Reprinted from the Defence Science Issue of January 1974

STUDY OF SOIL MICROFLORA FROM ASSAM AND NEFA

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(*Received* 2 *January* 1971 ; *revised* 29 *September* 1972)

This short note describes the fungi isolated from various soil samples of Assam and NEFA with special reference to the cellulolytic types of fungal isolates.

Wide spread fungal deterioration of tentage resulting in heavy losses have been reported from different places in the Eastern sector of India[1]. Assam and NEFA soils were least investigated with respect to biological activity on degradation of Service materials, stores, equipments, etc. In view of extensive occurance of fungal degradation particularly to cotton-textiles, rubber and other allied Defence stores under different conditions of storage, transit and use in the region, a sample study was undertaken to investigate the types of microorganisms specially fungi found in the soils of Assam and NEFA. Bacterial degradation being confined to ground contact or near wet conditions of storage, the emphasis was laid on the widespread fungal deterioration only.

MATERIALS AND METHODS

The soil samples were preliminarily collected from Bhumuraguri, Rangiya, Dimapur, Dharang, Diphu Lumding, Tamulpur, Gauhati, Jorhat, and Tezpur in Assam and Bhallukpung in NEFA. These were taken from 15 cm. depth[1] and placed in sterile polythene bags, duly sealed and brought to laboratory or isolation of fungal flora. The samples were stored in refrigerator at 10°C until used.

The isolation was done by dilution plate method[3] using Potato-Dextrose Agar, Czapek Dox Agar Waksman and Malt Agar media[4]. Two replicates were taken for dilutions in each medium. After seven days of incubation at 30±2°C, the petridishes were examined and different types of fungi were isolated, purified to individual types and tentatively identified.

A total number of 173 fungal isolates from different places are given in Table 1.

TABLE 1

FUNGI ISOLATED FROM SOIL SAMPLES COLLECTED FROM ASSAM AND NEFA

Place	Fungal isolates	Place	Fungal isolates
Bhumuraguri	25	Gauhati	21
Rangiya	9	Lumding	8
Dimapur	7	Tamulpur	13
Dharang	9	Jorhat	11
Diphu	14	Tezpur	39
Bhallukpung	27		

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Majority of fungal isolates belonged to *Aspergillus* and *Penicillium* groups. Other prominent species were *Fusarium, Paecilomyces, Trichoderma, Curvularia, Cladosporium, Cunninghamella, Helminthosporium, Alternaria, Verticillium, Syncephalastrum,* and *Actinomyces*. There were few fungal isolates of non-sporulating types belonging to *Dematiaceae* and *Momiliaceae* families.

The cellulose destroying capacity of fungi was determined by using the Fabric Test Method[5] developed at DRL (M), Kanpur. The breaking strength was determined as per the method given in Indian Standard Specifications[6] and percentage loss was calculated.

RESULTS AND CONCLUSION

An examination of cellulose destroying capacity of various fungi showed that out of 173 fungal isolates, 90 fungi were found to be highly cellulolytic giving a loss between 40 to 100% and 44 fungi had low cellulolytic activity below 40%, while 39 fungi were not at all celluloyltic.

It is, therefore, concluded that cellulolytic fungi are very common in the soils of Assam and NEFA and there are many showing very high cellulolytic activity. Consequently the microbial deterioration of Service stores, particularly cotton textiles, in these regions of Assam and NEFA has been extensively encountered.

The study revealed that there is a great need for detailed studies of soil fungal flora to determine their cellulolytic activity so that protective and preventive measures could be developed against microbial degradation of Service stores in that region.

ACKNOWLEDGEMENTS

The authors are thankful to the Director Dr. J.N. Nanda, and Deputy Director Dr. P.N. Agarwal for their interest and encouragement and Shri H.M. Dayal for helpful suggestions.

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