), data observations shows that highly **flowering** in the month of April, followed by March, May, October and February. From the table no.(2), data observations shows that high level of **fruiting** in the month of January, May, September and October, followed by March, November and December.

CONCLUSION:-

The phenological behavior of the dry deciduous tree species observed, mostly the flowering activities in these species in the year with two peaks first March-April, and second July-August. Fruiting of these species is observed in the months of Sep-Oct and Apr-June. Biodiversity is the major source of raw materials for the stability of the ecosystem, fodder, herbal medicine, source of food etc. the vegetation structure of study area is gradually deteriorating due to anthropogenic activities as well as over exploitation of flora. So these species need special attention on priority basis in view of the conservation of these dwindling, disappearing, keystone species, as well as sustainable development for the future generation.

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