Claims

1. A method for preparing a *Gracilaria lemaneiformis* polysaccharide with significant hypolipidemic activity, comprising the following steps:

(1) washing, air-drying, crushing and sieving *Gracilaria lemaneiformis* to obtain *Gracilaria lemaneiformis* powder;

(2) adding an organic acid solution to the *Gracilaria lemaneiformis* powder; after pre-homogenization, extracting the *Gracilaria lemaneiformis* powder by dynamic high pressure microfluidization, neutralizing with a base and filtering to obtain a filter residue and an extract solution;

(3) performing ultrafiltration of the extract solution in step (2), discarding a permeate, and collecting a retentate;

(4) separating the retentate with an ion exchange resin, and concentrating a component with the highest hypolipidemic activity under vacuum to obtain a concentrated solution;

(5) mixing the concentrated solution with ethanol, standing and filtering to obtain a polysaccharide precipitation;

(6) drying the polysaccharide precipitation to obtain the *Gracilaria lemaneiformis* polysaccharide;

wherein the *Gracilaria lemaneiformis* polysaccharide has a molecular weight of 20-35 kDa and a sulfate group content of 20-28% by weight.

2. The method according to claim 1, characterized in that, the crushing and sieving step in step (1) comprises sieving by a 20-80 mesh sieve after crushing.

3. The method according to claim 1, characterized in that, the pH of the organic acid solution in step (2) is 2.0-4.0; the organic acid solution is a citric acid solution or a malic acid solution; and the mass of the organic acid solution in step (2) is 20-40 times of the mass of the *Gracilaria lemaneiformis* powder.

4. The method according to claim 1, characterized in that, parameters of the pre-homogenization in step (2) comprise 20-50 MPa, 1 - 3 min, and 1-2 times of homogenization; and control conditions for the dynamic high pressure microfluidization in step (2) comprise a microfluidization pressure of 120-180 MPa, an extraction temperature of 75-100°C, an extraction time of 80-160 min, and 1-2 times of extractions.

5. The method according to claim 1, characterized in that, the ultrafiltration in step (3) is performed by using an ultrafiltration membrane with a molecular weight cut-off of 1 kDa.

6. The method according to claim 1, characterized in that, a model of the ion exchange resin in step (4) is DEAE-fast flow or DEAE-52; and the concentrated solution obtained by vacuum concentration in step (4) has a volume of 1/10 - 1/5 of the volume of the retentate.

7. The method according to claim 1, characterized in that, the ethanol in step (5) has an amount of 60% - 90% of a total volume of the concentrated solution after mixing with the ethanol; and the standing in step (5) comprises standing at 2 - 8°C for 8 - 14 hours.

8. The method according to claim 1, characterized in that, the drying in step (6) comprises vacuum freeze drying or spray drying.

9. Use of the *Gracilaria lemaneiformis* polysaccharide according to any of claims 1 to 8 in the preparation of hypolipidemic drugs or health products.