

SOME HIGHER FUNGI FROM SAGARMATHA NATIONAL PARK (SNP) AND ITS ADJOINING AREAS, NEPAL

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Abstract: The present paper includes a list of 69 species of wild mushrooms collected from Sagarmatha National Park (SNP) and its adjoining areas, which are recorded for the first time from this area.

Key words: Mushrooms; Mixed forest; Khumbu region.

INTRODUCTION

The investigation and study on mushrooms of Nepal started since the period of J.D Hooker (1848-1850), from which Berkeley (1854) described 44 species of higher fungi. Since then many authors like Balfour and Browne (1955 & 68); Imazeki *et al.* (1966); Kreisel (1969 & 1976); Singh *et al.* (1977/78); Pandey (1976); Adhikari (1976, 1984, 1987, 1988abc, 1990, 1991, 1996ab, 1999ab, 2000, 2001); Adhikari and Manandar (1986, 1996, 1997, 1998, 2004ab); Ryvardeen (1977); Adhikari 7 Parajuli (1993, 1996); Bhandary (1984 & 1991); Otani (1982); Hjortstam *et al.* (1984); Cotter (1987); Pandey (1976); Pandey & Budathoki (2003) and Devkota *et al.* (2005) have contributed their knowledge on Nepalese mycoflora.

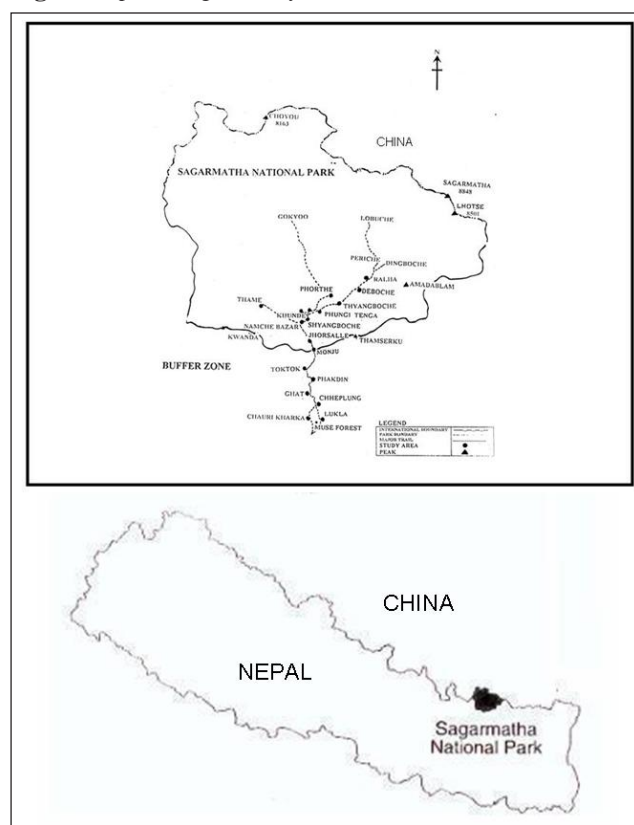
STUDY AREA

The study area lies in Solu-Khumbu district of the northeastern region of Nepal. It encompasses the Sagarmatha National Park (1148 sq. km) and its Buffer Zone area (275 sq. km) (Fig. 1). The Park includes the upper catchments areas of the Dudh Kosi and Bhote Kosi Rivers. Due to its altitudinal diversity, various type of vegetation is found in different climatic zones (temperate, subalpine, alpine, nival and permanent snow zones). The dominant vegetation at the lower elevation of the park below 3000 meter above sea level (msl.) is composed mostly of blue pine and Hemlock forest. The lower subalpine region above 3000 msl. comprises *Pinus walliachana*, *Abies spectabilis* and *Juniperus recurva* forests. The upper subalpine, above 3600 msl. consists of Birch - Rhododendron forest (*Betula utilis*, *Rhododendron campanulatum* and *R. campylocarpum*) and the lower alpine region above the timber-line at 3800-4000 msl. houses scrubs (*Juniperus* spp, *R. anthopogan* & *R. lepidotum*).

