Enhancement of lycopene synthesis by *Brassica trispora* by low frequency alternating magnetic field

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Figure S1: Lycopene standard curve.

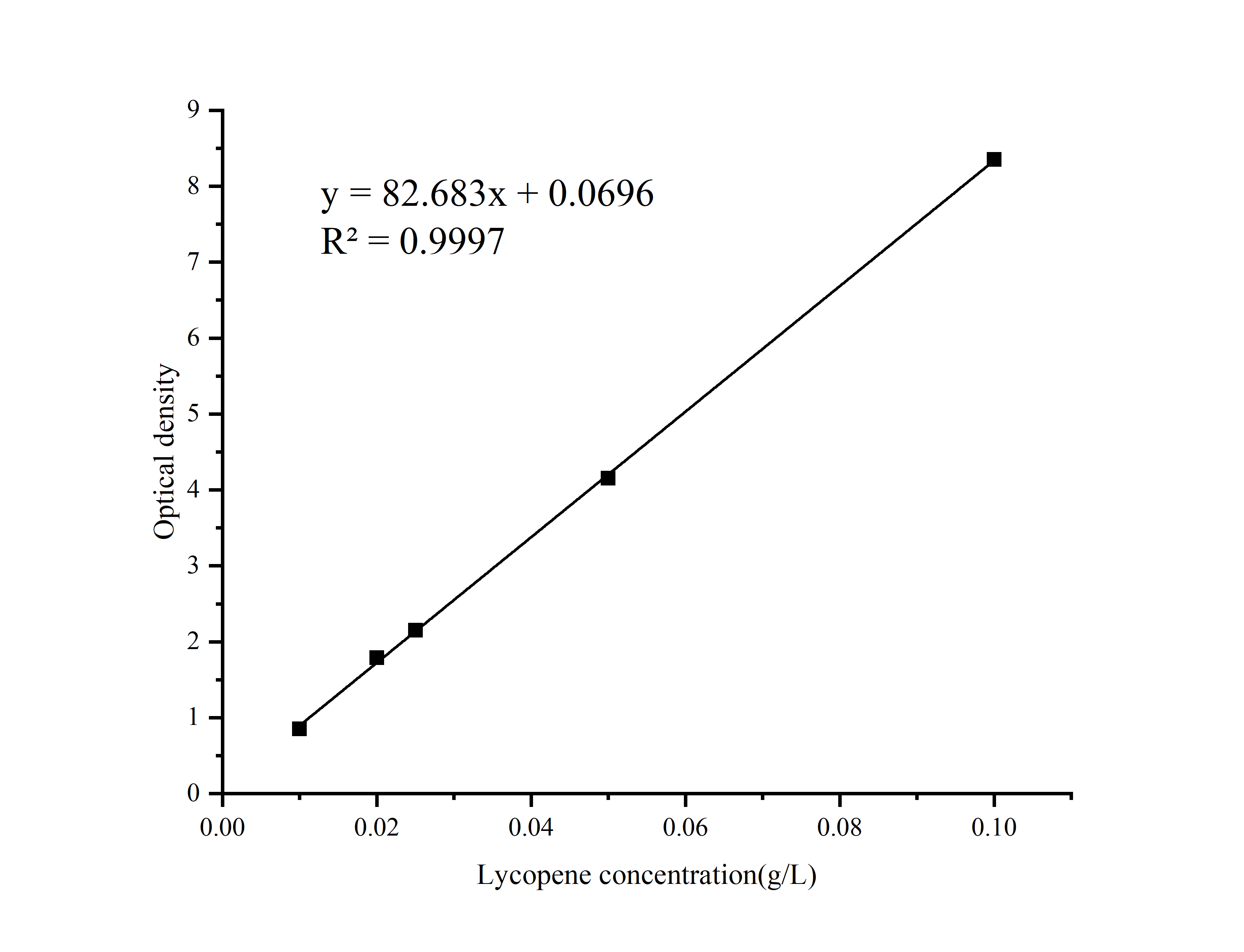


Table S1: effect of magnetic field intensity on lycopene yield.

|  |  |  |
| --- | --- | --- |
| Magnetic field intensity(mT) | Lycopene production(mg/L) | |
| AVG | SD |
| 0 | 466.2c | 32.2 |
| 0.2 | 597.2c | 33.7 |
| 0.5 | 870.2a | 45.5 |
| 0.7 | 658.2b | 24.8 |
| 1 | 387.5d | 26.3 |

Note :The lowercase alphabet with different right shoulder in the same column showed significant differ-ence (p<0.05); AVG:average value;SD:Standard Deviation.

