Supplementary data

Neuroprotective Effect of the Combined Extract of *Mentha piperita* and *Cornus officinalis* Against Neuronal Cell Death and Scopolamine-Induced Memory Impairment

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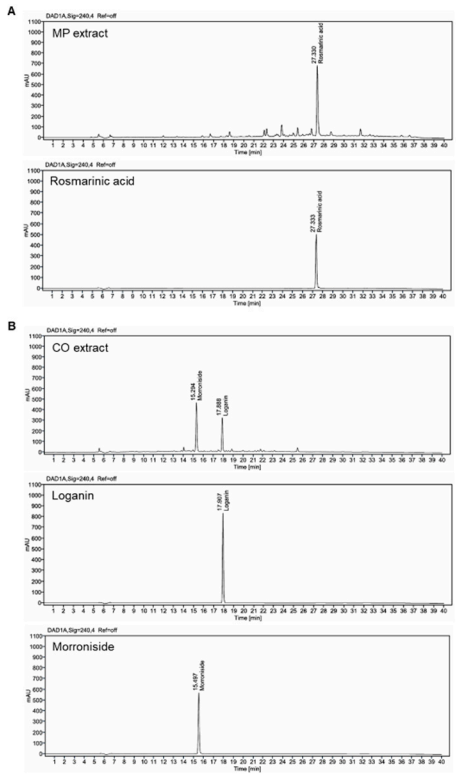


Figure S1. High-performance liquid chromatography with diode-array detection (HPLC-DAD) of *Mentha piperita* (MP) and *Cornus officinalis* (CO) extracts with their respective standards. (A) HPLC chromatogram of MP extract and rosmarinic acid standard. (B) HPLC chromatogram of CO extract with loganin and morroniside standards.

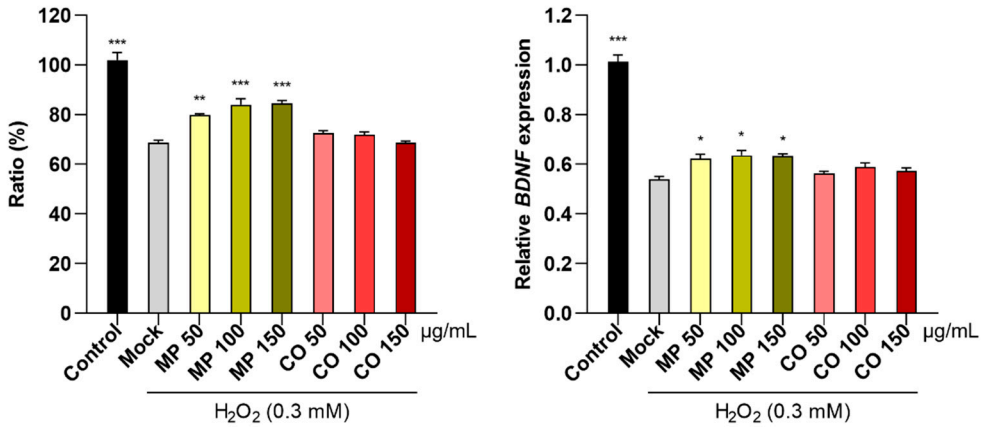


Figure S2. Effects of *Mentha piperita* (MP) and *Cornus officinalis* (CO) single extracts on cell viability and *BDNF* mRNA expression in H_2O_2-exposed SK-N-SH cells. Cells were pretreated with MP or CO extract at concentrations of 50, 100, or 150 μg/mL for 1 h and then exposed to 0.3 mM H_2O_2 for an additional 24 h. (A) Cell viability was assessed using a commercial assay kit. (B) *BDNF* mRNA expression levels were quantified using qRT-PCR. Data are presented as mean ± standard error of the mean. One-way analysis of variance (ANOVA) was performed, followed by Tukey's honest significant difference post hoc test ($^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$ vs. Mock). Control: untreated cells. Mock: 0.3 mM H_2O_2 only.

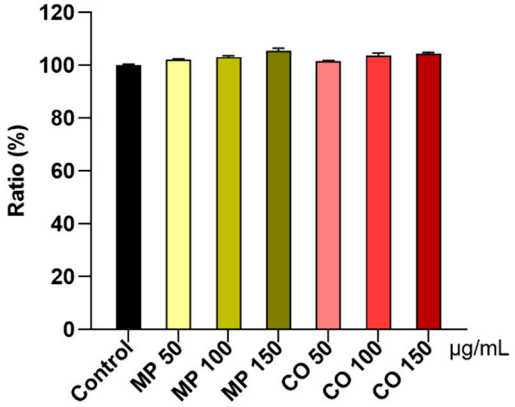


Figure S3. Non-cytotoxicity assessment of *Mentha piperita* (MP) and *Cornus officinalis* (CO) single extracts in SK-N-SH cells. SK-N-SH cells were treated with MP or CO alone (50, 100, and 150 μg/mL) for 25 h, and cell viability was measured using a commercial assay kit. Data are presented as mean ± standard error of the mean. One-way analysis of variance (ANOVA) was performed, followed by Tukey's honest significant difference post hoc test. Control: untreated cells.

