

B.Sc I. P-II Unit I

Vandana

15.04.29

Lichen :- Economic imp.

- ① Pioneers in colonization : \therefore - lichen acid can break down rocky substratum : minimum water & nutritional requirement
- ② Absorption of radioactivity by :-
Cladonia rangiferina.
- ③ Bioindicator of SO₂ pollution
- ④ Food & fodder
↓
Cetraria islandica "*Cladonia rangiferina*"
- ⑤ A co. CHO - Lichenin \rightarrow alcoholic fermentates
- ⑥ Tannin & Dye \rightarrow *Lobaria pulmonaria*
↓
Cetraria islandica
- ⑦ Astringent \rightarrow Leather industry
- ⑧ Litmus - *Rocella montagana*
- ⑨ Ocrein dye -
- ⑩ Usnic acid \rightarrow *Usnea* & *Cladonia*
↓
antibiotic
- ⑪ *Lobaria pulmonaria* \rightarrow extract \rightarrow Respiratory disorder
- ⑫ *Parmelia saxatilis* \rightarrow extract \rightarrow Epilepsy
- ⑬ Evernia & Ramalina - Perfumed oil
- ⑭ *Ramalina calicaria* \rightarrow Sealant-hairs in wig industry
↓
Dorp & Hawaiian medicinal

(2)

③ Brewery - Aspergillus & Rhizopus.

④ Bakery - S. cerevisiae, yeast

⑤ cheese - P. camemberti, P. roqueforti

⑥ Pigments → Spizulosin → blue pigment → P. spizulosus

III Scavengers - Chaetomium globosum
↓
Vegetable vulture.

IV Soil fertility → N₂ fix - Rhodospirillum rubrum. Saccharomyces

V Insecticide - predator on Nematodes → Dactylospora, Dactylaria, Stylopsis, Actinospora

VI Mycorrhizal Boletus, Phoma, Amanita, Rhizoglyphus

VII Antiviral properties Aspergillus, Fusarium, Rhizoglyphus, Colletotrichum.

VIII Fungus Neurospora, A. nidulans.

IX Bioluminescent Fomes, Polyporus.

