

PISOLITHUS TINCTORIUS, A NEW RECORD FROM PAKISTAN

ABDUL RAZZAQ AND SALEEM SHAHZAD

*Pest & Disease Research Lab.,
Department of Botany, University of Karachi, Karachi-75270, Pakistan.*

Abstract

Pisolithus tinctorius is recorded for the first time from Karachi, Pakistan. This species is characterized by production of brown, spiny spores, 8.8 µm in diam., excluding spines which are up to 1 µm in length. Sporocarps of the fungus were collected during summer from the sandy soil, mostly around the root zone of *Eucalyptus* trees growing in Karachi University Campus.

Pisolithus is a Basidiomycotous fungus that belongs to the family Sclerodermataceae of the order Sclerodermatales. The genus is characterized by fruiting body with variable shape and size often with well developed rooting base. During a survey of Basidiomycetes in Pakistan, specimens of puff ball collected from Karachi were identified as *Pisolithus tinctorius* (Pers.) Desv., after reference to Demoulin & Marriott (1981) and Surček (1988). A description of the species is given herein.

***Pisolithus tinctorius* (Pers.) Coker & Couch, *Gasterom. East. US & Canada*: 170; 1928.
(Fig. 1)**

Sporocarp globular, 6-12cm high, bearing a short, sterile, stem like, deeply rooted base that is 5-12 cm in length. Initially the fruiting body is white but the colour gradually changes and becomes brown to black. The peridium is soft and simple in early stages of growth but gradually becomes hard with the age. The peridium encloses several pea-sized compartments called peridioles. The peridioles near the top enlarge and break open to give coloured powdery gleba. The age of peridioles decreases as distance from the mature layers increases. Gleba is smoky or dark grey in color that becomes dark when changes into powdery form. There is no capillition. Peridium splits irregularly from upper side of the body. Spores are globose to sub-globose, spiny, thick walled, brown in colour, 5-10 (av. 8.8) µm in diam. Spines up to 1 µm in length.

P. tinctorius appears to be a new record from Pakistan not hitherto reported (Mirza & Qureshi, 1978; Ahmad *et al.*, 1997). During the present studies, the specimens were collected mostly from the sandy soil during the summer season. The fruiting bodies were often found near the root zone of *Eucalyptus* trees in Karachi University Campus. It is interesting to note that *P. tinctorius* is known to form mycorrhizal association with several trees (Marx, 1979; Pederson *et al.*, 1999) including *Eucalyptus* (Ashford *et al.*, 1999). Two antibiotic compounds viz., p-hydroxybenzoylformic acid [2-(4'-hydroxyphenyl)-2-oxoethanoic acid, pisolithin A] and (R)-(-)-p-hydroxymandelic acid [(R)-(-)-2-(4'-hydroxyphenyl)-2-hydroxyethanoic acid, pisolithin B] isolated from the growth culture of *Pisolithus tinctorius* were shown to inhibit spore germination and cause hyphal lysis to a significant number of phytopathogenic and dermatogenic fungi (Tsantrizos *et al.*, 1991). Furthermore, the fungus is also a good source of dye that are used to color the wool, whereas, young fruiting bodies of *P. tinctorius* are edible in small amount (Surček, 1988). The possible horticultural or industrial use of *P. tinctorius* in Pakistan needs elucidation.

