WHAT IS CLAIMED IS:

1. A method of fermentative production of massoia lactone comprising culturing an *Aureobasidium melanogenum* species in a culture medium for a period of time to yield more than 10 g/l of crude massoia lactone in a fermentation product, wherein the *Aureobasidium melanogenum* species is a strain that expresses no functional Aureobasidin A synthase gene mRNA when cultured and wherein the culture medium comprises:

about 10.0 g/l to about 15 g/l, preferably about 12.5 g/l KH_2PO_4, about 0.5 g/l to about 2.0 g/l, preferably about 1.0 g/l Na_2HPO_4, about 3.5 g/l to about 6.5 g/l, preferably about 5.0 g/l $(NH_4)_2SO_4$, about 1.0 g/l to about 4.0 g/l, preferably about 2.5 g/l $MgSO_4 \cdot 7H_2O$ and about 0.10 g/l to about 0.40 g/l, preferably about 0.25 g/l $CaCl_2 \cdot 2H_2O$;

at least two trace elements selected from the group consisting of Fe^{2+}, Cu^{2+}, Zn^{2+} and MoO_4^{2-}, wherein each trace element present in the culture medium is present in an amount from about 0.1 μM to about 1.0 mM, from about 1.0 μM to about 1.0 mM, from about 10.0 μM to about 1.0 mM,, or from about 100 μM to about 1.0 mM;

about 1.5 g/l to about 2.5 g/l, preferably from about 1.8 g/l to about 2.2 g/l, more preferably about 2 g/l urea; and

a carbon source selected from the group consisting of glucose, mannose, xylose and mixtures thereof, wherein the carbon source present in the culture medium from about 4% to about 12%, preferably from about 5% to about 12%, preferably from about 5% to about 11%, more preferably from about 5% to about 10%,

wherein the pH of the culture medium is from about 5.5 to about 6.5, preferably 6.0.

2. The method of claim 1, wherein the period of time is for about 4 days to about 12 days, preferably for about 5 days to about 12 days, preferably for about 5 days to about 11 days, preferably for about 6 days to about 11 days, more preferably for about 7 days to about 10 days.

3. The method of claim 1 or 2, wherein the yield of crude massoia lactone in the fermentation product is at least 11 g/l, or at least 12 g/l, or at least 13 g/l, or at least 14 g/l or at least 15 g/l.

4. The method of claim 1 or 2, wherein the yield of crude massoia lactone in the fermentation product is from about 10 g/l to about 25 g/l, or from about 10 g/l to about 24 g/l, or from about 10 g/l to about 23 g/l, or from about 10 g/l to about 22 g/l, or from about 10 g/l to about 21 g/l, or from about 10 g/l to about 20 g/l, or from about 10 g/l to about 19 g/l, or from about 10 g/l to about 18 g/l, or from about 10 g/l to about 17 g/l, or from about 10 g/l to about 16 g/l, or from about 10 g/l to about 15 g/l, or from about 10 g/l to about 14 g/l.

5. The method of any one of claims 1-4, wherein the *Aureobasidium melanogenum* strain is *Aureobasidium melanogenum* W5-2 deposited with Agricultural Research Culture Collection (NRRL) and assigned Accession Number NRRL 67063.

6. The method of claim 5, wherein the *Aureobasidium melanogenum GDP1* genomic sequence shares at least 97.5% identity over at least 98.5% of SEQ ID NO:2, preferably 99%-100% identity to over at least 98% of SEQ ID NO:2, and/or

wherein the *Aureobasidium melanogenum TEF1A* genomic sequence shares at least 98% identity over at least 94% of SEQ ID NO:8, preferably 99%-100% identity to over at least 99% of SEQ ID NO:8, and/or

wherein the *Aureobasidium melanogenum RBP1* genomic sequence shares at least 91% identity over at least 92% of SEQ ID NO:10, preferably 96%-100% identity to over at least 98% of SEQ ID NO:10.

