

Lecture 2

Introduction to wild and cultivated mushrooms of Nepal and their economic importance. Reproduction: Mating system in fungi, Homothallism, Secondary homothallism, Heterothallism (bipolar and tetrapolar). Life cycle of mushroom

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Introduction to wild and cultivated mushrooms of Nepal

B. Types of cultivated mushroom

TABLE 2: TYPES OF CULTIVATED MUSHROOM

Types	Name	Geographical Distribution
White button mushroom	Gobre chyau (<i>Agaricus bisporus</i>)	Hilly region
Oyster Mushroom	Kanye chyau (<i>Pleurotus ostreatus</i>)	Hilly regions, Terai region in winter
Shiitake	Mirge chyau (<i>Lentinus edodes</i>)	Midhills
Straw mushroom	Parale chyau (<i>Volvorielle volvacea</i>)	Terai region
Ganoderma	Rato chyua (<i>Ganoderma lucidum</i>)	Hilly Region

Some important wild mushrooms of very high commercial value are:

1. *Boletus edulis* (Cep, or Bolete)
2. *Cantharellus cibarius* (Chantharelle)
3. *Cordyceps sinensis* (Yarsagumba in Nepali)
4. *Craterellus conucopiodes* (Horn of plenty)
5. *Ganoderma lucidum*
6. *Morchella conica* (Morel)
7. *Morchella esculenta* (Morel)
8. *Tricholoma matsutake* (Matsutake)

Introduction to wild and cultivated mushrooms of Nepal

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|----------------------------------|--|----------------------------------|---|
| 1. <i>Agaricus bisporus</i> | 11. <i>Ganoderma lucidum</i> | 21. <i>Pholiota adiposa</i> | 32. <i>Pleurotus pulmomarius</i> |
| 2. <i>Agaricus bitorquis</i> | 12. <i>Grifola frondosa</i> | 22. <i>Pholiota nameko</i> | 33. <i>Lentinus sajor-caju</i> |
| 3. <i>Agaricus blazei</i> | 13. <i>Hericium erinaceum</i> | 23. <i>Pleurotus abalonus</i> | 34. <i>Pleurotus salmoneostramineus</i> |
| 4. <i>Agrocybe cylindracea</i> | 14. <i>Hypsizigus marmoreus</i> | 24. <i>Pleurotus columbinus</i> | 35. <i>Sparassis crispa</i> |
| 5. <i>Auricularia auricula</i> | 15. <i>Lentinula edodes</i> (Shiitake) | 25. <i>Pleurotus cornucopiae</i> | 36. <i>Stropharia rugoso-annulata</i> |
| 6. <i>Auricularia polytricha</i> | 16. <i>Lepista nuda</i> | 26. <i>Pleurotus eryngii</i> | 37. <i>Tremella fuciformis</i> |
| 7. <i>Calocybe indica</i> | 17. <i>Lepista sordida</i> | 27. <i>Pleurotus flabellatus</i> | 38. <i>Volvariella volvacea</i> |
| 8. <i>Coprinus comatus</i> | 18. <i>Lyophyllum decates</i> | 28. <i>Pleurotus floridus</i> | |
| 9. <i>Dictyophora indusiata</i> | 19. <i>Lyophyllum shimeji</i> | 29. <i>Pleurotus nebrodensis</i> | |
| 10. <i>Flammulina velutipes</i> | 20. <i>Naematiloma sublateritium</i> | 30. <i>Pleurotus opuntiae</i> | |
| | | 31. <i>Pleurotus ostreatus</i> | |

