

Supplementary Materials

Evaluation of Semi-Solid-State Fermentation of *Elaeocarpus serratus* L. Leaves and Black Soymilk by *Lactobacillus plantarum* on Bioactive Compounds and Antioxidant Capacity

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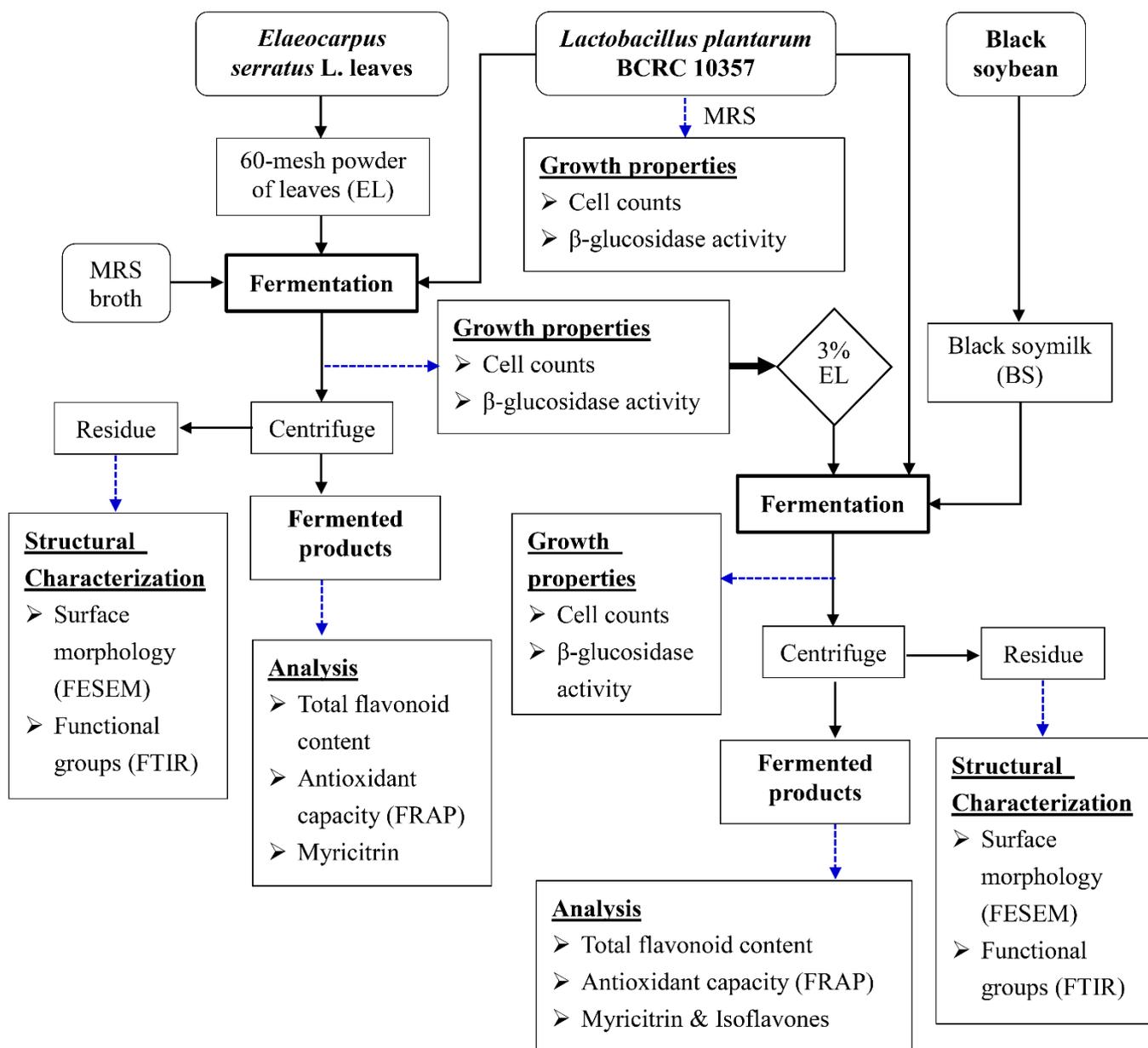


Figure S1. The scheme summarizing the experimental steps, methods, and analysis of this study.

