



REGULAR ARTICLE

ISOLATION OF SOIL MYCOFLORA OF KATAO NEAR GANGTOK, INDIA

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SUMMARY

Isolation of soil mycoflora from Katao was observed by serial dilution method, In investigation period 146 colonies of 21 fungal species were observed the maximum percentage contribution of *Aspergillus fumigatus*, *A. niger* (12.32%), was followed by *A. flavus*, *A. luchensis*, *Mucor sp.* (6.84%) and minimum percentage contribution of *Cladosporium sp.* (0.68%). The maximum fungal species belongs to the Anamorphic fungi (121 colonies), Zygomycotina (18 Colonies) and mycelia sterilia (white) (7 colonies) were observed.

Key words: Gangtok, *Aspergillus fumigatus*, soil mycoflora

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1. Introduction

The quality and quantity of organic materials present in the soil have a direct effect on the fungal population of the soil. The development of microfungi is especially favoured by soils having an acidic reaction and where the aerobic condition is likely to be present near the surface.

Fungi play a focal role in nutrient cycling by regulating soil biological activity. However the role at which organic matter is decomposed by the microbes is interrelated to the chemical composition of the substrate as well as environmental conditions (Arunachalam et al., 1997). Fungi come in many different species, sizes, and shapes in soil. The numbers and kinds of micro-organisms present in soil depend on many environmental factors: amount and type of nutrients available, available moisture, degree of aeration, pH, temperature etc.

Katao is 173 kms From Gangtok. Katao Valley is situated at an altitude of 15,000 ft above sea level. With the panoramic view of snow capped peaks of the Himalayas, it is a rival to Yumthang in beauty. The valley is covered with poppy, primula and rhododendron. A military check-post is nearby. Katao remains under ice cover in March-April. The aim of the present investigation is to isolate mycoflora from

Katao soil, and to observe the percentage contribution of different fungal species.

2. Materials and Methods

Soil sample were collected from Katao region in a small sterilized plastic bottle. Potato Dextrose Agar (Potato 20%, Dextrose 2% and Agar 1.5%) was used to isolate fungi from soil.

Isolation of fungi - The fungal species were isolated by serial dilution method, 1g of soil sample was suspended in 10ml double distilled water to make microbial suspension, this suspension was used to make microbial concentration (10^{-1} - 10^{-5}). 1ml of microbial suspension of each concentration were added to sterile Petri dishes (triplicate of each dilution) containing 15ml of sterile Potato dextrose agar media. The Petri dishes were then incubated for 4-6 days for $26 \pm 1^\circ\text{C}$. After incubation the fungi were identified and frequency distribution of fungal species was investigated

3. Result and Discussions

During the investigation period 146 fungal colonies of 21 fungal species were observed. The maximum fungal species belongs to Anamorphic fungi (121 colonies) colonies, Zygomycotina (18 Colonies) and mycelia sterilia (white) (7 colonies) were observed (Table 1).

The results of present investigation reveal with various work done by researchers. Some *Aspergillus* species such as *Aspergillus niger* and *A. temari* were isolated from soil of forest and cave ecosystems of Taiwan by Hsu and Agoramoorthy (2001). Sharma (2009) studied soil mycoflora of Yumthang valley & observed that maximum contribution was of class Ascomycotina. Microbial analysis of different soil samples of selected site in Obafemi Awolowo University, Nigeria was investigated by Ogunmwonyi *et al.* (2008) they found *Aspergillus niger* as a dominated fungi among all, in the present investigation *A. fumigatus* found dominated in different fungal species. Baxter and Illston (1980) found some fungal species such as *Alternaria alternate*, *Chrysosporium pannorum*, *Cladosporium cladosporioides*, *Fusarium sp.*,

Mucor hiemalis, *M. racemosus* etc. from low temperature region of New Zealand, in the present work we have also found similar fungal genera such as *Alternaria*, *Cladosporium*, *Mucor* etc. from the low temperature region of Gabgtok. Fungi belonging to genera *Acremonium*, *Aspergillus*, *Cladosporium*, *Fusarium* and *Trichoderma* were isolates from Antarctic soils by Singh *et al.* (2006). Species of *Penicillium* and *Trichoderma* were found from different tea growing locations in India by Pandey *et al.* (2001) The fungi were isolated from mesophilic temperature ranges of 15 °C to 35 °C. About 90 fungal stains were isolates form the soil of Kotri barrage, Pakistan by Suhail *et al.* (2007). Among the 21 *Aspergillus* species isolated, the *A. niger* was found as dominant.

