

## Effect of seasonal variation in photosynthetic pigments of few medicinal plants species of Jhansi

CHARU GUPTA AND VANDANA MISHRA

Accepted : June, 2010

### SUMMARY

Photosynthesis is fundamental basis of competitive success in green plants and the principal organ of photosynthesis in higher plants in leaf. It is the most important metabolic activity performed by green plants. In present investigation, an attempt has been made to study the seasonal variation in photosynthetic pigments chlorophyll a, chlorophyll b and total chlorophyll of few medicinal plants species of Jhansi. In present study out of Nine medicinal plants, *Acacia nelotica*, *Azadirachta indica*, and *Jatropha curcas*, are potential medicinal plant followed by, *Vinca rosea*, *Adhatoda vasica*, *Calotropis procera*, *Syzygium cumini*, *Ocimum sanctum* and *Eucalyptus globules*.

**Key words :** Seasonal variation, Photosynthetic pigments, Medicinal plants

Plant biomass and productivity depends on efficiency of photosynthetic activity. Photosynthesis is most important metabolic activity performed by green plants. It not only builds up food for plant by harvesting solar energy, but also sustains its flow of energy in the biosphere. Presence of chlorophyll in green plants makes them unique in living world for they only can capture the solar energy and convert it into chemical energy. It is a phenomenon of utmost significance for the existence of the entire life on this plant (Tiwari and Rai, 2002). Chlorophyll is the molecule that absorbs sunlight and uses its energy to synthesize carbohydrates from CO<sub>2</sub> and water. This process is known as photosynthesis and is the basis for sustaining the life processes of all plants. Since animals and humans obtain their food supply by eating plants, so photosynthesis can be said to be the source of our life also. Role of chlorophyll as the main triggering molecule in photosynthesis is known for over two hundred years now. In higher plants (Angiosperms) synthesis of chlorophyll is light dependent reaction while is lower vascular plants and some algae it is an enzyme coupled dark relation (Devilin, 1983). In order to absorb light efficiently a typical leaf presents a large surface area at approximately right angle to the incoming sunlight. From this perspective, the leaf may be viewed as a photosynthetic machine, superbly engineered to carry out

photosynthesis efficiently in an externally hostile environment. (Hopkins *et al.*, 2003). Chlorophyll content in leaf tissue varies with species, age of plants and growing season. Among the climatic factor light and temperature during the growth season. Among the climatic factor light and temperature during the growth period have more pronounced effect on chlorophyll content, the high chlorophyll a: b ratio represents the high efficiency of photosynthesis (Bhatt and Sinha, 1990)

### Study site:

Jhansi is the headquarters of Bundelkhand region of Uttar Pradesh. Geographically it is situated between 25° -27', North of latitude and 78° 35' East of longitude with 271m above mean sea level in semiarid of central India. The topography of region lies within 271m above mean sea level in general and exceeds over 431 in some cases. The hypsometric curve of the region show that about 28.7% of the area is under 271m and 67.7% less between 300 and 400m with small area (3.6%) above 431m.. The climate of Jhansi is relatively moderate and dry except in the monsoon season. This region is tropical sub humid and distinct seasonally. It is characterized by 3 season viz. summer, Rains and winter. The average annual rainfall is 903mm. with about 42% precipitation following during the monsoon months of June to September On an average there are 30 rainy days in an year in the district.

### Correspondence to:

CHARU GUPTA, Department of Botany, Institute of Basic Science, Bundelkhand University, JHANSI (U.P.) INDIA

### Authors' affiliations:

VANDANA MISHRA, Department of Botany, Institute of Basic Science, Bundelkhand University, JHANSI (U.P.) INDIA

### MATERIALS AND METHODS

The present investigation was conducted to study seasonal variation in photosynthetic pigments of few medicinal plant species of Jhansi region (Year, 2007). The amount of chlorophyll a, chlorophyll b, and total chlorophyll