

## Leafing, flowering and fruiting pattern of some species of caesalpiniaceae from Buldhana district (M.S.), India

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### ABSTRACT

Phenological study is useful to understand regularities in the course of life of plants depending on external conditions of the environment. It is a valuable source of information for the onset and duration of growing seasons in various climatic regions. The present investigation provides the information regarding the phenological events of family Caesalpiniaceae found in Buldhana district of Maharashtra, India. The phenological Characters such as Leafing, flowering and fruiting behavior of 15 plant species of Caesalpiniaceae were studied. From this study the peak period of leafing was found to be Throughout year (for 4 Species) the peak period of flowering shows Throughout year (for 4 Species) and the peak period of fruiting activity was found to be Throughout year (for 4 Species) followed variedly in other species. Such observation will be useful to the students, researcher and people of this region.

**Key words:** Leafing, Flowering, Fruiting, Phenology, Caesalpiniaceae,

### INTRODUCTION

Plants are very much responsive to the various environmental factors and these responses are shown in the form of externally visible changes which are called as phenophages and the study of such phenophages are called phenology. Phenology is the date and timing of occurrence of the various biological events in the life cycle of plant, which gives valuable information about the on functional rhythms of plant communities. It is the science of studying life-cycle events of plants and animals, and their responses to seasonal and inter-annual variation in climate (Morissette *et al.*, 2008).The phenological events are important in describing and explaining the seasonal aspects of ecological phenomenon (Leith1970).

Study of plant phenology gives the valuable source of information about the onset and duration of growing seasons in various climatic regions and it is essential to understand the dynamics of plant communities, which of course impact animal populations as well.

Plants of family Caesalpiniaceae are cosmopolitan in distribution showing variation in habit and habitat and are distinguished by uni or bipinnate compound leaves with pulvinus leaf base and without stipels. Racemose inflorescence is most common. Flowers are slightly zygomorphic, pentamerous with free sepals and petals, mostly with imbricate aestivation. The odd petal is smaller and posterior.

The stamens are ten in number or fewer by reduction or sterility. The gynoecium is monocarpellary, unilocular and the ovules are arranged in two alternating rows on marginal placentation. The pistil is stalked, perigynous; thalamus cup-shaped and the ovary half-superior.

There is a lot of demand for database of plants all over the world. We cannot fully utilize the plants of any area or region, without knowing the basic data about their availability, Study of plant phenology gives us the exact timing of occurrence of various biological events in plant life cycle, so it will be useful in developing proper management strategy as well as better understanding of forest regeneration potential and community level interactions.

#### MATERIAL METHODS

Buldhana district came under the Amravati division. It is the western border of the Vidarbha. The district is located at 19.51° and 21.17° N latitude and 75.57° and

76.59° E longitude. Buldhana district comprises thirteen tehsils namely, Jalgaon Jamod, Sangrampur, Shegaon, Khamgaon, Nandura, Malkapur, Motala, Chikhali, Mehkar, Deulgaon Raja, Lonar, Sindkhed Raja and Buldhana. The district is bounded by Akola, Buldhana and Amravati district on east, Jalgaon and Aurangabad on west, Madha Pradesh on north, and Jalna district on south. The total area of the Buldhana district is 9640 sq. km. and the forest areas occupy 8.8% of the total area of the district. The forest of the district is a southern tropical dry deciduous forest having hilly region (Champion, and Seth, 1968).

The phenological study for leafing, flowering and fruiting was done on 15 species of the family Caesalpiniaceae of Buldhana district, Maharashtra. The detailed observations were carried out about the leaf initiation, flowering and fruiting behavior of plant species at monthly intervals over a period of one and half year (Jan 2016 to Dec. 2017) as shown in the table 1. and are arranged in alphabetical order.

#### RESULTS & DISCUSSION

The Phenological observations of leaf initiation, flowering and fruiting were recorded month wise, as shown in the table 1. Total 15 plants species of family Caesalpiniaceae were studied from Buldhana district Maharashtra and arranged with alphabetical order.

