We claim:

1. A raw material composition for a thermoplastic product mixed with a microalgae, the raw material composition comprising:

a polyvinyl alcohol;

the microalgae in an amount of from 10% to 30% by weight based on the weight of the polyvinyl alcohol;

a compatibilizer in an amount of from 2% to 5% by weight based on the weight of the polyvinyl alcohol;

a plasticizer in an amount of from 20% to 30% by weight based on the weight of the polyvinyl alcohol;

a cross-linking agent in an amount of from 0% to 1.5% by weight based on the weight of the polyvinyl alcohol;

a processing aid in an amount of from 1% to 5% by weight based on the weight of the polyvinyl alcohol, wherein the processing aid is myristic acid, palmitic acid, stearic acid, or polyethylene oxide, and the stearic acid is not in the form of alkali metal stearate acid; and

a slipping agent in an amount of from 0.1% to 0.5% by weight based on the weight of the polyvinyl alcohol, wherein the slipping agent is alkali metal stearate acid.

2. The raw material composition according to claim 1, wherein further comprises a toughening agent in an amount of from 0.2% to 0.5% by weight based on the weight of the polyvinyl alcohol.

3. The raw material composition according to claim 1, wherein a degree of polymerization of the polyvinyl alcohol is between 300 and 2400.

4. The raw material composition according to claim 1, wherein a hydrolysis degree of the polyvinyl alcohol is between 88% and 99%.

5. The raw material composition according to claim 1, wherein a protein content of the microalgae is not less than 30%.

6. The raw material composition according to claim 1, wherein the microalgae is selected from *Spirulina* sp., *Chlorella* sp., *Nannochloropsis* sp., *Dunaliella* sp., *Tetraselmis* sp., or combinations thereof.

7. The raw material composition according to claim 1, wherein the plasticizer is a polyol.

8. The raw material composition according to claim 7, wherein the polyol is glycerol, polyethylene glycol, sorbitol, xylitol, mannitol, or combinations thereof.

9. The raw material composition according to claim 1, wherein the compatibilizer is gum rosin.

10. The raw material composition according to claim 1, wherein the cross-linking agent is boric acid, citric acid, adipic acid, succinic acid, or suberic acid.

11. The raw material composition according to claim 1, wherein the slipping agent comprises an alkali metal stearate.

12. A thermoplastic product mixed with a microalgae, made from the raw material composition according to any one of claims 1 to 11.

13. A method for preparing a thermoplastic product mixed with a microalgae, comprising the steps of:

mixing a polyvinyl alcohol, the microalgae, a compatibilizer, a plasticizer, a cross-linking agent, a processing aid, and a slipping agent to obtain a mixture, wherein the microalgae is present in an amount of from 10% to 30% by weight based on the weight of the polyvinyl alcohol, the compatibilizer is present in an amount of from 2% to 5%, the plasticizer in an amount of from 20% to 30%, the cross-linking agent in an amount of 0% to 1.5%, the processing aid in an amount of from 1% to 5%, and the slipping agent in an amount of from 0.1% to 0.5%, all percentages by weight based on the polyvinyl

alcohol, wherein the processing aid is myristic acid, palmitic acid, stearic acid, or polyethylene oxide, the stearic acid is not in the form of alkali metal stearate acid, and the slipping agent is alkali metal stearate acid;

drying the mixture;

granulating the mixture into pellets; and

forming the pellets into a product.