MATERIALS AND METHODS

The mushroom specimens were collected from Lukla (2,800 msl.) to Pangboche (4,000 msl.) during the month of August

Fig. 1: Map showing the study area.



to September 2004. The mushroom specimens were collected by carefully digging them with the help of a sharp knife. Data on habit and habitat such as ecological parameters such as altitude forest type, etc. were recorded in the field. The collected mushroom specimens were photographed in their natural habitat before they were picked up. Each collection was placed in butter paper bags and tag numbers were assigned to them. The morphological characters such as spore print and colour, habitat, forest type, pileus and tube colour, colour change induced after bruising or cutting and exposing

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to chemicals such as potassium hydroxide (KOH), Ferrous sulphate (FeSO₄) were noted. The specimens were either sun dried or dried by placing them on tin foil over a local oven. Dried specimens were placed in butter paper bags. Naphthalene balls were used as insect repellents. The dried specimens were identified in the laboratory with the help of standard literatures (Adhikari, 2000; Imazeki, Otani & Hongo, 1979; Purukayastha & Chandra, 1985; Svreck, 1975; McKenny, 1971; Mcknight & Mcknight, 1987) and studying macro and microscopic characters. The specimens are housed in Nepal Academy of Science and Technology (NAST), Khumaltar.

Enumeration of species

A total of 150 mushrooms specimens belonging to 37 families and 65 genera were collected from Lukla to Pangboche. Out of the collected specimens expect five species, all were identified upto the generic level and 69 were identified upto species level. The identified 69 species are enumerated as follows.

Agariaceae

1. *Agaricus xanthoderma* Genevier

Growing on soil in shady places, under *Pinus* forest, Phungi tenga, 3255m, 26.8.2004;

Rana, Giri & Shrestha, no. 583, NAST.

Distribution: Ireland, Africa, Nepal.

Amanitaceae

2. *Amanita hemibapha* (Berk. & Br.) Sacc.

On moist soil, under mixed forest of *Rhododendron* and *Tsuga*, Muse Forest, Lukla, 2783m, 13.8.2004; Rana, Giri & Shrestha, no. 20, NAST.

Previously recorded from Manichur; Suryabinayak, Dakshinkali, Kakani, Nagarkot; Brajayoginin and Kathmandu valley ((Adhikari, 1976-1996a) and amongst grasses under tree, Sundarijal (Singh & Nisha, 1976a) (Pandey, 1976).

Distribution: Japan, Malaysia, Singapore, Borneo, Java, Nepal.

3. *Amanita gemmata* (Fr.) Gill.

[= *Amanita junquillea* Quel.; *Amanitopsis adnata* (W.G. Smith) Sacc.]

Growing on dry soil in open area, Namche, 3065m, 16.8.2004; Giri, Rana & Shrestha, no. 129, NAST.

Distribution: Japan, Europe, America, Nepal.

4. *Amanita vaginata* (Bull.: Fr.) Vitt.

[= *Amanitopsis vaginata* (Bull.) Roxb.]

Growing on moist soil, under *Tsuga* and *Rhododendron* forest, Muse Forest, Lukla, 2783m, 13.8.2004; Rana, Giri & Shrestha, no. 21, NAST.

Previously recorded from Manichur; Suryabinayak; Dakshinkali; Kakani; Nagarkot; Brajayogini ; Kathmandu valley (Adhikari, 1976- 1996a) and amongst grasses under tree, Sudarijal (Singh & Nisha, 1976a) (Pandey, 1976).

Distribution: Australia, Europe, North America, Japan, India, China, Nepal.

5. *Amanita pachycolea* (Bull.: Fr.) Vitt

On moist soil, under *Rhododendron* Forest, Debuche, 3700m, 24.8.2004; Rana, Giri & Shrestha, no.450, NAST.

Distribution: Japan, Europe, Nepal.

Auriculariaceae

6. *Auricularia polytricha* (Mont.) Sacc.

Growing on moist soil under *Pine* forest, Khumjung, 3800m, 22.8.2004; Rana, Giri & Shrestha, no. 258, NAST.

On tree branch, Tamrang khola (Balfour-Browne, 1968).

Distribution: World wide.

Boletaceae

7. *Boletus auripes* Peck

Growing on moist soil, under *Rhododendron* & *Quercus* forest, Muse Forest, Lukla, 2783m 13.8. 2004; Rana, Giri & Shrestha, no. 33, NAST.

Distribution: North America, Japan, Nepal.

8. *Boletus edulis* Bull.: Fr.

Growing on moist soil, under mixed forest of *Pinus* and *Tsuga*, Muse Forest, Lukla, 2783m, 13.8. 2004; Giri, Rana & Shrestha, no. 10I, NAST.

Previously recorded form Kakani (Pandey, 1976); Syabru (Cotter, 1987) and Suryavinayak (Adhikari *et al.* 1996).

Distribution: Worldwide.

9. *Boletus pulverulentus* Opat.

Growing on moist soil, under mixed forest of *Rhododendron* sp. and *Tsuga* sp., Muse Forest, Lukla, 2783m, 13.8.2004; Rana, Giri & Shrestha, no. 22, NAST.

