PHYSIOLOGICAL STUDIES ON ROOTING BEHAVIOUR IN JUVENILE SEEDLINGS OF *PHASEOLUS VULGARIS* IN LIGHT AND DARK

Bhavana Gaur

Department of Botany,
R.G. (P.G.) College, Meerut–250001, India
E mail:gaurbhavana@yahoo.com

Abstract: *Phaseolus vulgaris* is an important pulse, belonging to family Fabaceae, is an important source of vegetarian diet. Due to its food value, its plants are cultivated from very ancient times. For cultivation of plants, the first and foremost come roots, which help in fixation of plants and in supplying water and minerals to developing plants. Root studies from physiological point of view are very important. Here physiological aspect of root development has been studied in juvenile seedlings of *Phaseolus vulgaris* and rooting behaviour is studied in light and in dark. The root starts with emergence of radicle, an indication of germination of seeds. During further studies on root growth, the roots take over a particular length. The root length has been recorded here. Differentiation of lateral roots is again an important part of root architecture. Whether lateral roots initiate early or late has been observed here. Lastly average number of lateral roots differentiated at a particular point of time has been observed here. Here rooting behaviour of roots of *Phaseolus vulgaris* has been studied covering all above mentioned aspects in light and dark. Studies started with emergence of radicle at the time of seed germination and rooting behaviour of juvenile seedlings of *Phaseolus vulgaris* was observed for 7 days in light and dark. Light promoted emergence of radicle, while dark promoted rest of the root activities i.e. root length, differentiation of lateral and average number of lateral roots.

Key words: Physiological aspects, Rooting behaviour, Root architecture, Juvenile seedlings, Radicle, Lateral root differentiation.

REFERENCES

Abdul-Baki, A.A. and Anderson (1973). Vigor determination in soyabean seed by multiple criteria. *Crop Sciences*, **13**: 630 – 633.

AL – Subai, M.Y. and Horwath, I. (1981). The effect of alternating periods of light and darkness on the tissue of *Phaseolus vulgaris* cultivar. Acta Univ. Szged Acta Biol., **26**: 41-50.

Babu, V.R. and Kumar, S. (1979). Seed germination and early seedling growth of *Cicer arietinum* Linn. CV C- 235, *Cajanus cajan* sprang. CV. Pusa Agati, *Phaseolus aureus*. Ham. CV. 5-8 and *Phaseolus mungo* Linn. CV. P-1 undergrowth regulators and salinity stressed conditions. *J. Ind. Bot. Soc.*, **58**: 140-148.

Biran, I. and Halevy, A.H. (1973). Endogenous levels of growth regulators and their relationship to the rooting of *Dahlia* cuttings. *Plant Physiol.*, **28**: 436 - 442.

Blaauw–Jensen, G. (1954). On the light induced transformation of Chlorophyllide into a growth inhibiting substance. Proc. Kon. Alkad. Wat. Amsterdam. C **51**: 498 – 506.

Challenger, S.; Lacey, H.J. and Howard, R.H. (1964). The demonstration of root promoting substances in apple and plum root stock. Ann. Rep. Mailing Res. Stn. **15**: 124.

Chauhan, R.S. and Nautiyal, M.C. (2007). Seed germination and seed storage behaviour of *Nardostachys jatamansi* DC, an endangered medicinal herb of high altitude Himalaya. *Curr. Sci.*, **92**: 1620 – 1624.

Dave, D.N. and Jain, B.K. (2009). Allelopathic effect of *Chenopodium album* L. on in vitro seed germination of *Triticum aestivism* L. *J. Indian Bot. Soc.*, **88**(1&2): 191 – 194.

Elliott, B. (2004). Factors that affect canola germination, Seed and Seedling vigour. Canola Council of Canada, Lombard Avenue, Winnipeg, MB R 3 BOT 6.

Evenari, M. (1949). Germination Inhibitors. *Bot. Rev.*, **15**: 153 – 194.

Gonzales, Zuniga, J.J. and Rojas Garciduenas (1957). Actions of 2, 4 – dichlorophenoxy acetic acid on the apical meristems and more differential zones of roots of the bean plant. *Ciencia Mexico*, **17**(1/3): 14 – 15.

Hess, C.E. (1964). Naturally occurring substances which stimulate root initiation pp 517 – 527 I JPW Nitsch (ed) "Regulateurs Naturels de le Croissance Vegetala: CNRS, Paris.

Jyung, W.H.; Ehlnann, A.; Schlenders, K.K. and Scala, J. (1975). Zn Nutrition and Starch Metabolism in *Phaseolus vulgaris*. *Plant Physiol*., **55**: 414 – 420.

Korban, S.S.; Coyne, D.P. and Weihing, J.L. (1981). Rate of water up-taken and sites of water entry in seeds of different cultivars of dry bean (*Phaseolus cultiar*) *Hort. Sci*., **16**(4): 545 – 546.

Kossanel, J.P.; Martin, J.; Annelle, P.; Peinot, M.; Vallet, J.K. and Kurnej, K. (1977). Inhibition of growth of young radicles of maize by exudation in culture solution and extract of ground roots of *Chemopodium album* L. in Interactions of plants and micro organisms in Phtocenses. Vol. 4, pp 77 – 86. Naukova Dumka, Kiev.

Loveys, B.R. and Wareing, P.F. (1971a). The red light controlled production of gibberellin in etiolated wheat leaves. *Planta,* **98**: 109 – 116.

Pandya, S.M. (1975). Effect of *Celosia argenitea* extracts on root and shot growth of bajra seedlings. *Geobios*, **2**: 175 - 178.

Prodo, F.E.; Boero, C.; Gallado, M. and Gonzale, J.A. (2000). Effect of Nacl on germination, growth and soluble sugar content in *Chenopadium guinoa*. *Wild Seeds Bot. Eull Acad Sin*, **41**: 21 – 34.

Skene, K.G.M. and Carr, D.J. (1961). A quantitative study of the gibberellin contents of seeds of *Phaseolus vulgaris* at different stages in their development. *Aust. J. Biol. Sci*., **14**: 13 – 25.

Srivastava, A.K. and Sareen, K. (1972). Germination of soyabean seeds as affected by differential storage conditions. *Bull. Grain Technol*., **10**: 390 – 396.

Thuy, N.X.; Chauhdary, M.A. and Hampton, J.G. (2007). The effects of high drying temperatures and tempering on development of stress cracks and germination of maize seeds. (*Zea mays* L). *J. Seed Science and Technology*, **27**: 507 – 515.

Yamamoto, M. (1957). On the germination of bean seeds (*Phaseolus*) during soaking in water. *Japanese Jour. Ecol*., **7**: 120 - 123.