Table S1. Comparison of viable cell counts of *L. plantarum* BCRC 10357 for various %EL in MRS during 48 h of fermentation ¹.

| Fermentation time (h) | Viable cell counts (log CFU/ml) | | | | |
|-----------------------|---------------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| | Control | 0.5% EL | 1% EL | 3% EL | 5% EL |
| 0 | 7.69 ± 0.01 ^{Ca} | 7.59 ± 0.04 ^{Cab} | 7.62 ± 0.07 ^{Cab} | 7.57 ± 0.08 ^{Bb} | 7.65 ± 0.04 ^{Cab} |
| 12 | 9.58 ± 0.02 ^{Aab} | 9.57 ± 0.10 ^{Aab} | 9.66 ± 0.02 ^{Aa} | 9.51 ± 0.05 ^{Ab} | 9.39 ± 0.02 ^{Bc} |
| 24 | 9.64 ± 0.04 ^{Aab} | 9.73 ± 0.10 ^{Aa} | 9.72 ± 0.07 ^{Aa} | 9.63 ± 0.03 ^{Aab} | 9.55 ± 0.04 ^{Ab} |
| 36 | 8.47 ± 0.08 ^{Bbc} | 8.29 ± 0.62 ^{Bc} | 9.05 ± 0.52 ^{Bab} | 9.43 ± 0.33 ^{Aa} | 9.56 ± 0.04 ^{Aa} |
| 48 | 7.78 ± 0.10 ^{Cb} | 7.43 ± 0.22 ^{Cb} | 7.40 ± 0.33 ^{Cb} | 7.53 ± 0.39 ^{Bb} | 9.52 ± 0.03 ^{Aa} |

¹ The data were expressed as mean ± standard deviations ($n = 3$). Different superscript uppercase letters at the same columns were significantly different ($p < 0.05$) by Duncan's multiple range test. Different superscript lower-case letters at the same row were significantly different ($p < 0.05$) by Duncan's multiple range test.

Table S2. Comparison of β -glucosidase activity of *L. plantarum* BCRC 10357 for various %EL in MRS during 48 h of fermentation ¹.

| Fermentation time (h) | β -Glucosidase activity (U/ml) | | | | |
|-----------------------|--------------------------------------|-----------------------------|----------------------------|----------------------------|-----------------------------|
| | Control | 0.5% EL | 1% EL | 3% EL | 5% EL |
| 0 | 0.00 ± 0.00 ^{Da} | 0.00 ± 0.00 ^{Ca} | 0.00 ± 0.00 ^{Ca} | 0.00 ± 0.00 ^{Ba} | 0.00 ± 0.00 ^{Da} |
| 12 | 16.56 ± 1.02 ^{Aa} | 12.56 ± 1.69 ^{Bbc} | 9.21 ± 0.36 ^{Bd} | 12.94 ± 0.69 ^{Ab} | 10.45 ± 1.51 ^{Bcd} |
| 24 | 15.47 ± 0.13 ^{Bab} | 14.61 ± 1.72 ^{Ab} | 18.36 ± 2.38 ^{Aa} | 14.16 ± 1.35 ^{Ab} | 14.48 ± 2.20 ^{Ab} |
| 36 | 2.33 ± 0.15 ^{Cc} | 0.00 ± 0.00 ^{Cd} | 0.00 ± 0.00 ^{Cd} | 13.71 ± 0.94 ^{Aa} | 7.32 ± 1.07 ^{Cb} |
| 48 | 0.05 ± 0.09 ^{Db} | 0.00 ± 0.00 ^{Cb} | 0.00 ± 0.00 ^{Cb} | 0.00 ± 0.00 ^{Bb} | 5.89 ± 2.06 ^{Ca} |

¹ The data were expressed as mean ± standard deviations ($n = 3$). Different superscript uppercase letters at the same columns were significantly different ($p < 0.05$) by Duncan's multiple range test. Different superscript lower-case letters at the same row were significantly different ($p < 0.05$) by Duncan's multiple range test.