Distribution: Taiwan, North America, Europe, Nepal.

10. *Boletinus asiaticus* Sing.

Growing on moist soil, in *Pinus* forest, Tok Tok, 2725m, 15.8.2004; Rana, Giri & Shrestha, no. 84, NAST.

Distribution: Japan, China, North America, Taiwan, Nepal.

11. *Boletinus cavipes* (Klotz.: Fr) Kalchbr.

Growing on moist soil associated with mosses, under *Pinus* forest, Phakdin, 2500m, 14.8.2004; Rana, Giri & Shrestha, no. 70, NAST.

Place not mentioned (Singh, 1966).

Distribution: Europe, Japan, China, North America, India, Nepal.

12. *Gyrodon meruloides* (Schw.) Sing.

Growing on moist soil in open place near to *Rhododendron* – *Quercus* forest, Muse forest, Lukla, 2783m, 13.8.2004; Giri, Rana & Shrestha, no. 32, NAST.

Distribution: Europe, North America, Australia, South Africa, Nepal.

13. *Phylloporus bellus* (Mass.) Corner

Growing on dry soil at steep wall under Coniferous forest, Lukla/Ghat, 2604m, 14.8.2004; Giri, Rana & Shrestha, no. 42, NAST.

Distribution: Japan, Malaysia, Singapore, Nepal.

14. *Pulverboletus ravenelli* (Berkeley & Curtis) Murrill

Growing on moist soil under Coniferous forest, Lukla/Ghat 2604m, 14.8.2004; Rana, Giri & Shrestha, no. 43, NAST.

Distribution: Europe, North America, South America, Nepal.

15. *Suillus placidus* (Bonord.) Singer

Growing on moist soil under *Pinus - Daphnea* forest, Namche, 3150m, 16.8.2004; Rana, Giri & Shrestha, no. 128, NAST.

In pine forest, Chautara, Daman, Nagarkot and Syabru (Cotter, 1987).

Distribution: Europe, North America, Japan, Nepal.

16. *Suillus sibiricus* (Singer) Singer

Growing on rocky soil in open area, near to *Pinus* forest, way to Namche, 3150m, 16.8.2004; Giri, Rana & Shrestha, no. 130, NAST.

In Pine forest, Ghassa, Godavary, Kakani, Larjung, Lete, Syabru (Cotter, 1987) and Pisang (Bhandary, 1991).

Distribution: Europe, Japan, Nepal.

17. *Tylopilus alboater* (Peck) Sing.

Growing on steep wall on moist soil, under Coniferous forest, between Lukla to Ghat, 2604m, 14.8.2004; Giri, Rana & Shrestha, no. 50, NAST.

Distribution: East Asia, North America, Europe, Nepal.

18. *Tylopilus eximus* (Peck) Sing.

Growing on moist soil, under pure *Rhododendron* forest, Jami khiau, 3825m, 22.8.2004; Giri, Rana & Shrestha, no. 270, NAST.

Distribution: East Asia, Costa Rica, North America, Europe, Nepal.

Cantharellaceae

19. *Cantharellus cibarius* (Fr.: Fr) Fr.

Growing on moist soil, in *Rhododendron* forest, Khunde, 3900m, 20.8.2004; Rana, Giri & Shrestha, no. 237, NAST.

In *Pinus roxburghii* forest, on soil, Bajrajogini (Manichur) (Adhakari, 1976); Manang (Bhandari, 1991); Sudarijal and Kathmandu market (Adhikari, 1996a and Adhikari *et al.* 1996) and on soil in *Pinus roxburghii* forest, Lumle (Devkota, 2005).

Distribution: Worldwide.

Clavariaceae

20. *Clavaria acuta* Sch.: Fr.

Growing on moist soil, under *Abies* forest, Phurte, 3585m, 17.8.2004; Giri, Rana & Shrestha, no. 210, NAST.

On soil in *Castanopsis* forest, Godavary (Adhakari, 1988b); in mixed forest, Suryavinayak and Sundarijal (Adhakari, 1996; Adhikari, *et al.*, 1996) and on soil of *Rhododendron arboreum*, Bhirmoni, Lumle (Devkota, 2005).

Distribution: Europe, Australia, North America, USSR, Japan, India, Nepal.

Clavulinaceae

21. *Clavulina cinerea* (Bull.:Fr.) Schroet.

(= *Clavaria cinerea* Fr.)

Growing on moist soil, Jami khiau forest, Khumjung, 3825m, 22.8.2004; Giri, Rana and Shrestha, no. 268, NAST.