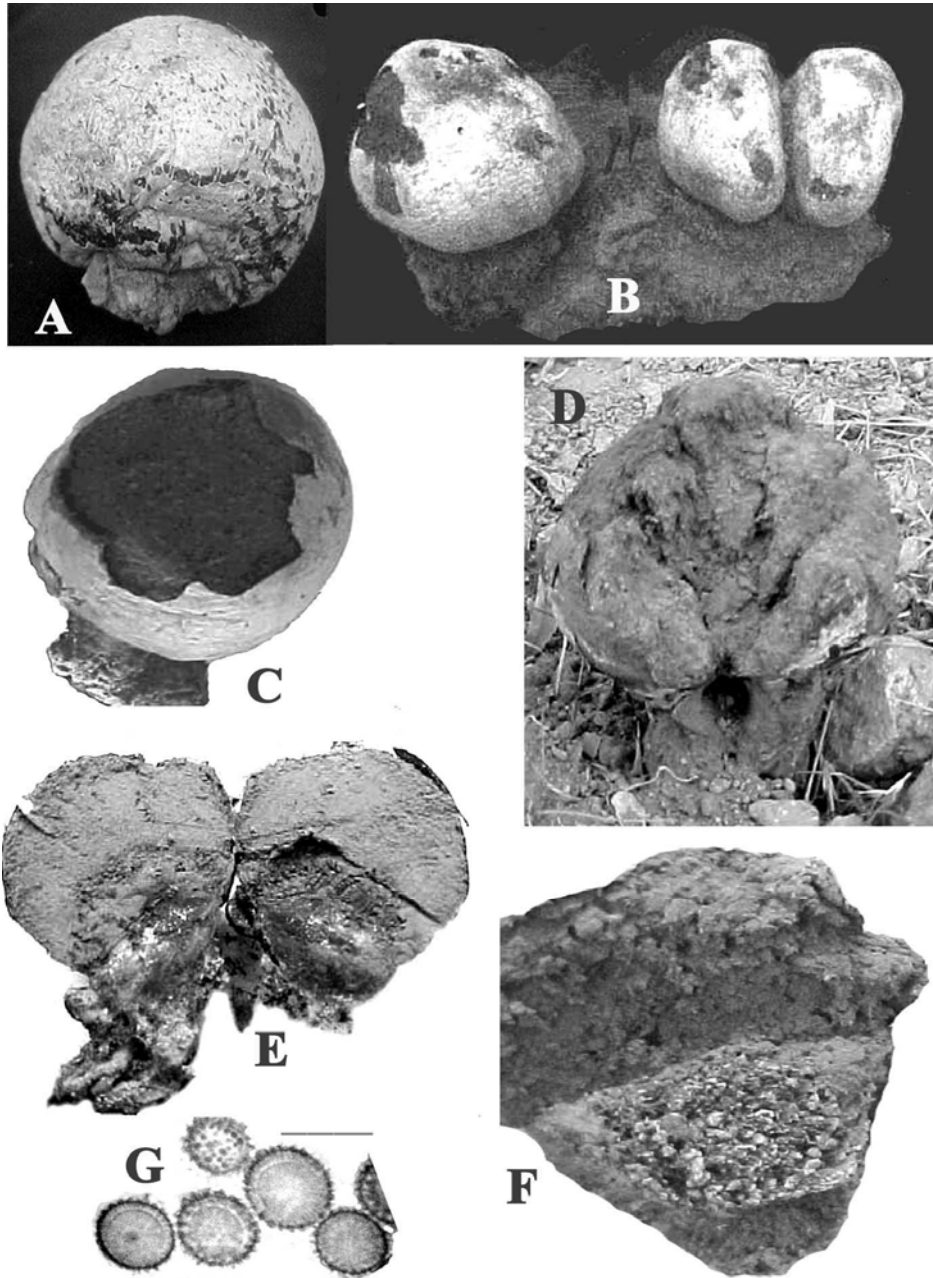


Fig. 1. A & B. Fruiting bodies of *Pisolithus tinctoriu*. C & D, Stalked fruiting bodies with a part of peridium removed to show the glebba. E & F. L.S. of the fruiting body showing glebba and peridioles. G. Spherical spiny spores of *P. tinctorius* (bar= 10 μ m).

References

- Ahmad, S., S.H. Iqbal and A.N. Khalid. 1997. *Fungi of Pakistan*. Sultan Ahmad Mycological Society of Pakistan, Department of Botany, University of the Punjab, Quaid-e-Azam campus, Lahore 54590, Pakistan.
- Ashford, A.E; P.A. Vesk, D.A. Orlovich, A.L. Markovina and W.G. Allaway. 1999. Dispersed polyphosphate in fungal vacuoles in *Eucalyptus pilularis/Pisolithus tinctorius* ectomycorrhizas. *Fungal Genet. Biol.*, 28(1): 21-33.
- Christian, T.P., D.M. Sylvia and D.G. Shilling. 1999. *Pisolithus arhizus* ectomycorrhiza affects plant competition for phosphorus between *Pinus elliottii* and *Panicum chamaelonche*. *Mycorrhiza*, 9: 199-204.
- Demoulin, V. and J.V.R. Mriott. 1981. Key to the Gasteromycetes of Great Britain. *Bull. Brit. Mycol. Soc.*, 15(1): 37-43.
- Marx, D.H. 1979. *Pisolithus tinctorius*, ectomycorrhizeae improve survival and growth of pine seedlings on acid coal spoils in Kentucky and Virginia. *The Reclamation Review*, 2: 23-31.
- Mirza, J.H. and M.A.R. Qureshi. 1978. *Fungi of Pakistan*. Department of Plant Pathology, University of Agriculture, Faisalabad, Pakistan.
- Surček, M. 1988. *The Illustrated Book of Mushrooms and Fungi*. The Octopus Publishing Group, Michelin House, 81 Fulham Road, London.
- Tsantrizos, Y.S., H.H. Kope, J.A. Fortin and K.K. Ogilvie. 1991. Antifungal antibiotics from *Pisolithus tinctorius*. *Phytochemistry*, 30(4): 1113-1118.

(Received for publication 20 April 2004)