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25.04.2020

Economic Imp of fungi - ①

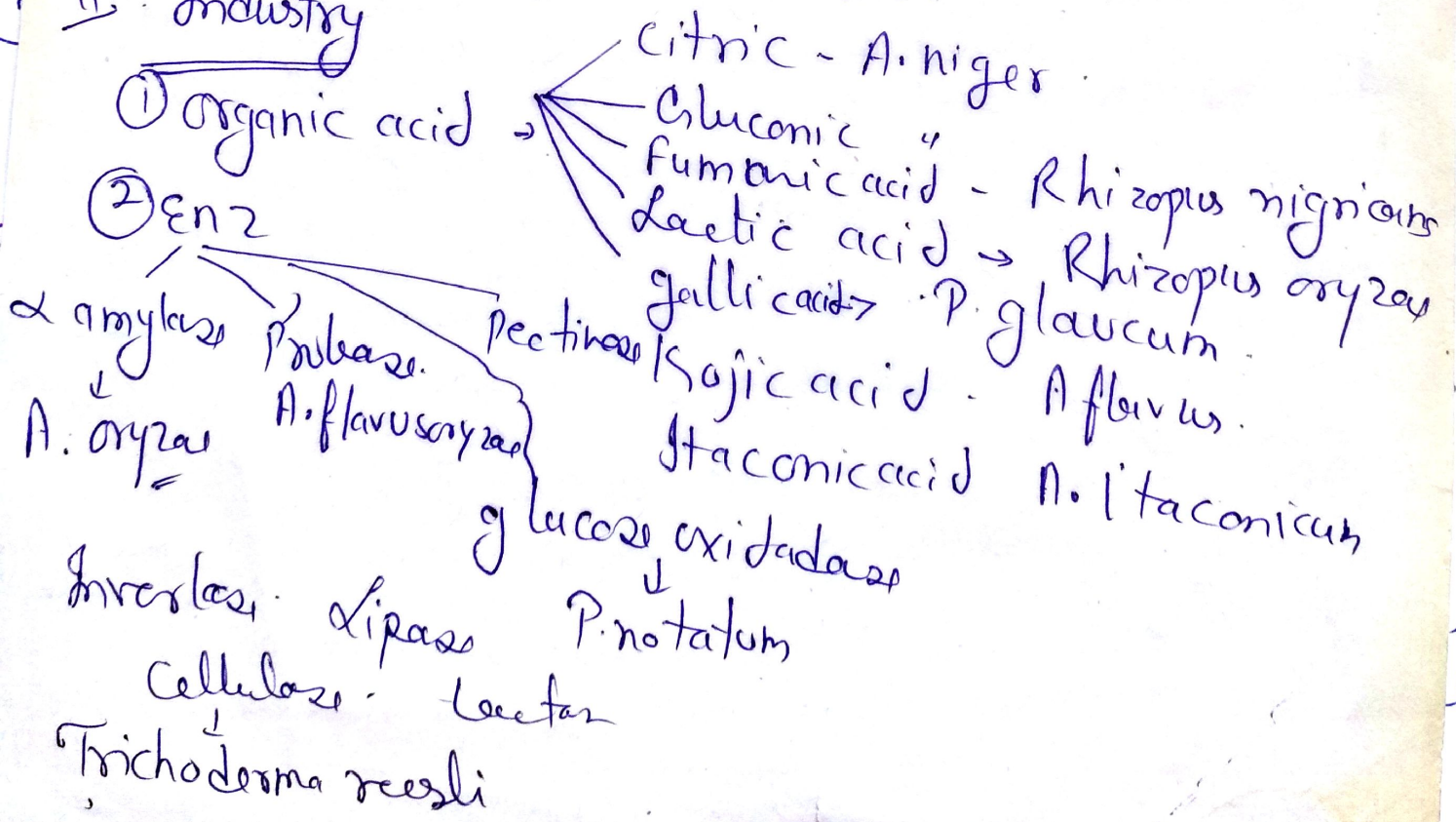
→ Decomposers of dead organic matter

In Medicine

- ① ~~etc~~ Calvatia gigantea → Calvacin → anticancer prop
- ② Vitamin source → Vit-B complex - Yeast
 e, D
 Riboflavin → ~~Asb~~ Ashbya gossypii
 Vit A → Rhodotorula gracilis
- ③ steroid → Rhizopus nigricans & A. niger
- ④ Ergot → Claviceps purpurea
- ⑤ Ephedrin → Yeast action on benzaldehyde
- ⑥ Biodyne → yeast
- ⑦ Antibiotics -
- ⑧ Mycophenolic acid & hadacidin → anti-tumour

Chemicals from Penicillium

II. Industry



PI unit I Role of fungi as food Vandana B. S.C.T 20.04.20

A wide range of fungi foods are obtained from fungi which are more popular in the west

Fungi make foods palatable, increase their protein contents and also produce single cell proteins (SCP)

① Soyabean and Cassava are rich in protein nutrients but are easily digestible. They are made palatable by fermenting them with fungi. Temph is fermented soyabean made by *Rhizopus oligosporus*. It is tasty, more digestible and free from trypsin inhibitor. Cassava is low protein food. It is upgraded with fungi in presence of mineral nitrogen to form Tapioca (fermented cassava)

② Incaparina (Protein cakes) is prepared by mixing yeast or *R. oligosporus* with some cereal flours to increase protein contents. Such cakes are such in Niacin and riboflavin.

③ SCP (Single cell protein) is a microbial protein obtained from Algae, fungi, yeast and Bacteria. Fungi like *Fusarium*, *Aspergillus*, *Penicillium*, *Rhizopus* and yeast like *Candida*, *Torulopsis*, *Kluyveromyces* are exploited for the production of SCP. Fungi contain 19-47% protein content and are rich in methionine, Vitamin B₁₂ & Riboflavin.

Yeast contains 45-55% most digestible form of protein and are rich in vitamins and most of essential amino acids except methionine. They also have salts and fats. The yeast like *Torulopsis* and *Endomyces* are used in supplementing protein deficient diet and livestock food.

Yeasts - grown on ammonia rich molasses yield food yeast that has 40 to 50% proteins and vitamin B complex. The large scale production of yeast as food is called Microbial farming.

1) Fermented food

Preparation of Jubbies, Idli, Kanji, warris etc. involve fermentation by *Saccharomyces Torulopsis*, *Trichosporous* and *Hansenula anomala*.

3

The fructifications (Mushrooms fruiting bodies) of mushrooms, morels, Truffles and puffballs are used as food since time immemorial and esteemed as delicacies. They are rich in proteins (21% to 53.5%), vitamins, & minerals (Fe & Cu) and free amino acids. *Morchella esculenta* (a highly prized morel) is grown in Punjab, UP & Kashmir.

Agaricus brunneus (*A. bisporus*) is cultivated in Europe, America and North India/Sikkim.

A. campestris in South India & Japan.

Volvariella volvacea in China and SE Asia.

Lentinus edodes in Japan.

Cortinellus in France

Collybia velutipes - a mushroom of western countries has 53.5% protein content.

Boletus edulis, *Coprinus comatus*, *Ramaria apiculata* are other popular edible mushrooms. *Clavaria gigantea* (giant puffball), *Ramaria*.

Lycoperdon (puff balls) and *Tuber aestivum* (truffle is underground fruiting body) act as appetizers and add flavour to food.

Mushrooms are good for diabetic patients because they are rich in proteins (upto 53.5%), minerals and vitamins.