



## *Suillus triacicularis* sp. nov., a new species associated with *Pinus roxburghii* from northwestern Himalayas, India

BALWANT VERMA & M. SUDHAKARA REDDY\*

Department of Biotechnology, Thapar University, Patiala-147004, Punjab, India  
Email: msreddy@thapar.edu

### Abstract

A new *Suillus* species, *Suillus triacicularis* sp. nov., is reported from northwestern Himalayan region of India. This is the first report of any *Suillus* species found in ectomycorrhizal association with *Pinus roxburghii* in this region. Morphologically, the species is very close to *Suillus granulatus* but can be distinguished mainly by the yellow to reddish or orange-yellow pileus color at maturity and the absence of watery green context next to the tubes. Phylogenetic analysis of internal transcribed spacer region revealed that this species is distinct from other closely related species of *Suillus*. Field photographs of fresh sporocarps, microscopic line drawings, and a phylogenetic tree are provided along with the taxonomic details.

**Key words:** Boletales, ectomycorrhizal, ITS, phylogeny, *Suillaceae*, taxonomy

### Introduction

The genus *Suillus* was founded by S.F. Gray in Gray (1821: 646) and about 50 different species have been reported worldwide (Kirk *et al.* 2008). *Suillus* species are common root symbionts of the family *Pinaceae* (Kretzer *et al.* 1996, Wu *et al.* 2000) and have been reported by many authors (Timonen *et al.* 1997, Wallander 2000, González-Ochoa *et al.* 2003, Beatriz *et al.* 2006) to enhance pine growth, survival and nutrient uptake. The pioneer work on documenting *Suillus* diversity was done by Smith & Thiers (1964). Thereafter, several other investigations on diversity and evolutionary phylogenetics of *Suillus* species from different parts of the world have been reported (Corner 1972, Thiers 1979, Kretzer *et al.* 1996, Kretzer & Bruns 1997, Wu *et al.* 2000, Manian *et al.* 2001, Beatriz *et al.* 2006, Feng *et al.* 2008). Recently, a new *Suillus* species, *S. quiescens* T.D. Bruns & Vellinga in Bruns *et al.* (2010: 442), was described from California and Oregon. Very little is known about *Suillus* diversity from the Himalayan region of India. *Suillus sibiricus* (Singer) Singer (1945: 260) and *Suillus granulatus* (L.) Roussel in Roussel (1796: 34) have been reported from Himachal Pradesh and Jammu & Kashmir states of India, respectively (Sagar & Lakhanpal 2005, Dar *et al.* 2010). During our field surveys in northwestern Himalayas (2009–2013), both these *Suillus* species were found associated mainly with *Pinus wallichiana* A.B. Jacks. in Jackson (1938: 85) and seldom with *Cedrus deodara* (Roxb. ex D. Don) G. Don in Loudon (1830: 388). So far, there is no record for any *Suillus* species colonizing *Pinus roxburghii* Sarg. in Sargent (1897: 9).

*Pinus roxburghii*, commonly known as Chir pine, is a pine native to the Himalayas. It is found at low elevations ranging from 450–2300 m, extending longitudinally from 71°–93°E and latitudinally from 26°–36°N, and is distributed over an area of 8900 sq. km in India (Arya *et al.* 2000, Sharma & Lekha 2013). In general they develop as pure stands, but often form mixed stands with other species especially at their outer limits. Chir pine is an extensively used pine species for afforestation programmes due to its traditional, medicinal, and industrial utilities. Considering the commercial plantations and afforestation of Chir pine, the ectomycorrhizal community associated with the pine is also of utmost importance and needs to be documented and conserved. In the present study, we describe a new and rare *Suillus* species from Chir pine forests in northwestern Himalayas that was found fruiting exclusively in association with *P. roxburghii* trees. Morphological examination and phylogenetic analysis

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