곰팡이 균사체기반 복합체소재, Fungal mycelium-based composite

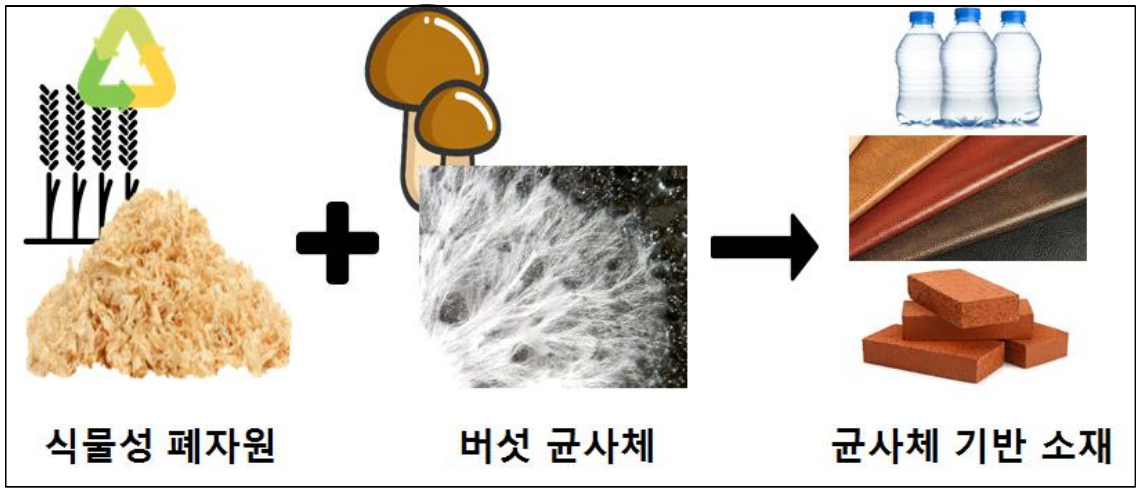


그림 1. 팡이 균사체기반 복합체소재의 기본개념 요약

Parts of a fungus and The mushroom life cycle

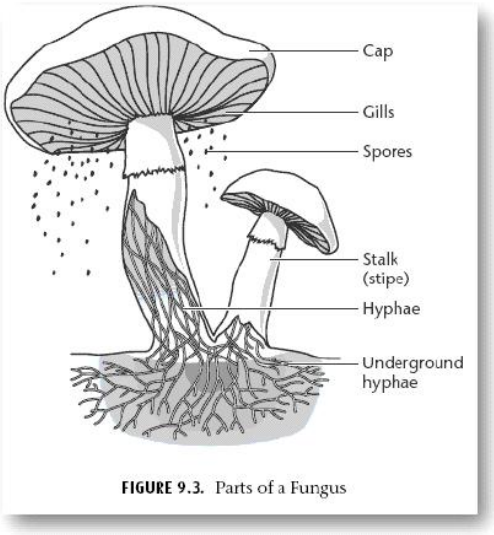
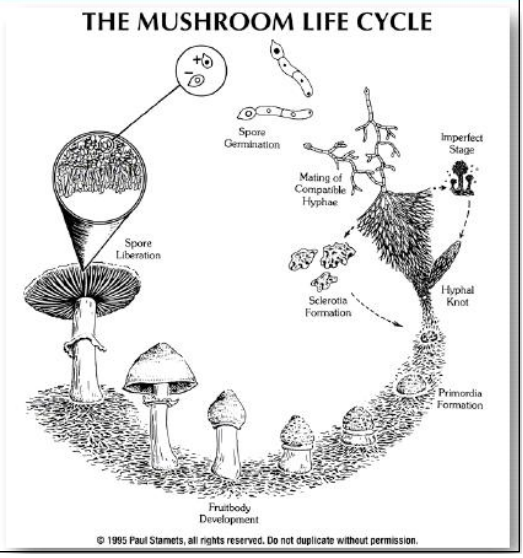


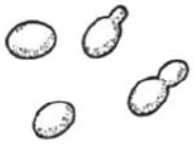
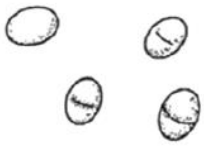
FIGURE 9.3. Parts of a Fungus



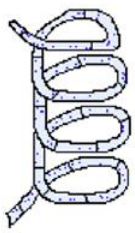
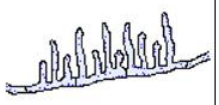
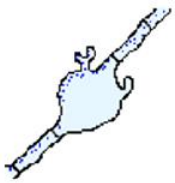
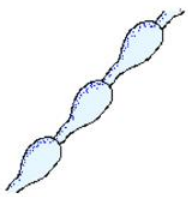
Hyphae & Mycelium

- Hyphae
  - The most common multicellular structures
  - The fundamental structures form which all other multicellular fungal structures are derived.
  - They consist of a series of elongated cells.
  - Cross walls (septa) occur within hyphae, dividing them into separate cells or cytoplasmic compartments.
  - They are classified morphologically as parallel hyphae and interwined hyphae.
- Mycelium
  - The massive quantities of hyphae produced by a fungus are collectively termed as mycelium (plural, mycelia).

The classification based on fungi growth

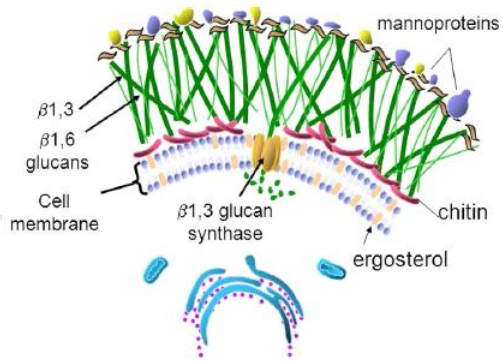
		
Blastoconidia formation	Fission formation	Pseudohypae
		
Coenocylic hyphae	Septate hyphae	Septate hypae with clamp connections

Types of hyphae according to formation

				
Spiral hyphae (Trichophyton mentagrophytes)	**Pectinate body** (Microsporum audouinii)	**Favic chandelier** (Trichophyton schoenleinii)	**Nodular organ** (Microsporum canis)	**Racquet hyphae** (Epidermophyton floccosum)

The main component of the cell wall

- Structural components
  - Chitin
  - Glucan
- Intrastructural components
  - Proteins
  - mannans



Fungal cell wall degrading chemicals

- Mannan
- Protein : 산이나 알칼리에 의하여 분해가 이루어 짐
- Glucan : 산을 이용하여 분해하며, sulfuric acid를 이용할 때 상대적으로 반응 속도가 높음
- β-glucan : β-glucan을 포름산과 함께 80~90℃ 교반기에서 30여분동안 반응하여 고분자-> 저분자 형태로 제조가 가능
- Chitin : 산을 이용하여 분해

Enzyme for leather processing

- Bating (효해, 배팅)
  - 제혁 준비작업에서 석회에 절인 후에 하는 공정. 가죽 중의 산화칼슘 외에 제혁상 불필요하다고 간주되는 단백질(albumin, globulin)을 제거
  - Alkaline and acidic proteases
- Soaking (담금, 소킹)
  - A mixture of protease and lipase (alkaline and acidic)
- Un-hairing
  - Proteases for un-hairing in high alkaline pH conditions
- Degreasing
  - Lipase in acidic, neutral and alkaline conditions