On ground, Godavary (Pandey, 1976) and Kathmandu market (Adhikari, 1996; Adhikari, 1997; Adhikari *et al.*, 1996).

Distribution: Europe, North America, Japan, India, Nepal.

Coprinaceae

22. *Coprinus micaceus* (Bull.: Fr.) Fr.

(= *Coprinellus micaceus* (Bull.: Fr.) Vil., Hop. & John.

Growing on moist soil and dead tree trunk open area near *Rhododendron* and *Abies* forest, Tengboche, 3702m, 24.8.2004; Rana, Giri & Shrestha, no. 410, NAST.

Distribution: Worldwide.

23. *Coprinus niveus* (Pers.) Fr

Growing on moist soil in open area near *Pinus* forest, Tengboche, 3445m, 26.8.2004; Rana, Giri & Shrestha, no. 579, NAST.

Distribution: America, Europe, Nepal.

24. *Coprinus radians* (Desm.: Fr.) Fr.

Growing on twig of *Rhododendron* sp., Jami khiau forest, 3860m, 22.8.2004; Giri, Rana & Shrestha, no.279, NAST.

Distribution: Europe, America, Japan, Nepal.

Cortinariaceae

25. *Cortinarius traganus* (Fr.: Fr.) Fr.

Growing on moist soil, under *Rhododendron* Forest, Omaka Forest (Pangboche), 3890m, 25.8.2004; Giri, Rana & Shrestha, no. 552, NAST.

Distribution: North America, Europe, Nepal.

26. *Dermocybe phoenicea* (Bull.) Moser

Growing on moist soil, under *Rhododendron* & *Abies* mixed forest, Khumjung, 3800m, 22.8.2004; Giri, Rana & Shrestha, no. 261, NAST.

Distribution: Japan, Europe, Nepal.

Fomitopsidaceae

27. *Gloeophyllum sepiarium* (Wolf.: Fr.) Karst.

(= *Lenzites sepiaria* Wolf.: Fr.)

Growing on *Pine* root, *Pinus* forest, Jorsalle, 2690m, 15.8.2004; Rana, Giri & Shrestha, no. 100, NAST.

Previously recorded from Hetauda (Pandey, 1976).

Distribution: Europe, Japan, China, North America, India, Nepal

Ganodermataceae

28. *Ganoderma applanatum* (Pers.) Pat.

Growing on dead log of *Abies*, Lausasa 3570m, 23.8.2004; Rana, Giri & Shrestha, no. 312, NAST.

On rotten tree, Terai forest, Dharan (Balfour-Browne, 1968); on rotten tree trunk, Bakhri Kharka (north of Pokhara); Taglung (Kaligandaki) (Balfour-Browne, 1968); Hetauda (Pandey, 1976); on *Quercus* sp., Daman (Singh 1976); on stump, Phulchoki (Lalitpur Dist.) (Singh & Nisha, 1976c); on tree trunk, Namrung (Gorkha Dist.) (Adhikari, 1988a) and on wood of *Betula utilis*, Nilgatti Odar (Bajhang Dist.) (Adhikari, 1988a). In tropical to temperate belts (Adhikari, 1996).

Distribution: Worldwide.

Gomphaceae

29. *Gomphus clavatus* (Pers: Fr.) S.F. Gray

(= *Craterellus clavatus* Pers.)

Growing on soil, shady and moist place, under *Abies* forest, Phurte, 3546m, 17.8.2004; Giri, Rana & Shrestha, no. 206, NAST.

On soil, Kakani (Pandey, 1976)

Distribution: Europe, North America, Japan, Nepal.

30. *Gomphus floccosus* (Schw.) Singer var. *floccosus*

Growing on moist soil, under *Abies* forest, Lausasa 3570m, 23.8.2004; Giri, Rana & Shrestha, no. 320, NAST.

On earth bank in *Quercus* forest (Balfour-Browne, 1968); in humus in *Abies-Betula* forest, Ratomata, Chakure Lekh (Balfour-Browne, 1955) and on ground, in the mixed forest, Syabru (Adhikari, 1996a).

Distribution: Europe, China, North America, Japan, India, Nepal.

Gomphidiceae

31. *Chroogomphus tomentosus* (Murr.) O.K. Miller

Growing on moist soil, in *Rhododendron* forest, Khunde, 3900m, 20.8.2004; Giri, Rana & Shrestha, no. 241, NAST.

Distribution: Japan, Nepal.

Hydnaceae

32. *Hydnum repandum* L.: Fr.

