CLAIMS

What is claimed is:

1. A method for producing a microbial oil, comprising:

inoculating a *Mortierellaalpina* strain into a fermentation medium for fermentation to obtain a fermentation product;

subjecting the fermentation product to extraction solvent followed by separation to obtain a solid phase, subjecting the solid phase to repeated extraction 4-7 times followed by filtration and separation to obtain oil phases; and

combining and desolventizing the oil phases to produce the microbial oil;

wherein the *Mortierellaalpina* strain has an accession number of GDMCC No. 60734;

the fermentation is performed at 27-31°C for 4-8 days under a ventilation rate of 0.5-1.1 vvm; and

the fermentation medium comprises a carbon source and a nitrogen source, and has a carbon-to-nitrogen ratio of (3-18):1.

2. The method according to claim 1, further comprising:

activating the *Mortierellaalpina* strain followed by expansion culture to produce a seed liquid; and

inoculating the seed liquid into the fermentation medium for the fermentation;

wherein the seed liquid is obtained through steps of:

(1) activating the *Mortierellaalpina* strain to obtain a spore suspension;

(2) inoculating the spore suspension obtained in step (1) into a seed culture medium in a shake flask for primary expansion culture; and

(3) inoculating a culture product in the shake flask into an expansion culture medium in a seed tank for secondary expansion culture to obtain the seed liquid;

the step (1) further comprises:

inoculating the *Mortierellaalpina* strain into a primary activation medium, and culturing the *Mortierellaalpina* strain at 25-30°C for 5-7 days to obtain primary activated spores;

inoculating the primary activated spores into a secondary activation medium, and culturing the primary activated spores at 25-30°C for 4-6 days to obtain mature spores and hyphae; and

preparing the spore suspension;

in step (2), the primary expansion culture is performed at 25-30°C for 5-8 days; and

in step (3), the secondary expansion culture is performed at 27-31°C for 1-2 days under a ventilation rate of 0.5-0.8 vvm.

3. The method according to claim 2, characterized in that the seed culture medium in the shake flask comprises 50-70 g/L of a carbon source and 15-25 g/L of a nitrogen source, and has a pH of 6.5-7.2; and

the expansion culture medium comprises a carbon source and a nitrogen source, and has a carbon-to-nitrogen ratio of (3-8):1.

4. The method according to claim 1 or 3, characterized in that the carbon source in the fermentation medium, the carbon source in the seed culture medium and the carbon source in the expansion culture medium are independently selected from the group consisting of glucose, starch and a combination thereof; and

the nitrogen source in the fermentation medium, the nitrogen source in the seed culture medium and the nitrogen source in the expansion culture medium are independently selected from the group consisting of peptone, yeast powder, yeast extract, a corn steep liquor powder and a combination thereof.

5. A *Mortierellaalpina* strain, characterized in that the *Mortierellaalpina* strain has an accession number of GDMCC No. 60734.

6. The *Mortierellaalpina* strain according to claim 5 for use in the production of a microbial oil, characterized in that

the microbial oil comprises a triglyceride; wherein Sn-2 fatty acids of the

triglyceride comprise 23% or more by weight of ARA; and

a weight percentage of ARA in the microbial oil is not less than 38%.