



## PHENOLOGICAL STUDY OF SOME SPECIES OF FABACEAE FROM BULDHANA DISTRICT, MAHARASHTRA (INDIA)

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### Abstract

Plant Phenological study has great significance as it not only provides knowledge about plant growth pattern but also an idea about the effect of environment and selective pressure on flowering and fruiting behavior of the plant species. It is useful to understand regularities in the course of life of plants depending on external conditions of the environment. Phenology is important source of information about the beginning of growing season in various climatic conditions. Present study was carried out to analyze the phenology of 20 species of Fabaceae from Buldhana district Maharashtra. The phenological characters such as leaf initiation, flowering and fruiting were studied during Jun 2015 to December 2016. From this study it is found that leaf initiation peak in Jul-Aug (04 species), the peak period of flowering is Sep-Nov (03species) and fruiting peak in the month of Sep-Dec (04 species).

**Keywords:** Phenology, Germplasm, Fabaceae.

### Introduction:

The term phenology was first introduced by the Belgian botanist Charles Morren in 1853, which is derived from the Greek words phaino meaning “to appear, to come into view” and logos mean “to study”. So phenology is the study of timing of seasonal biological activities (Brian P. Haggerty and Susan J. Mazer 2008) or Phenology is literally “the science of appearance.” (Kasarkar R. and Kulkarni D. 2011) or Phenology is the periodic phenomena of plants in relation to changes in season and climate (Namita nath 2012). The phenological

studies are important for better understanding of ecological adaptations, interactions of individual species and also from the point of view of germplasm conservation (Stern and Roche 1974, Waser 1979, Thomson 1978).

Study of phenology is also important to the conservation and forestry management point of view and it is also important for a better understanding of the ecological adaptation in the community which are based on the knowledge of seasonal production of plant parts (Desai, *et.al* 2010).

Fabaceae is the second after Poaceae in turn of agricultural and economic point of view. Fabaceae is one of the most important family not only medicinal but also economical point of view. Legumes include a large number of plant species which are harvested as a food for human and animal consumption also harvested for oils, fiber, fuel, fertilizers, timber, medicinal, and chemicals (Lewis *et.al.*, 2005). The seeds are rich in starch and protein forming a wide source of food. Looking to its great ecological and economical importance the family Fabaceae is studied from Buldhana district. Observing the importance of phenology of the Fabaceae species in the present locality, the work was carried out during the year June 2015 to December 2016. The aim of the present study is to analyze the phenological pattern of some species of Fabaceae from Buldhana District, Maharashtra.

### Material and Method:

**Site:** Buldhana district came under the Amravati division. It is the western border of the Vidarbha. The district is located at 19.51<sup>0</sup> and 21.17<sup>0</sup> N latitude and 75.57<sup>0</sup> and 76.59<sup>0</sup> E longitude. 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 phenological observation was made of 20 species of the family Fabaceae from Buldhana district, Maharashtra. The detailed observations were carried out about the leaf initiation,

flowering and fruiting behavior of the plant species at monthly intervals over a period of one and half year Jun 2015 to December 2016, as shown in the table 1. And are arranged in alphabetical order.

