

THE AM (ARBUSCULAR MYCORRHIZAL) FUNGI, A NEW BIOLOGICAL TOOL

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Abstract: The AM Fungi has emerged as a new biological tool. An arbuscular mycorrhiza (plural mycorrhizae or mycorrhizas) is a type of mycorrhiza in which the fungus penetrates the cortical cells of the roots of a vascular plant. Arbuscular mycorrhizae (AMs) are characterized by the formation of unique structures such as arbuscules and vesicles by fungi of the phylum Glomero-mycota (AM fungi). AM fungi (AMF) help plants to absorb nutrients such as phosphorus and micronutrients from the soil. It is believed that the development of the arbuscular mycorrhizal symbiosis played a crucial role in the initial colonisation of land by plants and in the evolution of the vascular plants (Brundrett, 2002).

Keywords: AM Fungi, VAM Fungi, Arbuscules, Phosphorus uptake, Derived benefits.

REFERENCES

- Bagyaraj, D.J. and B.J.D. Reddy** (2000). Arbuscular mycorrhizas in sustainable agriculture, pp 43-53. In: Rajak RC (Eds.) Microbial biotechnology for sustainable development and productivity. Scientific publishers, Jodhpur, India.
- Bolan, N.S.** (1991). A critical review of the role of mycorrhizal fungi in the uptake of phosphorus by plants. *Plant and Soil.* **134**: 189–207.
- Brundrett, M.C.** (2002). Coevolution of roots and mycorrhizas of land plants. *New Phytol.* **154**: 275–304.
- Bücking, H., Shachar-Hill Y.** (2005). Phosphate uptake, transport and transfer by arbuscular mycorrhizal fungus is increased by carbohydrate availability. *New Phytol.* **165** (3): 889–912.
- Fitter, A.H.** (1988). Water relations of red clover, *Trifolium pratense* L., as affected by VA mycorrhizal infection and phosphorus supply before and during drought. *J. Exper. Bot.* **39**: 595–604.
- George, E.; Haussler, K.; Kothari, S.K.; Li, X.L. and H. Marshner.** (1992). Contribution of Mycorrhizal Hyphae to Nutrient and Water Uptake of Plants. In Mycorrhizas in Ecosystems, ed., D.J. Read, D.H. Lewis, A.H. Fitter, I.J. Alexander. United Kingdom: C.A.B. International, pp. 42-47.
- Grant, C. Bitman, Montreal, S., Plenchette, M., Morel, C.** Soil and fertilizer phosphorus: effects on plant supply and mycorrhizal development. *Can. J. of Pl. Sci.* **85**: 3–14.
- Hamel, C.** Impact of arbuscular mycorrhiza fungi on N and P cycling in the root zone. *Can. J. of Soil Sci.* **84**: 383–395.
- Harley, J.L., Smith, S.E.** (1983). Mycorrhizal Symbiosis. Academic Press: London.
- Hooker, J. E., Jaizme-Vega, M., Atkinson, D.** (1994). Biocontrol of plant pathogens using arbuscular mycorrhizal fungi. In: Gianinazzi, S., Schüepp, H., eds. Impact of Arbuscular Mycorrhizas on Sustainable Agriculture and Natural Ecosystems. Basel, Switzerland: Birkhäuser Verlag. p 191–200.
- Jeffries, P., Gianinazzi, S., Perotto, S., Turnau, K., Barea, J.** (2003). The Contribution of arbuscular mycorrhizal fungi in sustainable maintenance of plant health and soil fertility. *Biol. and Fertil. of Soils.* **37**: 1–16.
- Kosuta, S.; Chabaud, M.; Lougnon, G.; Gough, C.; Denarie, J.; Barker, D.; Bacard, G.** (2003). A diffusible factor from arbuscular mycorrhizal fungi induces symbiosis-specific mtENOD11 expression in roots of *Medicago truncatula*. *Pl. Physiol.* **131**(3): 952–962.
- Pfeffer, P.; Douds D.; Becard, G.; Shachar-Hill, Y.** (1999). Carbon uptake and the metabolism and transport of lipids in an arbuscular mycorrhiza. *Pl. Physiol.* **120**(2): 587–598.

- Schüßler, A. et al.** (2001). A new fungal phylum, the Glomeromycota: phylogeny and evolution *Mycol. Res.* **105** (12): 1416.
- Simon, L.; Bousquet, J.; Levesque, C.; Lalonde, M.** (1993). Origin and diversification of endomycorrhizal fungi and coincidence with vascular land plants. *Nature*. **363**: 67–69.
- Smith, S. Smith, A. Jakobsen, I.** (2003). Mycorrhizal fungi can dominate phosphorus supply to plant irrespective of growth response. *Pl. Physiol.* **133** (1): 16–20.
- Thingstrup, I., G. Rubæk, E. Sibbensen and I. Jakobsen** (1999). Flax (*Linum usitatissimum* L.) depends on arbuscular mycorrhizal fungi for growth and P uptake at intermediate but not high soil P levels in the field. *Plant and Soil*. **203**: 37–46.
- Xie, Z., Staehelin, C., Vierheilig, H., Weimken, A., Jabbouri, S., Broughton W., Vogeli-Lange, R., Thomas B.** (1995). Rhizobial Nodulation Factors Stimulate Mycorrhizal Colonization of Nodulating and Nonnodulating Soybeans. *Pl. Physiol.* **108**(4): 1519–1525.