Growing on moist soil under *Rhododendron* forest, Jami khiau, 3860m, 22.8.2004; Giri, Rana & Shrestha, no. 280, NAST.

In *Pinus roxburghii* forest, on soil, Daman, Kakani, (Pandey, 1976); Kathmandu Manichur (Adhikari, 1976); Suryavinayak (Singh & Nisha, 1976a); market (Adhikari, 1987) and Tokha (Adhikari 1996a; Adhikari & Adhikari, 1997; Adhikari *et al.*, 1996).

Distribution: Europe, North America, Japan, Nepal.

Hygrophoraceae

33. *Hygrocybe strangulata* Orton

Growing on moist soil under *Rhododendron* forest, Khunde, 3900m, 20.8.2004; Giri, Rana & Shrestha, No. 227, NAST.

Distribution: Europe, America, Nepal.

34. *Hygrocybe coccinea* (Schaeff.: Fr.) Kummer

Growing on moist soil under *Rhododendron* forest, Khunde, 3900m, 20.8.2004; Rana, Giri & Shrestha, no. 229, NAST.

On soil, Phulchowki (Singh & Nisha, 1976a) and on moist shady place in *Quercus* forest, Doka Dada, Lumle (Devkota 2005).

Distribution: Europe, Japan, China, N. America, India, Nepal.

Hymenochaetaceae

35. *Coltricia perennis* (Fr.) Murr.

[= *Polystictus perennis* (L.) Fr.]

Growing on dry and sandy soil in open area, Tok Tok, 2725m, 15.8.2004; Giri, Rana & Shrestha, no. 81, NAST.

Previously recorded from Thodung, Lamjura, Rigmo, and

Dudh Koshi (Ryv., 1977); on moist ground, Phulchowki (Lalitpur Dist.) (Singh & Nisha, 1976a) and on thick humus soil with mosses, Seti khola Agra goan forest (Bajhang Dist.) (Adhikari, 1988a).

Distribution: Europe, North America, India, Japan, Russia, Nepal.

Lycoperdaceae

36. *Lycoperdon perlatum* Pers.: Pers.

(= *Lycoperdon gemmatum* Batsch.)

Growing on soil, under *Abies spectabilis* tree, Deboche, 3665m, 25.8.2004; Rana, Giri & Shrestha, no.505, NAST.

Growing on soil in moist shady places among mosses, Kyangjing, Langtang, Rasuwa district (Central Nepal) (Adhikari, 1988d); between Khandhe and Seti Khola bagar, Bajang district (West Nepal) (Adhikari, 1996); and Lohar (Bhandari, 1991).

Distribution: China, Europe, India, Japan, North America, Tasmania, Africa, Australia, Nepal.

37. *Lycoperdon pyriforme* Schaeff.: Pers.

(= *Lycoperdon emodense* Berk.)

Growing on moist soil, under *Rhododendron* forest, Phungi tenga, 3590m, 24.8.2004; Giri, Rana & Shrestha, no.407, NAST.

Growing on rotten dead wood in moist shady places, Suliigadh (West Nepal) (Balfour- Browne, 1968); Thodung, Lamjura and Junbesi (Kreisel, 1969); Phulchowki and Sundarijal (Singh &Nisha, 1976a); Kakani (Pandey, 1976); Kali gad, surmasarowa Lekh, Khuli, Simen, Langtang valley (Kreisel, 1976); between Syabru besi and Lama hotel, Langtang National Park (Adhikari, 1996); Kakani and Pokhara (Adhikari *et al.*, 1996) and on moist ground, under shade of *Alnus nepalensis*, Gauri Khorla, Lumle (Devkota 2005).

Distribution: Europe, Sino- Japan, Central and South East Asia, North America, Australia, Africa, Tasmania, New Zealand, Japan, Australia, Nepal.

Marasmiaceae

38. *Rhodocollybia butyraceae* (Bull.: Fr) Lennox

[= *Collybia butyracea* (Bull.:Fr.) Kummer]

Growing on moist soil, under Coniferous forest, way to Namche, 3150 m, 16.8.2004; Giri, Rana & Shrestha, no. 141, NAST.

On soil, Godavary (Pandey, 1976).

Distribution: Europe, Japan, North America, Nepal.

39. *Mycena capillaries* (Schum.:Fr.)Kummer

Growing on leaf of *Quercus* sp., under mixed forest of *Quercus - Rhododendron*, Muse forest, Lukla, 2783m, 13.8.2004; Rana, Giri & Shrestha, no. 4, NAST.

Distribution: Australia, Europe, Nepal.