Agaricus bisporus



Pleurotus ostreatus



Lentinula edodes



Volvorielle volvacea



Ganoderma lucidum

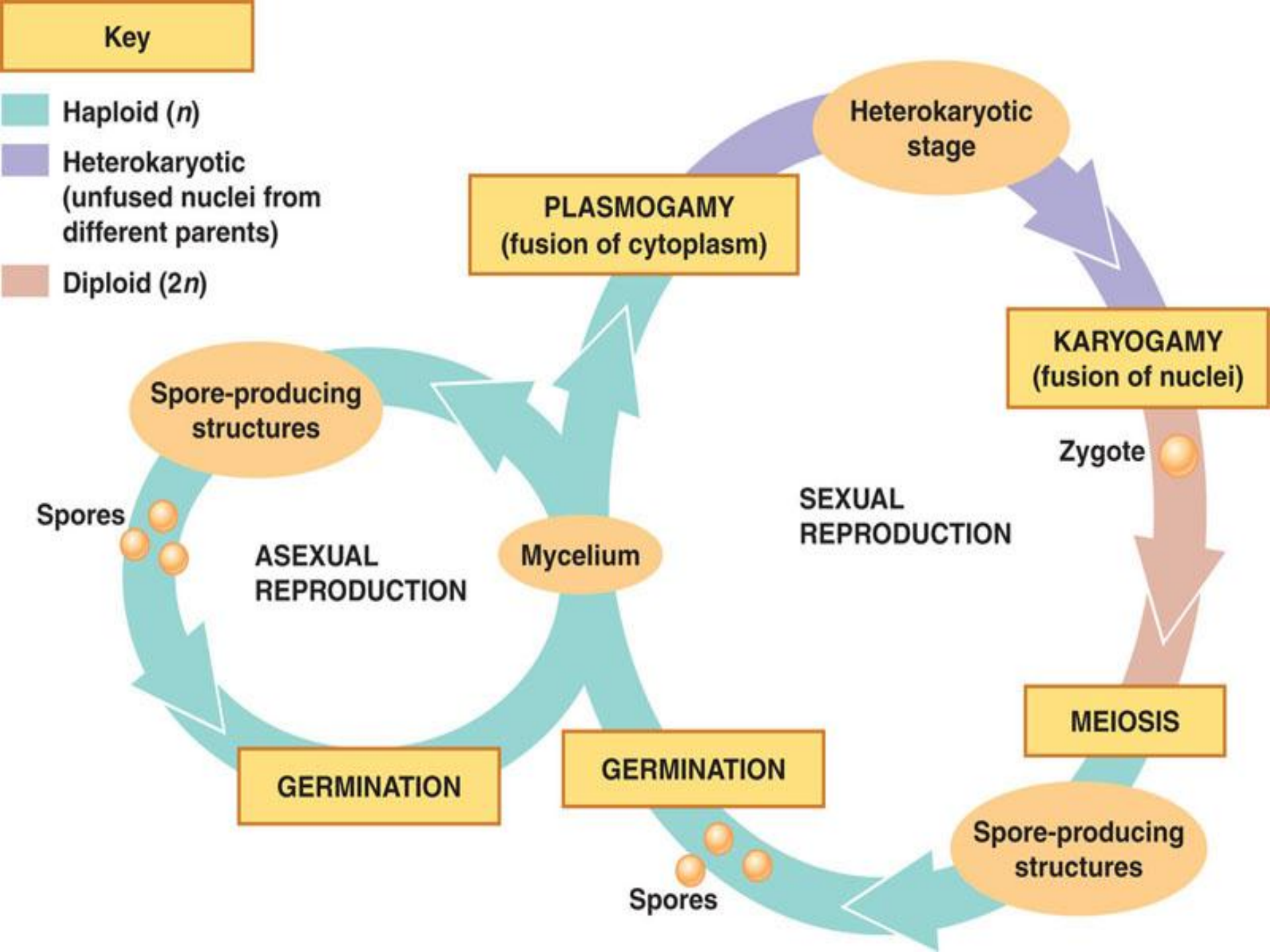


Boletus edulis



Mating system in fungi

- Not all fungi reproduce sexually and many that do are isogamous; the terms "male" and "female" do not apply to many members of the fungal kingdom.
- Homothallic species are able to mate with themselves, while in heterothallic species only isolates of opposite mating types can mate.



