CLAIMS

1. A method of obtaining melanin from a melanised invertebrate biomass, the method comprising:

rupturing the melanised invertebrate biomass to form a raw material;

demineralizing the raw material with an acidic solution to form a first solid fraction;

deproteinating the first solid fraction with a first sodium hydroxide solution having a concentration of between 0.5 M and 3 M to form a second solid fraction;

liberating the melanin from the second solid fraction with a second sodium hydroxide solution having a concentration of between 1 M and 6 M resulting in a supernatant comprising the melanin;

extracting the supernatant; and

precipitating the melanin from the supernatant with hydrochloric acid.

2. The method of claim 1 wherein the melanised invertebrate biomass IS a melanised Arthropoda phylum species.

3. The method of claim 1 wherein the melanised invertebrate biomass is *Hermetia illucens.*

4. The method of claim 1 wherein the melanised invertebrate biomass is an adult form of *Tenebrio molitor.*

5. The method of claim 1 wherein the melanised invertebrate biomass comprises cuticles from prepupal stages, empty pupae shells or spent adult stage.

6. The method of claim 1 wherein the acidic solution IS hydrochloric acid having a concentration of between 0.1 M and 3 M.

7. The method of claim 1 wherein the acidic solution is lactic acid having a concentration of between 1 % and 10 % w/w.

8. The method of claim 1 wherein the demineralizing comprises adding the acidic solution to the raw material to obtain a first mixture.

9. The method of claim 8 further comprising treating the first mixture for a first period of time at a first temperature of between 25 °C and 90 °C; and extracting the first solid fraction from the first mixture by filtration or centrifugation.

10. The method of claim 8 wherein adding the acidic solution is performed to obtain a first

solid-to-liquid ratio of between 1:10 and 1:100.

11. The method of claim 9 wherein the first period of time is between 1 hour and 24 hours.

12. The method of claim 9 further comprising washing the first solid fraction with water and receiving a first washing liquid, checking the first washing liquid for pH level, and rewashing the first solid fraction with water until the first washing liquid pH level is between 5 and 7.

13. The method of claim 1 wherein the first sodium hydroxide solution has a concentration of between 0.5 M and 1 M.

14. The method of claim 1 wherein the deproteinating comprises adding the first sodium hydroxide solution to the first solid fraction to obtain a second mixture.

15. The method of claim 14 wherein adding the first sodium hydroxide solution is performed to obtain a second solid-to-liquid ratio of between 1:10 and 1:30.

16. The method of claim 14 further comprising treating the second mixture for a second period of time at a second temperature between 25 °C and 90 °C; and extracting the second solid fraction from the second mixture by filtration or centrifugation.

17. The method of claim 16 wherein the second period of time is between 30 minutes and 5 hours.

18. The method of claim 16 further comprising the step of washing the second solid fraction with water and receiving a second washing liquid, checking the second washing liquid for pH level, and rewashing the second solid fraction with water until the second washing liquid pH level is between 7 to 9.

19. The method of claim 1 wherein the second sodium hydroxide solution has a concentration of between 1 M and 3 M.

20. The method of claim 1 wherein the melanin liberating comprises:

adding the second sodium hydroxide solution to the second solid fraction to obtain a third mixture; and

treating the third mixture for a third period of time at a third temperature of between 70 °C and 90 °C.

21. The method of claim 20 wherein adding the second sodium hydroxide solution is performed to obtain a third solid-to-liquid ratio of between 1:10 and 1:24.

22. The method of claim 20 wherein the third period of time is between **1** hour and 6 hours.