Nidulariaceae

40. *Cyathus striatus* (Hud.: Pers.) Will.

Growing on moist twigs of *Abies* sp., Phurte, 3585m, 17.8.2004; Rana, Giri & Shrestha, no. 211B, NAST.

On ground and rotten wood in forest, Sundarijal (Singh & Nisha, 1976a).

Distribution: North America, China, Europe India, Japan, Russia, Nepal.

Paxillaceae

41. *Paxillus involutus* (Batsch : Fr.) Fr.

Growing on moist soil under *Rhododendron* forest, Jami khiau, 3825m, 22.8.2004;

Rana, Giri & Shrestha, no. 271, NAST.

Distribution: North America, Europe, Nepal.

Pezizaceae

42. *Peziza badia* Pers.: Fr.

Growing on dry soil, under mixed forest of *Rhododendron* - *Abies*, Tengboche, 3445m, 26.8.2004; Rana, Giri, & Shrestha, no.590, NAST.

On soil, Ban Thanti (Otani, 1982).

Distribution: Europe, Japan, Nepal, America.

Pleurotaceae

43. *Pleurotus dryinus* (Pers.: Fr.) Kummer

[= *Pleurotus corticatus* Fr.: Fr.] Quel]

Growing on tree trunk of *Abies spectabilis*, Lausasa, 3570m, 23.8.2004; Giri, Rana & Shrestha, no. 306, NAST.

On tree trunk of *Quercus semicarpifolia*, Phulchowki (Singh & Nisha, 1976b).

Distribution: Japan, India, Europe, North America, Nepal.

Polyporaceae

44. *Heterobasidion annosum* (Fr.) Bref.

Growing on cut stump of *Pinus* sp. tree, Jorsalle, 2690m, 15.8.2004; Rana, Giri & Shrestha, no 91, NAST.

On wood of *Rhododendron arboreum*, Manichur (Adhikari, 1988a) and in tropical to temperate belts (Adhikari, 1996a).

Distribution: Europe, Japan, China, North America, India, Nepal.

Pyronemataceae

45. *Aleuria aurantia* (Fr.) Fuck.

(= *Peziza aurantia* Fr.)

Growing on moist places on twigs of *Rhododendron* sp., Deboche, 3665m, 25.8.2004; Giri, Rana & Shrestha, no. 554, NAST.

On soil, Ghar Khola (Balfour-Browne, 1968; Singh & Nisha, 1976a); Kyumnu (Otani, 1982) and from Maipokhari area, Ilam (Adhikari, 1998).

Distribution: Europe, Japan, China, India, America, Nepal.

46. *Otidea onotica* (Pers.: Fr.) Fuck.

Growing on moist soil, Phungi tenga, 3340m, 21.8 2004; Giri, Rana & Shrestha, no. 403, NAST.

On soil, Dhunche, Sing Gompa (Otani, 1982).

Distribution: North America, Europe, Japan, Nepal.

47. *Scutellinia scutellata* (L.: Fr.) Lamb

Growing on *Tsuga* tree, Deboche, 3665m, 26.8.2004; Rana, Giri & Shrestha, no. 572, NAST.

On soil, dead *Yucca* and twigs, Balaju, Kathmandu (Waraitch

& Thind, 1977).

Distribution: North America, Europe, Japan, China, Australia, Nepal.

Ramariaceae

48. *Ramaria flava* (Schaeff.: Fr.) Quel.

On Moist Soil, under *Abies spectabilis* tree, Phurte, 3615m, 17.8.2004; Giri, Rana & Shrestha, no. 207, NAST.

Sold at Kathmandu market (Adhikari, 1996; Adhikari & Adhikari, 1997; Adhikari *et al.*, 1996).

Distribution: Europe, North America, Australia, Japan, India, China, Nepal.

Russulaceae

49. *Lactarius deliciosus* (L.: Fr.) S.F. Gray

Growing on moist soil, under *Abies* forest, Lausasa, 3570m, 23.8.2004; Giri, Rana & Shrestha, no. 303, NAST.

This species is recorded from Manichur (Adhikari, 1976); Daman (Pandey, 1976); Manang (Bhandary, 1991); on ground in *Abies spectabilis*, *Larix himalaica* and *Rhododendron* sp. forest between Syabrua and Chandanbari (Bill and Cotter, 1989) and in mixed forest, Sundarijal (Adhikari *et al.*, 1996).

Distribution: Europe, North America, Japan, Nepal.

50. *Lactarius piperatus* (Fr.) S.F. Gray

Growing on moist soil under Coniferous forest, Muse Forest, Lukla, 2783m, 13.8.2004; Giri, Rana & Shrestha, no. 10GH, NAST.