7. The method of any one of claims 1-6, which further comprises hydrolyzing the fermentation product by a strong inorganic acid and purifying the massoia lactone from the fermentation product.

8. The method of any one of claims 1-7, wherein the fermentation product is substantially free of contaminant 3-hydroxyl delta-decalactone (3-hydroxydecan-5-olide).

9. A culture for the fermentative production of massoia lactone comprising an *Aureobasidium melanogenum* species in a culture medium, wherein the *Aureobasidium melanogenum*

species is a strain that expresses no functional Aureobasidin A synthase gene mRNA when cultured and wherein the culture medium comprises:

about 10.0 g/l to about 15 g/l, preferably about 12.5 g/l KH_2PO_4, about 0.5 g/l to about 2.0 g/l, preferably about 1.0 g/l Na_2HPO_4, about 3.5 g/l to about 6.5 g/l, preferably about 5.0 g/l $(NH_4)_2SO_4$, about 1.0 g/l to about 4.0 g/l, preferably about 2.5 g/l $MgSO_4 \cdot 7H_2O$ and about 0.10 g/l to about 0.40 g/l, preferably about 0.25 g/l $CaCl_2 \cdot 2H_2O$;

at least two trace elements selected from the group consisting of Fe^{2+}, Cu^{2+}, Zn^{2+} and MoO_4^{2-}, wherein each trace element present in the culture medium is present in an amount from about 0.1 μM to about 1.0 mM, from about 1.0 μM to about 1.0 mM, from about 10.0 μM to about 1.0 mM,, or from about 100 μM to about 1.0 mM;

about 1.5 g/l to about 2.5 g/l, preferably from about 1.8 g/l to about 2.2 g/l, more preferably about 2 g/l urea; and

a carbon source selected from the group consisting of glucose, mannose, xylose and mixtures thereof, wherein the carbon source present in the culture medium from about 4% to about 12%, preferably from about 5% to about 12%, preferably from about 5% to about 11%, more preferably from about 5% to about 10%,

wherein the pH of the culture medium is from about 5.5 to about 6.5, preferably 6.0.

10. The culture of claim 9, wherein the *Aureobasidium melanogenum* strain is *Aureobasidium melanogenum* W5-2 deposited with Agricultural Research Culture Collection (NRRL) and assigned Accession Number NRRL 67063.

11. The culture of claim 10, wherein the *Aureobasidium melanogenum GDP1* genomic sequence shares at least 97.5% identity over at least 98.5% of SEQ ID NO:2, preferably 99%-100% identity to over at least 98% of SEQ ID NO:2, and/or

wherein the *Aureobasidium melanogenum TEF1A* genomic sequence shares at least 98% identity over at least 94% of SEQ ID NO:8, preferably 99%-100% identity to over at least 99% of SEQ ID NO:8, and/or

wherein the *Aureobasidium melanogenum RBP1* genomic sequence shares at least 91% identity over at least 92% of SEQ ID NO:10, preferably 96%-100% identity to over at least 98% of SEQ ID NO:10.

12. The culture of any one of claims 9-11, further comprising more than 10 g/l of massoia lactone.

13. The culture of claim 12, wherein the amount of crude massoia lactone is at least 11 g/l, or at least 12 g/l, or at least 13 g/l, or at least 14 g/l or at least 15 g/l.

14. The culture of claim 12, wherein the amount of crude massoia lactone is from about 10 g/l to about 25 g/l, or from about 10 g/l to about 24 g/l, or from about 10 g/l to about 23 g/l, or from about 10 g/l to about 22 g/l, or from about 10 g/l to about 21 g/l, or from about 10 g/l to about 20 g/l, or from about 10 g/l to about 19 g/l, or from about 10 g/l to about 18 g/l, or from about 10 g/l to about 17 g/l, or from about 10 g/l to about 16 g/l, or from about 10 g/l to about 15 g/l, or from about 10 g/l to about 14 g/l.