

Effect of Inoculation of Arbuscular Mycorrhizal Fungi on ‘P’ Uptake and N Content Activity in *Tephrosia purpurea* (L.) Pers.

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Abstract: *Tephrosia purpurea* (L.) Pers belongs to family fabaceae studied for their association of Arbuscular Mycorrhizal fungi. Test plant was grown in permanently drought prone area of Man Tahasil (Dahiwadi) from Satara District of Maharashtra India. The present study deals with the effect of inoculation of Arbuscular Mycorrhizal fungi on Nitrogen content and uptake of Phosphorus in *Tephrosia purpurea*. Inoculation of Arbuscular Mycorrhizal fungi attributed a significant increase in Nitrogen content and Uptake of Phosphorus at 90 and 135 days Plant. The increase in Nitrogen content and uptake of Phosphorus were recorded with inoculation of *Acaulospora delicata* compare to *Glomus geosporum*, *Glomus fasciculatum*, *Glomus dimorphicum* over uninoculated control.

Keywords: *Tephrosia purpurea* (L). Arbuscular Mycorrhizal fungi, *Acaulospora delicata*, Nitrogen, Phosphorus

REFERENCES

- [1]. B. Mosse, (1973) Advances in the study of vesicular-arbuscular mycorrhiza. Ann. Rev. Phytopathology, 11, 171-196.
- [2]. D. J. Bagyaraj (2007). Arbuscular mycorrhizal fungi and their role in Horticulture. In: Recent trends in horticultural biotechnology. Keshavchandran et al. (Eds.), p. p: 53-58
- [3]. D. J. Bagyaraj, (1986). Mycorrhizal association in crop plants and their utilization in agriculture. In: Beneficial fungi and their utilization. Nair, M.C. and Balakrishnan, S. (eds), Scientific Publ. Jodhpur, India, Pp. 59 72.
- [4]. D. J. Bagyaraj, (2006). Arbuscular mycorrhizal fungi in sustainable agriculture. In: Techniques in Mycorrhizae Eds. Bukhari, M.J., and B.F. Rodrigues, Department of Botany. Govt. College. Quepem, Goa- India. pp. 1-8.
- [5]. D. S. Hayman, 1982. Practical aspects of VAM. In: Advances in agricultural microbiology. Subba Rao, N.S. (Ed). New Delhi Oxford, IBA, Pp. - 325 373. Powell, C.L.,
- [6]. E. A. Salam, A. Alatar, M. A. El-Sheikh, (2017). Inoculation with arbuscular mycorrhizal fungi alleviates harmful effects of drought stress on damask rose. Saudi J. Biol. Sci. 25 (8), 1772–1780. doi: 10.1016/j.sjbs.2017.10.015
- [7]. E. Sieverding, (1998). Should VAM inocula for cassava contain single or several fungal species? Proceedings of 2nd European symposium on mycorrhizae. Czechoslovakia: pp 98.
- [8]. Endomycorrhizas. Academic Press, London, pp 495-509
- [9]. H. C. Lakshman, (2012). Techniques in mycorrhizal studies. In: Glimpses of Arbuscular Mycorrhiza Fungal Research. LAMBERT Academic Publishing, Germany. pp 5-14.
- [10]. Koomen, C. Grace, D. S. Hayman, (1987). Effectiveness of single and multiple mycorrhizal inoculations: growth of clover and strawberry plants at two soil pH. Soil Biology and Biochemistry 19 (5), pp 539- 544.

- [11]. INVAM (2018) International culture collection of (vesicular) arbuscular mycorrhizal fungi. West Virginia University, Morgantown
- [12]. J. M. Barea and P. Jefffferies (1995). Arbuscular mycorrhizas in sustainable soil plant systems. In: B Hock and A. Verma (eds) Mycorrhiza, structure, Functions, Molecular Biology and biotechnology. Springer-Verlag, Heidelberg 521-559.
- [13]. J. M. Trappe, (1987). Phylogenetic and ecologic aspects of mycotrophy in the Angiosperms from an evolutionary standpoint. In: *Ecophysiology of VA Mycorrhizal Plants* (Ed. By G. R. Safir). pp 5-25. CRC Press, Boca Raton, Florida
- [14]. J. M. Trappe. (1987). Phylogenetic and ecologic aspects of mycotrophy in the Angiosperms from an evolutionary standpoint. In: *Ecophysiology of VA Mycorrhizal Plants* (Ed. By G. R. Safir). pp 5-25. CRC Press, Boca Raton, Florida.
- [15]. J. W. Gerdemann 1968. Vesicular arbuscular mycorrhiza and plant growth. Annu. Rev. Phytopathol. 6: 397-418
- [16]. J.W. Gerdemann, T.H. Nicolson, 1963. Spores of mycorrhizal Endogone species extracted from soil by wet sieving and decanting. Trans. Br. Mycol. Soc., 46: 235 246.
- [17]. Lakshman, H. C. (2009). AM Fungi with rhizosphere soil influence on Jatropha curcas L. Int. J. Plant Sci.1(1), pp 120-123.
- [18]. Lakshman, H. C. (2012). Techniques in mycorrhizal studies. In: *Glimpses of Arbuscular Mycorrhiza Fungal Research*. LAMBERT Academic Publishing, Germany. pp 5-14.
- [19]. M. A. Ahanger, S. R. Tyagi M. R. Wani, P. Ahmad (2014). "Drought tolerance: role of organic osmolytes, growth regulators, and mineral nutrients," in *Physiological mechanisms and adaptation strategies in plants under changing environment*, vol. 1 . Eds. Ahmad P., Wani MR. (New York, NY: Springer;), 25–55. 10.1007/978-1-4614-8591-9_2 [CrossRef] [Google Scholar]
- [20]. M. L. Jackson, (1973). Soil Chemical Analysis, Prentice Hall of India Pvt, Ltd. New Delhi.
- [21]. N. B. Mane, C. J. Khilare and Y. T. Shinde. (2016). Influence of arbuscular mycorrhizae on growth of *Tephrosia purpurea* (L.) pers. international journal of researches in biosciences, agriculture and technology © vishwashanti multipurpose society (Global Peace Multipurpose Society) R. No. MH-659/13(N). Vol. 4 (1), Jan 2016: 198-200
- [22]. N. B. Mane, D. D. Namdas and C. J. Khilare (2013). Studies on AM fungi in *Withania somnifera* (L.) Dunal. Proceeding of National conference on "Plant biotechnology for Agriculture Development and Human Welfare. P.P.66.
- [23]. R. J. Rodriguez, J. Van Volkenburgh Henson, E., Hoy, M., Wright, L., Beckwith, F., et al. (2008). Stress tolerance in plants via habitat-adapted symbiosis. Int. Soc. Microb. Ecol. 2, 404–416. doi: 10.1038/ismej.2007.106
- [24]. S. B. Gurumurthy, and M. N. Sreenivasa, (1996). Response of Chilli to different inoculum levels of *Glomus macrocarpum* in two soil types of Karnataka. Karnataka Journal of Agricultural Sciences, 9, pp 154-159
- [25]. Y. Rouphael P. Franken C., D., Schneider Schwarz, M. Giovannetti, M. Agnolucci. (2015). Arbuscular mycorrhizal fungi act as bio-stimulants in horticultural crops. Sci. Hort. 196, 91–108. 10.1016/j.scienta.2015.09.002

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