**Table 1: Phenological observation**

| Sr. No. | Name of Plant species                      | Leaf Initiation  | Flowering        | Fruiting         |
|---------|--|------------------|------------------|------------------|
| 1.      | <i>Bauhinia purpurea</i> L.                | Feb-Mar          | Sep-Nov          | Jan-Apr          |
| 2.      | <i>Bauhinia racemosa</i> Lam.              | May-Jun          | Apr-Jun          | Nov-Jan          |
| 3.      | <i>Bauhinia vahlii</i> Wight & Arn.        | Jun-Aug          | Jul-Aug          | Nov-Jan          |
| 4.      | <i>Caesalpinia bonduc</i> (L.) Roxb.       | Jun-Jul          | Aug-Sep          | Sep-Oct          |
| 5.      | <i>Caesalpinia pulcherima</i> (L.) Swartz. | Through-out year | Through-out year | Through-out year |
| 6.      | <i>Cassia auriculata</i> L.                | Through-out year | Through-out year | Through-out year |
| 7.      | <i>Cassia fistula</i> L.                   | Apr-Jun          | May-Jun          | May-Jul          |
| 8.      | <i>Cassia occidentalis</i> L.              | Apr-Jun          | Aug-oct          | Oct-Jan          |
| 9.      | <i>Cassia siamea</i> Lam                   | Through-out year | Through-out year | Through-out year |
| 10.     | <i>Cassia tora</i> L.                      | Jul-Aug          | Aug-Oct          | Oct-Jan          |
| 11.     | <i>Hardwickia binata</i> Roxb.             | Apr-Jul          | Jul-Aug          | Feb-Mar          |
| 12.     | <i>Parkinsonia aculeate</i> L.             | Jan-Mar          | Sep-May          | Dec-Jun          |
| 13.     | <i>Peltophorum pterocarpum</i> (DC.) Baker | Through-out year | Through-out year | Through-out year |
| 14.     | <i>Saraca asoka</i> (Roxb.) de Wilde.      | Apr-Jul          | Feb-Apr          | Sep-Dec          |
| 15.     | <i>Tamarindus indica</i> L.                | Apr-Jul          | May-Aug          | Jan-Apr          |

**Table 2: Result Analysis of Leafing Activity of family Caesalpiniaceae in Percentage.**

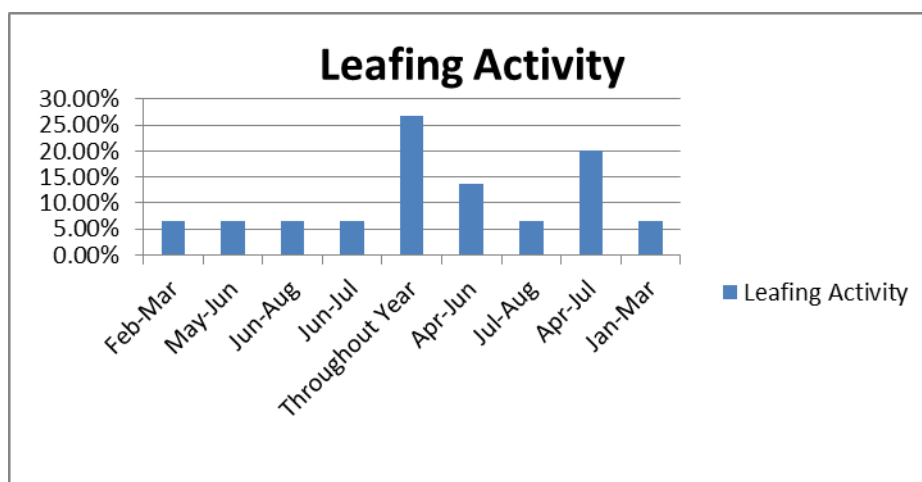
| Leafing Activity | Feb-Mar | May-Jun | Jun-Aug | Jun-Jul | Throughout Year | Apr-Jun |
|------------------|---------|---------|---------|---------|-----------------|---------|
|                  | 6.66%   | 6.66%   | 6.66%   | 6.66%   | 26.66%          | 13.66%  |
|                  | Jul-Aug | Apr-Jul | Jan-Mar |         |                 |         |
|                  | 6.66%   | 20%     | 6.66%   |         |                 |         |