Table 1. Observations of different fungal species from Gangtok soil

S. no.	Fungal sp.	% contribution
1	<i>Aspergillus awamori</i>	5.47
2	<i>Aspergillus chartarum</i>	1.36
3	<i>Aspergillus flavus</i>	6.84
4	<i>Aspergillus fumigatus</i>	12.32
5	<i>Aspergillus japonicus</i>	2.73
6	<i>Aspergillus luchensis</i>	6.84
7	<i>Aspergillus nidulans</i>	1.36
8	<i>Aspergillus niger</i>	12.32
9	<i>Aspergillus sp.</i>	5.47
10	<i>Bispora sp.</i>	2.73
11	<i>Cladosporium sp.</i>	0.68
12	<i>Curvularia sp.</i>	5.47
13	<i>Fusarium sp.</i>	1.36
14	<i>Mucor sp.</i>	6.84
15	<i>Mycellium sterilla</i>	4.79
16	<i>Nigrospora sp.</i>	5.47
17	<i>Penicillium chrysosporium</i>	1.36
18	<i>Penicillium frequentans</i>	5.47
19	<i>Penicillium sp</i>	4.09
20	<i>Pycnidial sp.</i>	1.36
21	<i>Rhizopus sp</i>	5.47

4. Conclusion

The fungi are omnipresence in environment, they gets dominated by secreting enzymes in cold region. It has been shown recently that fungi are not only able to

survive but also to propagate in various environmental extremes (Gunde Cimerman *et al.* 2003). The fungi obtained from the site of present investigation belong to low temperature region. Now it was concluded

that the isolated fungal species were get adopted at the low temperature.

References

- Arunachalam, K., Arunachalam, A., Tripathi, R. S. and Pandey H. N. 1997. Dynamics of microbial population during the aggradation phase of a selectively logged subtropical humid forest in north east India. *Trop. Ecol.* 38, 333-341.
- Baxter, M. & Illston, G. M. 1980. Temperature Relationships of Fungi Isolated at Low Temperatures from Soils and other Substrates. *Mycopathologia* 72, p. 21-25.
- Gunde-cimerman N., Sonjak S., Zalar P., Frisvad J.C., Diderichsen B. and Plemenitaš A. (2003). Extermophilic fungi in Arctic ice: a relationship between adaptation to low temperature and water activity. *Physics and Chemistry of the Earth* 28:1273-1278
- Hsu, M. J. and Agoramoorthy, G. 2001. Occurrence and diversity of thermophilous soil microfungi in forest and cave ecosystems of Taiwan. *Fungal Diversity*, 7 p.27-33.
- Ogunmwonyi I. N, Igbinosa, O. E, Aiyegoro, O. A. and Odjadjare, E. E. 2008. Microbial analysis of different top soil samples of selected site in Obafemi Awolowo University, Nigeria. *Scientific Research and Essay*, 3(3), p.120-124.
- Pandey, A., Palni, L. M. S. and Bisht, D. 2001. Dominant fungi in the rhizosphere of stablished tea bushes and their interaction with the dominant bacteria under *in situ* conditions. *Microbiological Research*. 156(4), p. 377-382.
- Russell, N. J. 2000. Toward a molecular understanding of cold activity of enzymes from psychrophiles. *Extremophiles*, 4, p. 83-90.
- Singh, S. M., Puja, G. and Bhat, D. J. 2006. Psychrophilic fungi from Schirmacher Oasis, East Antarctica. *Current Science*, 90(10), p.1388-1392.
- Sharma, K & Mahish, P, 2009. Isolation of soil mycoflora from yumthang valley, Sikkim. *Lab to land* 2(1), p. 42-45.
- Suhail, M., Irum, F., Jatt, T., Korejo, F. and Abro, H. 2007. *Aspergillus* Mycoflora isolated from soil of Kotri Barrage Sindh, Pakistan. *Pak. J. Bot.* 39(3) p. 981-984.