CLAIMS

We Claim:

1. A biomat comprising filamentous fungal strain MK7 (ATCC Accession Deposit No. PTA-10698), wherein the biomat is 1 mm to 30 mm thick, and wherein the biomat is produced by a surface fermentation method comprising inoculating an artificial liquid medium with a biologically pure culture of filamentous fungi comprising MK7 and incubating the inoculated filamentous fungi to produce the biomat on the surface of the liquid medium, wherein the biomat comprises at least two structurally different cell layers in contact with each other, including an upper aerial hyphae layer in contact with the atmosphere during the surface fermentation and a lower layer in contact with the liquid media during the surface fermentation, wherein the lower layer has a higher fungal density than the aerial hyphae layer.

2. The biomat according to claim 1, wherein the biomat is produced by culturing the filamentous fungi to produce at least 50 g dry wt filamentous fungi/l media.

3. The biomat of claim 1, wherein the biomat is produced by culturing the filamentous fungi to produce at least 120 g dry wt filamentous fungi/l media.

4. The biomat of claim 1, wherein the biomat is produced by culturing the filamentous fungi to produce at least 180 g dry wt filamentous fungi/l media.

5. The biomat according to claim 1, wherein the biomat further comprises a transitional layer between the aerial hyphae layer and the lower layer.

6. The biomat according to claim 1, wherein the biomat has sufficient tensile strength and structural integrity to be lifted and moved by hand without tearing.

7. The biomat of claim 1, wherein the biomat has a protein content of at least 40% when the biomat has a moisture content of about 4.5%.

8. The biomat of claim 1, wherein the biomat has a lipid content of at least 39%.

9. The biomat of claim 1, wherein the biomat is between 5% and 20% solids.

10. The biomat of claim 1, wherein the ratio of thickness of the bottom layer to the thickness of the aerial hyphae layer is at least 0.41.

11. The biomat of claim 1, wherein the biomat has an average filament length of between 0.05 cm and 2 cm.

12. The biomat of claim 1, wherein the biomat comprises amino acids selected from tryptophan, cysteine, methionine, alanine, arginine, aspartic acid, glutamic acid, glycine, histidine, isoleucine, leucine, phenylalanine, proline, serine, threonine, lysine, tyrosine and valine produced by the filamentous fungi.

13. The biomat of claim 1, wherein the tensile strength of the biomat is at least 0.31 kg/cm^2.

14. The biomat according to claim 1, wherein the biomat is produced by culturing the filamentous fungi to produce at least 25 g dry wt filamentous fungi/l media.