Types of hyphae

•Homothallic

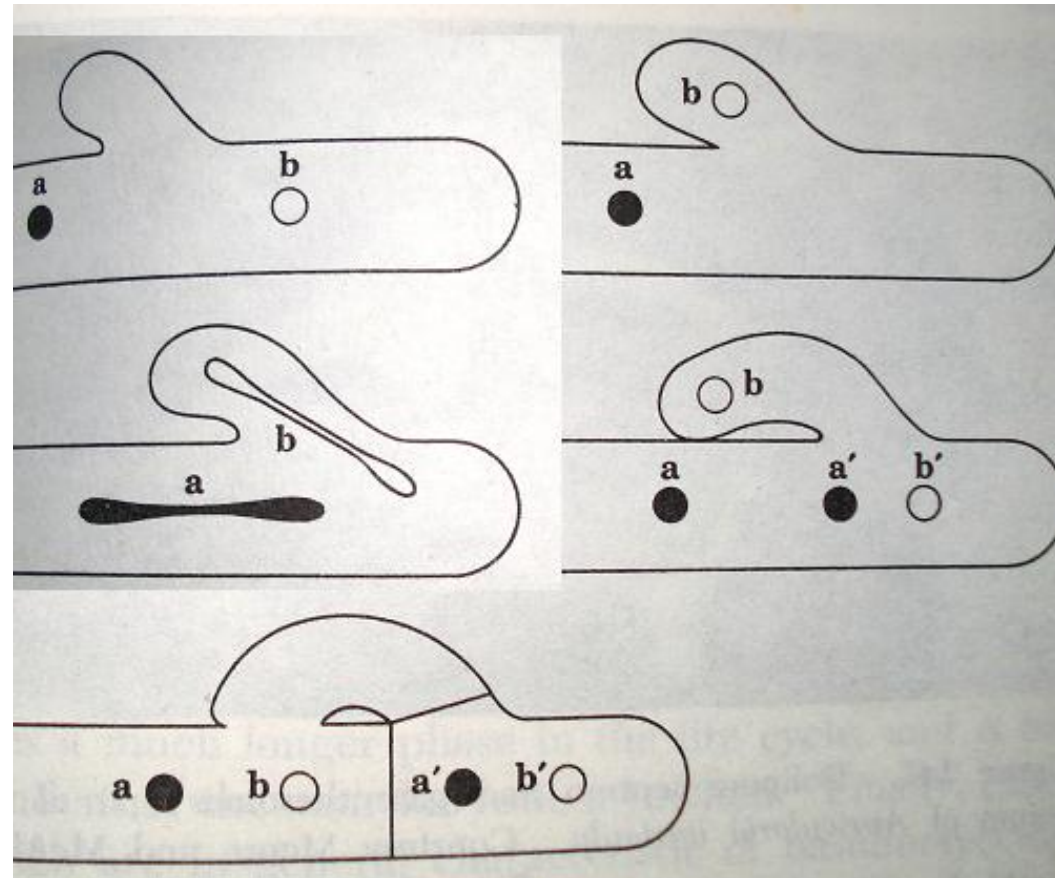
Haploid thallus developed from single spore bearing both sexes and self –fertile (*Monoblepheris*, *Allomyces*, *Pythium*) Or Same individual thallus is sexually self-fertile.

Many fungi, however, are homothallic; i.e., sex organs produced by a single thallus are self-compatible, and a second thallus is unnecessary for sexual reproduction.

Secondary Homothallic

In bipolar heterothallic fungi during spore formation two nuclei of opposite mating types are incorporated regularly in each spore. On germination it gives arise to a thallus containing A and a nuclei.