**Table 1: Month wise phenological observation**

Sr.No	Name of Species	Leaf Initiation	Flowering	Fruiting
1.	<i>Alysicarpus bupleurifolius (L.) DC.</i>	Jul-Aug-	Sep-Nov	Oct-Nov
2.	<i>Atylosia scarabaeoides (L.) Benth.</i>	Aug-Sep	Sep-Oct	Oct-Dec
3.	<i>Canvalia gladiata (Jacq.) DC.</i>	Jun-Aug	Jul-Dec	Oct-Jan
4.	<i>Cassia tora</i>	Jul-Aug	Jul-Aug	Dec-Jan
5.	<i>Erythrina suberosa Roxb.</i>	Apr-May	May-Jun	Oct-Dec
6.	<i>Indigofera astragalina DC.</i>	Jun-Jul	Jul-Oct	Sep-Dec
7.	<i>Indigofera linnaei</i>	Jul-Aug	Aug-Dec	Sep-Jan
8.	<i>Indigofera trita L.</i>	May-Jun	Sep-Nov	Dec- Mar
9.	<i>Mucuna prurience (L.) DC.</i>	Jul-Aug	Aug-Dec	Oct-Dec
10.	<i>Pongamia pinnata (L.) Pierre</i>	Jun-Jul	Jul-Sep	Jul-Sep
11.	<i>Caesalpinia bonduc (L.) Roxb.</i>	May-Sep	Jun-Oct	Oct-Dec
12.	<i>Cassia auriculata L.</i>	Throughout	Throughout	Throughout
13.	<i>Cassia occidentalis L.</i>	Apr-Jun	Aug-Nov	Oct-Jan
14.	<i>Cassia fistula L.</i>	Apr-May	Apr-Jun	Jul-Aug
15.	<i>Acacia nilotica (L.) Willd ex Del.</i>	Apr-Jun	Mar-Jul	Sep-Dec
16.	<i>Parkinsonia aculeata L.</i>	Mar-May	Sep-Oct	Aug-Nov
17.	<i>Dichrostachys cinerea (L.) Wight &amp; Arn.</i>	Feb-May	Sep-Nov	Dec-Feb
18.	<i>Pithecellubium dulce (Roxb.) Benth.</i>	Sep-Nov	Dec-Mar	Mar-Apr
19.	<i>Caesalpinia pulcherima (L.) Swartz.</i>	Throughout	Throughout	Throughout
20.	<i>Vigna trilobata (L.) Verdc.</i>	May-Jun	Aug-Sep	Sep-Oct

### Results and Discussion:

#### Leaf Initiation:

From the table 1 it was found that Leaf initiation of the plant species of Fabaceae shows variation between species to species. The peak period of leaf initiation was Jul-Aug (04), followed by May-Jun (02), Apr-May(02), Jun-Jul (02), Apr-Jun (02), and other plant species of Fabaceae shows variation in their leaf initiation

**Flowering Activity:** Flowering period is also variable between these species. However the peak period of flowering was distinguished in Sep-Nov (03) followed by Sep-Oct (02), Jul-Oct (02), Aug-Dec (02) and other plant species of Fabaceae shows variation in their flowering activity

#### Fruiting Activity:

The peak period of fruit maturation was found to be Sep-Dec (04) followed by Oct-Dec (03), Oct-Jan (02) and rest of other plant species showed variation among themselves.

#### Conclusion:

The plant species of family Fabaceae of Buldhana district exhibits great diversity in their phenological characters such as leaf initiation, flowering and fruiting. In recent time climate is warming on a global scale due to increase in temperature, which has notable effects on phenology of plants. It is well accepted that the climate is changing due to increase anthropogenic activity and it is expected to have direct impact on socio- economic sectors such as forestry, and agriculture. So such a type of study provide important insights into the

biology of the plants concerned and reveal phenological pattern of surveyed species. From this study it is concluded that maximum leaf initiation was found in the month of Jul-Aug (04 Species), Maximum flowering period was observed in the month of Sep-Nov (03 Species), and maximum fruiting is found in the month of Sep-Dec (04 Species). Such a study is not only important biologically but also it has ecological importance.

**References:**

**Brian P. Haggerty and Susan J. Mazer 2008;** The Phenology handbook, A guide to phenological monitoring for students, teachers, families and nature enthusiasts. University of California, Santa Barbara.

**Desai P.B. and Patel N. K. (2010),** Phenological study of trees species of Satlasana range forest (North Gujarat) Life Science Leaflets 3:41-46.

**Kasarkar R. and Kulkarni D. 2011.** Phenological studies of Family Zingiberaceae with special reference to *Alpinia* and *Zingiber* from Kolhapur region (MS) India. Bioscience discovery, 2 (3): 322-327. ISSN: 2229-3469.

**Namita nath (2012),** Phenological study of some tree species of srisurva pahar of Goalpara district, Assam Indian Journal of Fundamental and Applied Life Sciences Vol. 2 (1) January-March, pp. 102-104.

**Stern K and Roche L. 1974.** Genetics of forest ecosystems. Chapman & Hall Ltd., London; Springer-Verlag, Berlin, Heidelberg, New York, pp 330.

**Thompson K. 1978.** The occurrence of buried viable seeds in relation to environmental gradients. *Journal of Biogeography.* **5:** 425-430.

**Waser NM. 1979.** Pollinator availability as a determinant of flowering time in ocotillo (*Fouquieria splendens*). *Oecologia.* **39:** 107-121.