Table S3. Comparison of total flavonoids content (TFC) and ferric reducing antioxidant power (FRAP) in fermented product (FP) for various %EL in MRS during 48 h of fermentation by *L. plantarum* BCRC 10357¹.

| Item | Fermentation time (h) | Ratio of EL | | | |
|---|-----------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| | | 0.5% EL | 1% EL | 3% EL | 5% EL |
| Bioactive Compounds TFC ($\mu\text{g-RE/g-FP}$) | 0 | 207.10 \pm 56.84 ^b | 225.52 \pm 76.63 ^b | 246.39 \pm 38.11 ^b | 437.38 \pm 54.87 ^c |
| | 24 | 1215.60 \pm 208.62 ^a | 1205.06 \pm 195.24 ^a | 2257.94 \pm 472.77 ^a | 1682.26 \pm 296.09 ^b |
| | 48 | 1030.28 \pm 26.13 ^a | 1167.36 \pm 104.28 ^a | 1865.31 \pm 155.87 ^a | 2533.41 \pm 208.85 ^a |
| Antioxidant Capacity FRAP (mg-TRE/g-FP) | 0 | 1.76 \pm 0.31 ^b | 1.78 \pm 0.45 ^b | 1.69 \pm 0.36 ^b | 2.00 \pm 0.09 ^b |
| | 24 | 6.38 \pm 0.41 ^a | 8.30 \pm 0.56 ^a | 9.61 \pm 1.37 ^a | 7.33 \pm 1.51 ^a |
| | 48 | 6.91 \pm 0.96 ^a | 7.70 \pm 0.83 ^a | 8.43 \pm 0.87 ^a | 9.11 \pm 0.80 ^a |

¹ The data were expressed as mean \pm standard deviations ($n = 3$). Different superscript letters at the same columns were significantly different ($p < 0.05$) by Duncan's multiple range test.

Table S4. Comparison of myricitrin content in fermented product (FP) for various %EL in MRS during 48 h of fermentation by *L. plantarum* BCRC 10357¹.

| Bioactive Compounds | Fermentation time (h) | Ratio of EL | | | |
|--------------------------------------|-----------------------|---------------------------------|---------------------------------|-----------------------------------|-----------------------------------|
| | | 0.5% EL | 1% EL | 3% EL | 5% EL |
| Myricitrin ($\mu\text{g/g-FP}$) | 0 | 34.38 \pm 12.07 ^c | 49.96 \pm 12.28 ^c | 115.03 \pm 20.79 ^b | 159.61 \pm 13.53 ^a |
| | 24 | 232.22 \pm 48.65 ^c | 339.53 \pm 51.83 ^c | 1126.70 \pm 237.46 ^a | 697.96 \pm 127.82 ^b |
| | 48 | 222.16 \pm 18.35 ^c | 317.58 \pm 47.09 ^c | 1002.41 \pm 197.68 ^b | 1425.33 \pm 108.67 ^a |

¹ The data were expressed as mean \pm standard deviations ($n = 3$). Different superscript letters at the same rows were significantly different ($p < 0.05$) by Duncan's multiple range test.

Table S5. Comparison of total flavonoids content (TFC), myricitrin and ferric reducing antioxidant power (FRAP) in fermented product extract (FPE) for 3%EL in MRS and 3%EL in black soymilk (BSEL) during 48 h of fermentation by *L. plantarum* BCRC 10357¹.

| Fermentation medium | Fermentation time (h) | TFC ($\mu\text{g-RE/g-FPE}$) | Myricitrin ($\mu\text{g/g-FPE}$) | FRAP (mg-TRE/g-FPE) |
|---------------------|-----------------------|------------------------------------|---------------------------------------|-----------------------------------|
| 3% EL | 0 | 2630.42 \pm 708.80 ^b | 1223.85 \pm 325.82 ^b | 17.89 \pm 4.74 ^a |
| | 24 | 4052.12 \pm 254.76 ^a | 2022.36 \pm 220.53 ^{ab} | 17.42 \pm 1.91 ^a |
| | 48 | 4106.67 \pm 640.33 ^a | 2222.91 \pm 623.49 ^a | 18.59 \pm 3.40 ^a |
| BSEL | 0 | 8670.89 \pm 1786.51 ^a | 1426.61 \pm 119.96 ^b | 27.18 \pm 2.39 ^a |
| | 24 | 9267.88 \pm 1964.09 ^a | 2817.17 \pm 435.51 ^a | 27.83 \pm 3.01 ^a |
| | 48 | 9643.64 \pm 1120.21 ^a | 2297.06 \pm 328.35 ^a | 26.98 \pm 2.21 ^a |

¹ The data were expressed as mean \pm standard deviations ($n = 3$). Different superscript letters at the same columns were significantly different ($p < 0.05$) by Duncan's multiple range test.