Kathmandu valley (Singh, 1966); Daman (Pandey, 1976); growing on soil in *Pinus roxburghii* forest, Tokha, Nagarkot (Adhikari, 1996; Adhikari *et al.*, 1996); Suryavinayak, Lele and Phulchoki (Adhikari, 1996); Hetauda (Poudel, 1997) and on soil in *Rhododendron* forest, Gauri Khorla, Lumle (Devkota, 2005).

Distribution: China, Europe, Russia, North America, Japan, Nepal.

51. *Lactarius subdulcis* (Pers.:Fr.) S. F. Gray

Growing on Moist soil, Muse Forest, Lukla, 2783m, 13.8.2004; Giri, Rana & Shrestha, no. 10L, NAST.

From Kathmandu valley (Adhikari, 1976; Singh, 1966)

Distribution: Europe, North America, Japan, Nepal.

52. *Lactarius volemus* (Fr.) Fr.

Growing on moist soil, under *Rhododendron* - *Betula* mixed forest, Deboche, 3665m, 25.8.2004; Giri, Rana & Shrestha, no. 502, NAST.

From Manichur (Adhikari, 1976); Nagarjoun, Kathmandu Valley (Pandey 1976); on soil in *Pinus roxburghii* forest, Nagarkot, Lele, Bajrayogini, Dakshinkali, in mixed forest, Matatirtha; Suryavinak and Phulchowki (Adhikari, 1996; Adhikari *et al.*, 1996); Mai pokhari (Adhikari, 2000) and on soil in shade of *Rhododendron arboreum*, Mulbari, Lumle (Devkota, 2005).

Distribution: Worldwide.

53. *Russula densifolia* (Secr.) Gill.

Growing on moist soil under *Pinus* forest, Tengboche, 3702m,

24.8.2004; Giri, Rana & Shrestha, no. 427, NAST.

Growing on soil in moist shady place in *Pinus roxburghii* forest, Royal Botanical Garden, Godavary (Adhikari, 1984); Lele, Brjayogini, Lele and in mixed forest, Suryavinayak Adhikari, 2000).

Distribution: Worldwide.

54. *Russula olivacea* (Schaeff.) Fr.

On moist soil, under mixed forest of *Rhododendron - Tsuga*, Muse forest, Lukla, 2783m, 13.8.2004; Giri, Rana & Shrestha, no. 24, NAST.

Growing on soil in moist shady place in mixed forest of *Pinus wallichiana - Abies* sp., Junbesi-Rachuwa (Adhikari, 1990b).

Distribution: Europe, North America, Nepal.

55. *Russula metachroa* Hongo

Growing on moist soil in open place, in *Abies* forest, Phurte, 3585m, 17.8.2004; Giri, Rana & Shrestha, no. 203, NAST.

Distribution: Japan, North America, Europe, Nepal.

56. *Russula paludosa* Britz.

Growing on moist soil under *Rhododendron* and *Abies* tree, Tengboche, 3645m 24.8.2004; Giri, Rana & Shrestha, no.413, NAST.

Distribution: North America, Europe, Nepal.

Sclerodermataceae

57. *Scleroderma citrinum* Pers.:Pers.

[=*Scleroderma vulgare* (Horneum) Fr.; *Scleroderma aurantium* Pers.]

Growing on soil in shady places, in *Rhododendron* forest, Khunde, 3900m, 20.8.2004; Rana, Giri & Shrestha, no. 243, NAST.

Growing on soil in moist shady places, in *Pinus roxburghii* forest, Methand Pokhara (Balfour - Browne, 1968); Nagarjooon (Pandey, 1976); Godavary (Singh & Nisha, 1976a); Manichur, Sybrubesi (Langtang area), (Adhikari, 1987); Sundarijal, Kathmandu valley; sold in Kathmandu market, in mixed forest, Matatirtha and Pokhara, Raniban (Adhikari *et al.*, 1996).

Distribution: Europe, North and South America, Australia, Japan, India.

Strobilomycetaceae

58. *Strobilomyces strobilaceus* (Scop.:Fr.) Berk.

[=*Strobilomyces floccopus* (Vahl. : Fr.) Karst.]

Growing on moist soil under Coniferous forest, Lukla/Ghat, 2604m, 14.8.2004; Rana, Giri & Shrestha, no. 41, NAST.

On ground, Phulchowki (Singh & Nisha, 1976a) and Suryavinayak. (Adhikari, 1996).

Distribution: Worldwide.