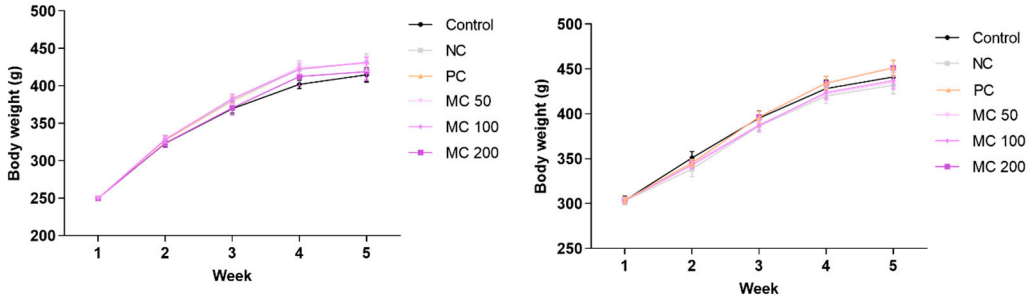


Figure S4. Body weight changes during behavioral testing. Rats received oral MC (50, 100, or 200 mg/kg/day) or PS (50 mg/kg/day) for 28 days. Body weight was measured weekly throughout the study. The left panel shows body weight changes during the passive avoidance test experiment. The right panel shows body weight changes during the Morris water maze test experiment. No significant differences were observed among treatment groups in either experiment. Data are presented as mean ± standard error of the mean (n = 5 per group).

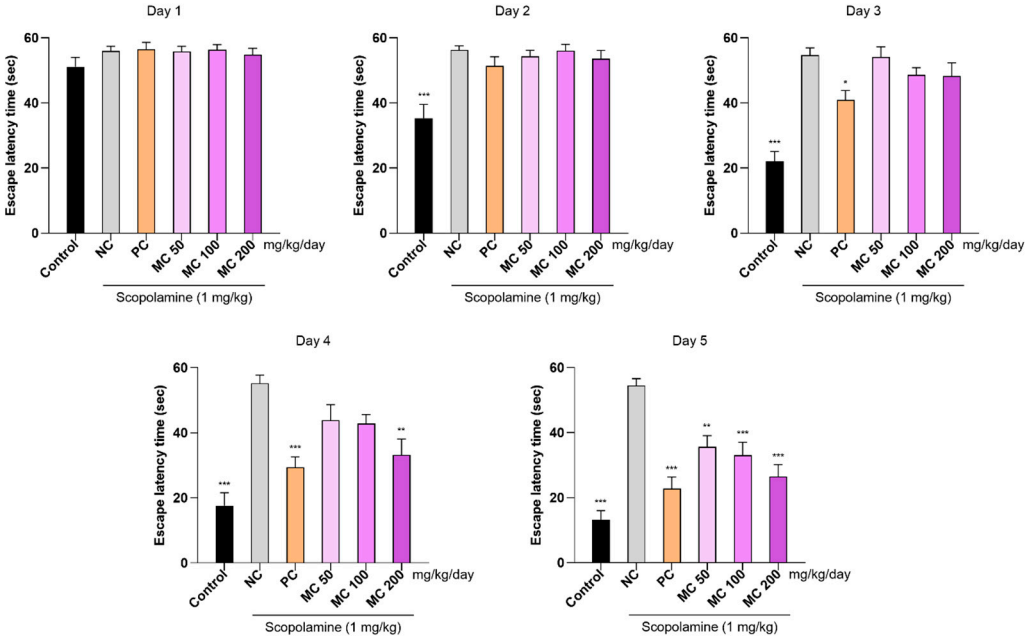


Figure S5. Escape latency during Morris water maze training. Rats received oral MC (50, 100, or 200 mg/kg/day) or PS (50 mg/kg/day) for 28 days. Escape latency was recorded daily during the training (days 1–5) with scopolamine (1 mg/kg, i.p.) administered 30 min before each session. Bar graphs represent escape latency on each training day (days 1–5), allowing comparison of acquisition performance across groups. Data are presented as mean ± standard error of the mean (n = 5 per group). One-way analysis of variance (ANOVA) was performed, followed by Tukey's honest significant difference post hoc test ($^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$ vs. NC). NC: Negative control, PC: positive control (Phosphatidylserine), MC: Combination of *Mentha piperita* and *Cornus officinalis* (6:4).

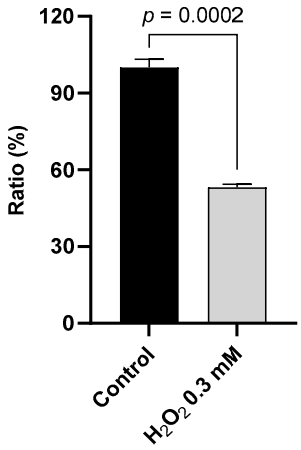


Figure S6. Determination of the H_2O_2 condition (0.3 mM) used for oxidative injury in SK-N-SH cells. SK-N-SH cells were exposed to H_2O_2 (0.3 mM) for 24 h, and cell viability was measured using a commercial assay kit. In this study, 0.3 mM H_2O_2 produced an approximately 50% reduction in cell viability (IC_{50}-approximate condition). Data are presented as mean ± standard error of the mean. Statistical significance was assessed using Student's t-test. Control: untreated cells.

Raw western blotting data