Table S2：fermentation curve of *Brassica trispora* under the optimal magnetic field conditions.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Time(h) | Biomass(g/L) | | | | Lycopene production(mg/L) | | | |
| Control | | Treatment | | Control | | Treatment | |
| AVG | SD | AVG | SD | AVG | SD | AVG | SD |
| 48 | 31.2 | 3.5 | 31.2 | 3.5 | 193.6 | 33.5 | 193.6 | 33.5 |
| 72 | 48.5 | 2.8 | 43 | 2.5 | 283.3 | 47.2 | 438.4\*\* | 51.5 |
| 96 | 59.6 | 4.5 | 54 | 4.7 | 367.8 | 52.6 | 857.8\*\* | 69.7 |
| 120 | 68.2 | 2.4 | 66 | 2.3 | 453.2 | 68.3 | 1421.2\*\* | 84.9 |
| 144 | 72.1 | 2.3 | 70 | 3.9 | 466.4 | 72.6 | 1473.6\*\* | 99.2 |
| 168 | 72.5 | 3.9 | 70 | 3.2 | 467.8 | 77.2 | 1477.8\*\* | 102.3 |

Note:\*\*means extremely significant (p< 0.01) difference between the control group and the magnetic treatment group;AVG:average value;SD:Standard Deviation.

Table S3：The effect of magnetic fields on ROS-related enzyme activity in the lycopene synthesis pathway of *Brassica trispora*.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Time(h) | SOD activity(U/mg) | | | | CAT activity(U/mg) | | | |
| Control | | Treatment | | Control | | Treatment | |
| AVG | SD | AVG | SD | AVG | SD | AVG | SD |
| 48 | 18.3 | 2.1 | 18.3 | 2.1 | 13.2 | 1.9 | 13.2 | 1.9 |
| 72 | 23.3 | 1.2 | 26.5 | 1.3 | 15.4 | 1.2 | 18.4 | 1.1 |
| 96 | 26.2 | 1.3 | 30.3 | 1.1 | 18.3 | 2.1 | 24.1 | 1.9 |
| 120 | 32.1 | 1.4 | 35.2 | 1.2 | 23.3 | 1.8 | 29.3 | 1.9 |
| 144 | 29.2 | 1.1 | 31.3 | 1.4 | 19.2 | 2.2 | 24.1 | 1.6 |

Note:AVG:average value;SD:Standard Deviation.

Table S4：The effect of magnetic fields on crucial enzymes activity in the lycopene synthesis pathway of *Brassica trispora*.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Time(h) | PDS activity(U/mg) | | | |
| Control | | Treatment | |
| AVG | SD | AVG | SD |
| 48 | 13.2 | 1.9 | 13.2 | 1.9 |
| 72 | 15.4 | 1.2 | 18.4 | 1.1 |
| 96 | 18.3 | 2.1 | 24.1 | 1.9 |
| 120 | 23.3 | 1.8 | 29.3 | 1.7 |
| 144 | 19.2 | 2.2 | 24.1 | 1.6 |

Note:AVG:average value;SD:Standard Deviation.

Table S5：The effect of magnetic fields on intracellular ROS in the lycopene synthesis pathway of *Brassica trispora*.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Time(h) | ROS(FI/μg) | | | |
| Control | | Treatment | |
| AVG | SD | AVG | SD |
| 48 | 2.1 | 0.12 | 2.1 | 0.12 |
| 72 | 3.8 | 0.15 | 2.5 | 0.13 |
| 96 | 4.4 | 0.23 | 3.1 | 0.24 |
| 120 | 4.9 | 0.25 | 3.6 | 0.26 |
| 144 | 5.2 | 0.28 | 4.4 | 0.29 |

Note:AVG:average value;SD:Standard Deviation.

Table S6：The effect of magnetic fields on cellular membrane permeability in the lycopene synthesis pathway of *Brassica trispora*.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Time(h) | Relative conductivity(%) | | | |
| Control | | Treatment | |
| AVG | SD | AVG | SD |
| 48 | 32.1 | 1.4 | 32.1 | 1.4 |
| 72 | 43.3 | 2.8 | 40.2 | 2.1 |
| 96 | 55.4 | 3.4 | 48.8 | 2.3 |
| 120 | 69.3 | 2.6 | 57.2 | 3.7 |
| 144 | 80.1 | 3.7 | 66.7 | 4.5 |

Note:AVG:average value;SD:Standard Deviation.