Strophariaceae

59. *Hypholoma capnoides* (Fries) Kumm.

(= *Naematoloma capnoides* (Fr.: Fr.) Kumm.

Growing on moist soil in bunch, under *Pinus* and *Rhododendron* forest, Phurte 2840m, 17.8.2004, Rana, Giri & Shrestha, no. 121, NAST.

Distribution: North America, Europe, Japan, China, Nepal.

60. *Stropharia semiglobata* (Batsch.: Fr.) Quel

Growing on Yak dung, Lausasa, 3770m, 23.8.2004; Rana, Giri & Shrestha, no.302A, NAST.

Distribution: America, Europe, China, Japan, Nepal.

61. *Pholiota aurivella* (Batsch.: Fr.) Kummer

Growing on *Abies* tree trunk in a bunch, shady moist place, Tengboche, 3702m, 24.8.2004; Giri, Rana & Shrestha, no.408, NAST.

Manichur (Adhikari, 1976); Market and Landrung (Bhandary, 1984).

Distribution: Worldwide.

62. *Pholiota nameko* (Ito) Ito & Imai

[= *Collybia nameko* T. Ito; *Pholiota gultinosa* Kawam.; *Kuehneromyces nameko* (T. Ito) S. Ito]

Growing on moist soil, under *Abies* tree, Khumjung, 3800m, 21.8.2004; Rana, Giri, & Shrestha, no. 251, NAST.

Place not mentioned (Bhandary, 1984).

Distribution: Japan, Nepal.

Tremellaceae

63. *Pseudohydnum gelatinosum* (Scop.: Fr.) Karst.

Growing on dead log of *Rhododendron* tree, Omaka forest (Pangboche), 3890m, 25.8.2004; Giri, Rana & Shrestha, no. 550, NAST.

Distribution: America, Japan, Europe, Nepal.

Tricholomataceae

64. *Armillaria mellea* (Vahl.: Fr.) Kummer.

Growing under coniferous forest, Lukla, Muse forest, 2783m, 13.8.2004; Giri, Rana and Shrestha, no. 1, NAST.

Host not mentioned, Lele (Pandey, 1976); Arun valley (Balfour - Browne, 1968); Phulchoki (Singh & Nisha, 1976a); Kutungsang and Kalopani (Cotter, 1987) and growing on decayed log in moist shady place in afforested area of pine (exotic), Kakani (Adhikari *et al.*, 1996).

Distribution: Worldwide.

65. *Laccaria amethystina* (Huds.) Cooke

Growing on moist soil under coniferous forest, Lukla, Muse forest, 2783m, 13.8.2004; Rana, Giri and Shrestha, no.10c, NAST.

On soil, Hetauda (Pandey, 1976); Suryavinayk (Bhandari, 1980); in *Pinus* forest, Kakani, Brajayogini, in mixed forest Suryabinayak, Matatirtha and Sundarijal (Adhikari & Adhikari, 1997).

Distribution: Europe, North America, Japan, Nepal.

66. *Laccaria bicolor* (Maire) P.D. Orton

Growing on moist soil associated with mosses, under Pine forest, Phakdin, 2500m, 14.8.2004; Rana, Giri & Shrestha, no. 61, NAST.

Distribution: Japan, Nepal.

67. *Laccaria laccata* (Scop.: Fr) Cooke

Growing on moist soil under *Rhododendron* and *Juniperus* forest, Syanboche, 3940m, 20.8.2004; Giri, Rana & Shrestha, no. 233, NAST.

On soil, Arun Valley (Balfour - Browne, 1968); Bajrabarahi, Nagarjooon (Pandey,1976); Godavari (Singh & Nisha, 1966c); growing in moist shady place in *Pinus* forest, Kakani, Tokha, Bajrayogini, Lele, Nagarkot, in mixed forest, Sudarijal, Suryavinayak, Matatirtha and Pokhara (Adhikari *et al.*,1996) and on soil, Syaniswara, Lumle (Devkota, 2005).

Distribution: Worldwide.

68. *Laccaria proxima* (Boudier) Pat

Growing on moist soil, under Pine forest, Jorsalle, 2690m, 15.8.2004; Giri, Rana & Shrestha, no. 102, NAST.

Distribution: Japan, North America, Bulgaria, Nepal.

69. *Tricholoma saponaceum* (Fr.:Fr.) Kummer

Growing on shady places, on soil, under *Abies* forest, Phurte, 3615m, 17.8.2004;

Rana, Giri & Shrestha, no. 208, NAST.

On soil, Godavary (Pandey, 1976).

Distribution: Europe, Japan, North America, Nepal.

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