CLAIMS

1. A composite mycelium material, comprising:

a. a cultivated mycelium material comprising one or more masses of branching hyphae, wherein the one or more masses of branching hyphae is disrupted; and

b. a bonding agent, wherein the bonding agent is selected from the group consisting of a vinyl acetate-ethylene (VAE) copolymer, a vinyl acetate-acrylic copolymer, a polyamide-epichlorohydrin resin (PAE), a copolymer, transglutaminase, citric acid, genipin, alginate, gum arabic, latex, a natural adhesive, and a synthetic adhesive.

2. The composite mycelium material of claim 1, wherein the bonding agent is a copolymer with a property selected from the group consisting of: a particle size of less than or equal to 1 μm, a sub-zero glass transition temperature, and self-crosslinking function.

3. The composite mycelium material of claim 1, wherein the bonding agent is a vinyl acetate-ethylene (VAE) copolymer.

4. The composite mycelium material of claim 1, wherein the bonding agent is a vinyl acetate-acrylic copolymer.

5. The composite mycelium material of claim 1, wherein the composite mycelium material further comprises a supporting material.

6. The composite mycelium material of claim 5, wherein the supporting material comprises a reinforcing material.

7. The composite mycelium material of claim 5, wherein the supporting material is selected from the group consisting of a mesh, a cheesecloth, a fabric, a knit textile, a woven textile, and a non-woven textile.

8. The composite mycelium material of claim 1, wherein the one or more masses of branching hyphae is disrupted by a mechanical action.

9. The composite mycelium material of claim 8, wherein the mechanical action comprises blending the one or more masses of branching hyphae.

10. The composite mycelium material of claim 8, wherein the mechanical action comprises breaking the one or more masses of branching hyphae.

11. The composite mycelium material of claim 1, wherein the composite mycelium material further comprises a dye.

12. The composite mycelium material of claim 11, wherein the dye is selected from the group consisting of an acid dye, a direct dye, a synthetic dye, a natural dye, and a reactive dye.

13. The composite mycelium material of claim 12, wherein the dye is a reactive dye.

14. The composite mycelium material of claim 11, wherein the composite mycelium material is colored with the dye and the color of the composite mycelium material is substantially uniform on one or more surfaces of the composite mycelium material.

15. The composite mycelium material of claim 11, wherein the dye is present throughout the interior of the composite mycelium material.

16. The composite mycelium material of claim 1, wherein the composite mycelium material further comprises a plasticizer.

17. The composite mycelium material of claim 16, wherein the plasticizer is selected from the group consisting of oil, glycerin, fatliquor, sorbitol, diethyloxyester dimethyl ammonium chloride, Tween 20, Tween 80, m-erythritol, water, glycol, triethyl citrate, water, acetylated monoglycerides, and epoxidized soybean oil.

18. The composite mycelium material of claim 17, wherein the plasticizer is a fatliquor.

19. The composite mycelium material of claim 1, wherein the composite mycelium material further comprises a finishing agent.

20. The composite mycelium material of claim 19, wherein the finishing agent is selected from the group consisting of urethane, wax, nitrocellulose, and a plasticizer.

21. The composite mycelium material of claim 1, wherein the composite mycelium material comprises a mechanical property.

22. A composite mycelium material, comprising:

a. a cultivated mycelium material comprising one or more masses of branching hyphae, wherein the one or more masses of branching hyphae is disrupted;

b. a bonding agent comprising a vinyl acetate-ethylene copolymer; and

c. a reactive dye.

23. A method of producing a composite mycelium material, the method comprising:

a. generating a cultivated mycelium material comprising one or more masses of branching hyphae;

b. disrupting the cultivated mycelium material comprising the one or more masses of branching hyphae; and

c. adding a bonding agent to the cultivated mycelium material; thus producing the composite mycelium material, wherein the bonding agent is selected from the group consisting of a vinyl acetate-ethylene (VAE) copolymer, a vinyl acetate-acrylic copolymer, a polyamide-epichlorohydrin resin (PAE), a copolymer, transglutaminase, citric acid, genipin, alginate, gum arabic, latex, a natural adhesive, and a synthetic adhesive.

24. A method, comprising:

a. generating a cultivated mycelium material;

b. pressing the cultivated mycelium material; and

c. contacting the pressed cultivated mycelium material with a solution comprising a bonding agent.

25. A composite mycelium material, comprising:

a. a pressed cultivated mycelium material; and

b. a bonding agent, wherein the bonding agent is selected from the group consisting of a vinyl acetate-ethylene (VAE) copolymer, a vinyl acetate-acrylic copolymer, a polyamide-epichlorohydrin resin (PAE), a copolymer, transglutaminase, citric acid, genipin, alginate, gum arabic, latex, a natural adhesive, and a synthetic adhesive.