**Table 3: Result Analysis of Flowering Activity of family Caesalpiniaceae in Percentage.**

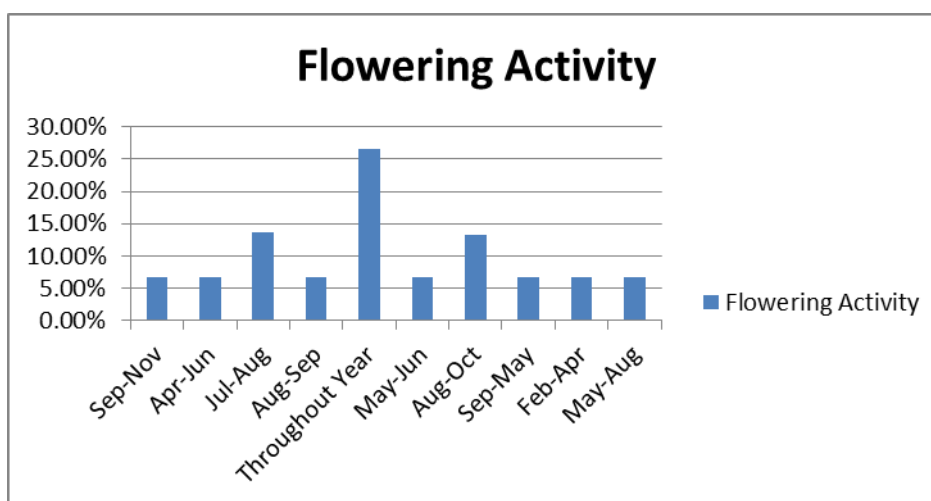
| Flowering Activity | Sep-Nov | Apr-Jun | Jul-Aug | Aug-Sep | Throughout Year | May-Jun |
|--------------------|---------|---------|---------|---------|-----------------|---------|
|                    | 6.66%   | 6.66%   | 13.66%  | 6.66%   | 26.66%          | 6.66%   |
|                    | Aug-Oct | Sep-May | Feb-Apr | May-Aug |                 |         |
|                    | 13.33%  | 6.66%   | 6.66%   | 6.66%   |                 |         |

**Table 4: Result Analysis of Fruiting Activity of family Caesalpiniaceae in Percentage.**

| Fruiting Activity | Jan-Apr | Nov-Jan | Sep-Oct | May-Jul | Throughout Year | Oct-Jan |
|-------------------|---------|---------|---------|---------|-----------------|---------|
|                   | 13.66%  | 13.66%  | 6.66%   | 6.66%   | 26.66%          | 13.66%  |
|                   | Feb-Mar | Dec-Jun | Sep-Dec |         |                 |         |
|                   | 6.66%   | 6.66%   | 6.66%   |         |                 |         |



**Figure. 1: Leafing Activity of family Caesalpiniaceae**



**Figure. 2: Flowering Activity of family Caesalpiniaceae**

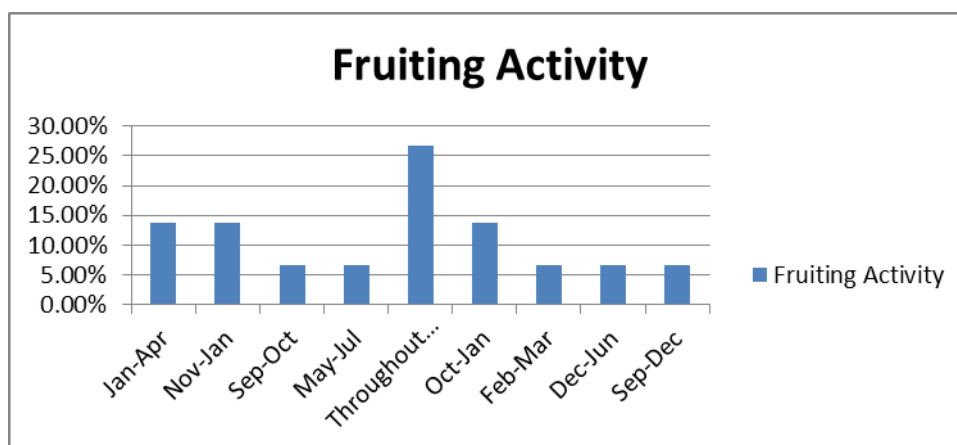


Figure. 3: Fruiting Activity of family Caesalpiniaceae

From the table it is observed that the peak period for leafing in Caesalpiniaceae plant species was found to be Throughout year (04 Species), Apr-Jul (03 species), Apr-Jun (2 species) followed by variedly in other species. Flowering continued in different species in different month and it is observed that Throughout year (04 Species), Jul-Aug (2 Species), Aug-Oct (2 species) and remaining species have shown variation in the month for its flowering. The fruiting period was observed Throughout year (04 Species), Jan-Apr (2 Species), Nov-Jan (2 species), Oct-Jan (2 species) and remaining species have shown variation in the month for its fruiting.

### CONCLUSION

The present phenological study is useful to understand regularities in the course of life of plants depending on external climatic conditions of the environment. It provides an important source of information about the onset of different biological events or phenophases, in the life cycle of plants and duration of growing seasons. From this study it is concluded that maximum leafing, flowering and fruiting activities was found Throughout year (4 Species). Such observation will be useful to the students, researcher and people of this region.

**Conflicts of interest:** The authors stated that no conflicts of interest.

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