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Secondary Homothallic

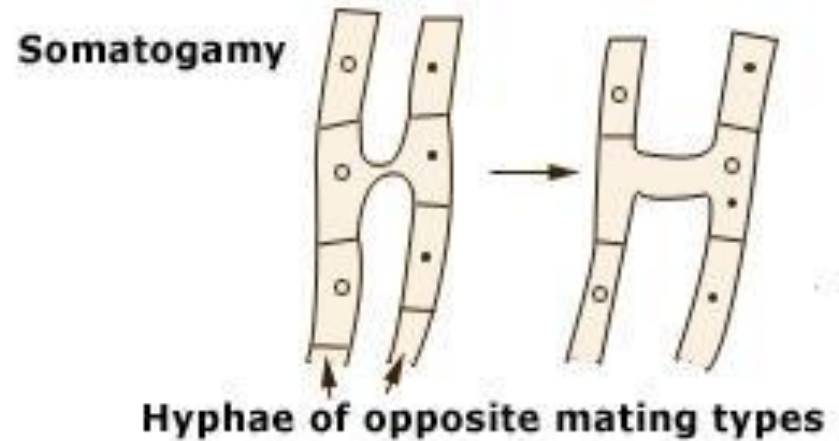
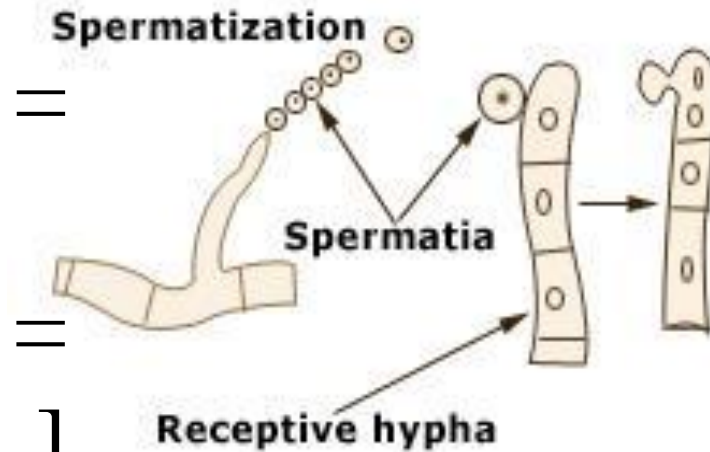
• **Heterothallic** – Dioecious or unisexual : male and female sex organs are formed on different hyphae developed from spores (*Mucor*, *Ustilago*, *Puccinia*) or Each individual thallus sexually self-sterile

Blakeslee discovered it in 1903 for the condition of sexual reproduction which he found in certain species of Mucorales.

- - & + = Blakeslee
- A & B = Shear & Dodge
- A & a = Tatum & Beadle

Producing male and female gametangia in different structures in some fungi. Gametes produced by one type of thallus are compatible only with gametes produced by the other type. Such fungi are said to be heterothallic.

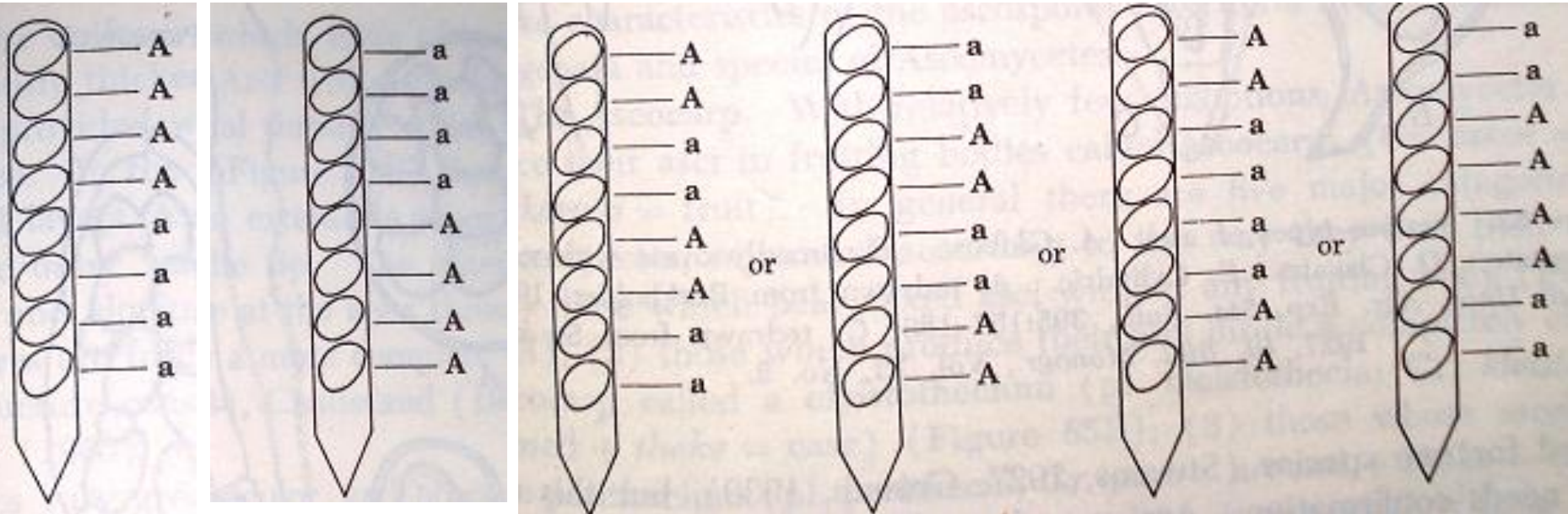
[Heteros
different
thallos
young shoot]
(Greek)

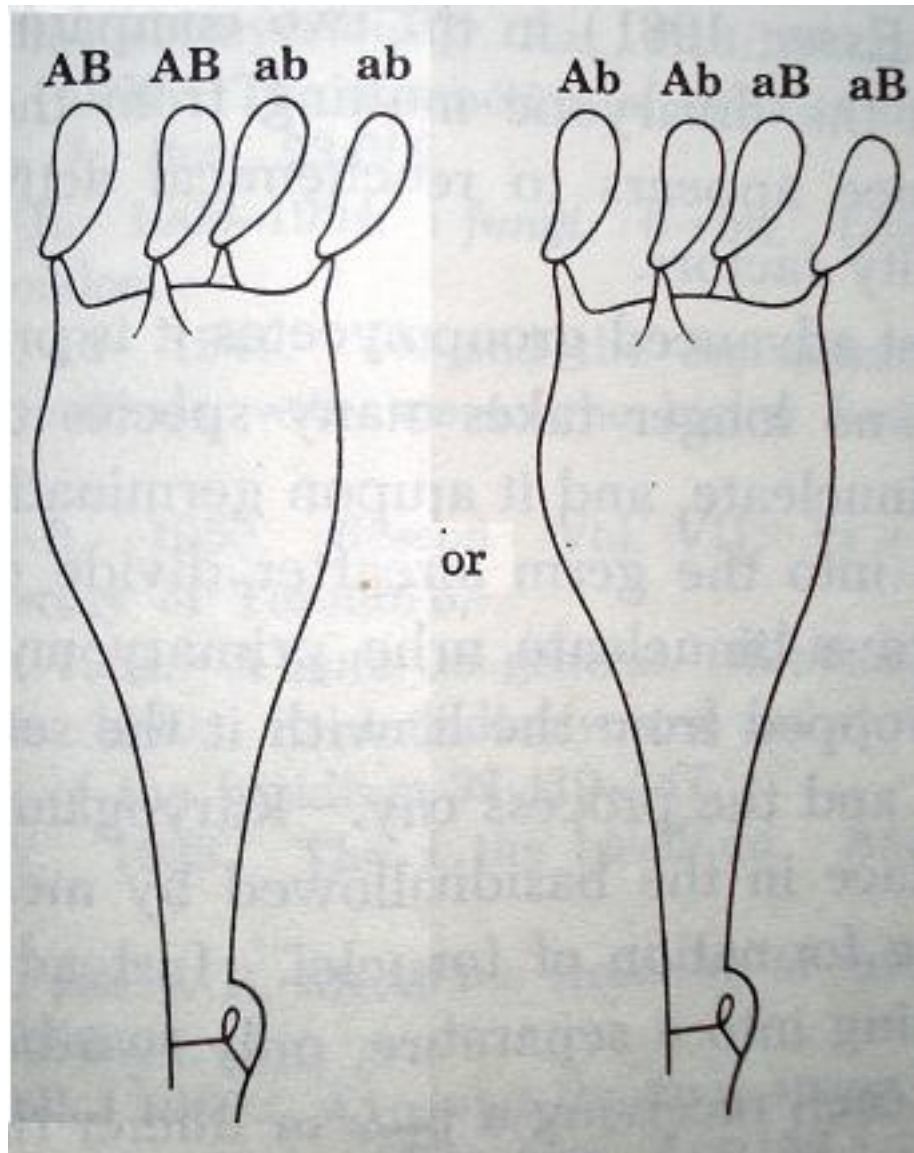


Conjugation is possible only through the interaction of two differing thalli.

Heterothallic

- Bipolar – thallus differing in genetic make up A and a
- Tetrapolar – Thallus consisting of four types Aa and Bb producing AaBb





Life Cycle of Mushroom

- The life cycle of a club fungus usually includes a long-lived dikaryotic mycelium.

