

supplementary materials

Table S1 Elemental analysis of fullerol

| Weight (mg) | Number | N Area | C Area | H Area | S Area | N (%) | C (%) | H (%) | S (%) |
|-------------|--------|--------|--------|--------|--------|-------|-------|-------|-------|
| 1.6660 | 1 | 0 | 19 038 | 3 829 | 53 | 0.00 | 37.97 | 2.453 | 0.186 |

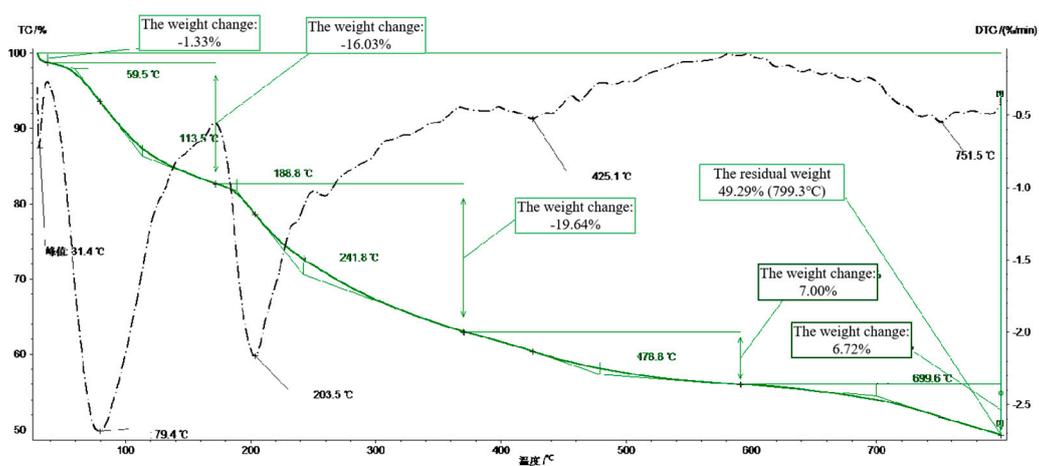


Figure S1. TG-GTA of fullerol

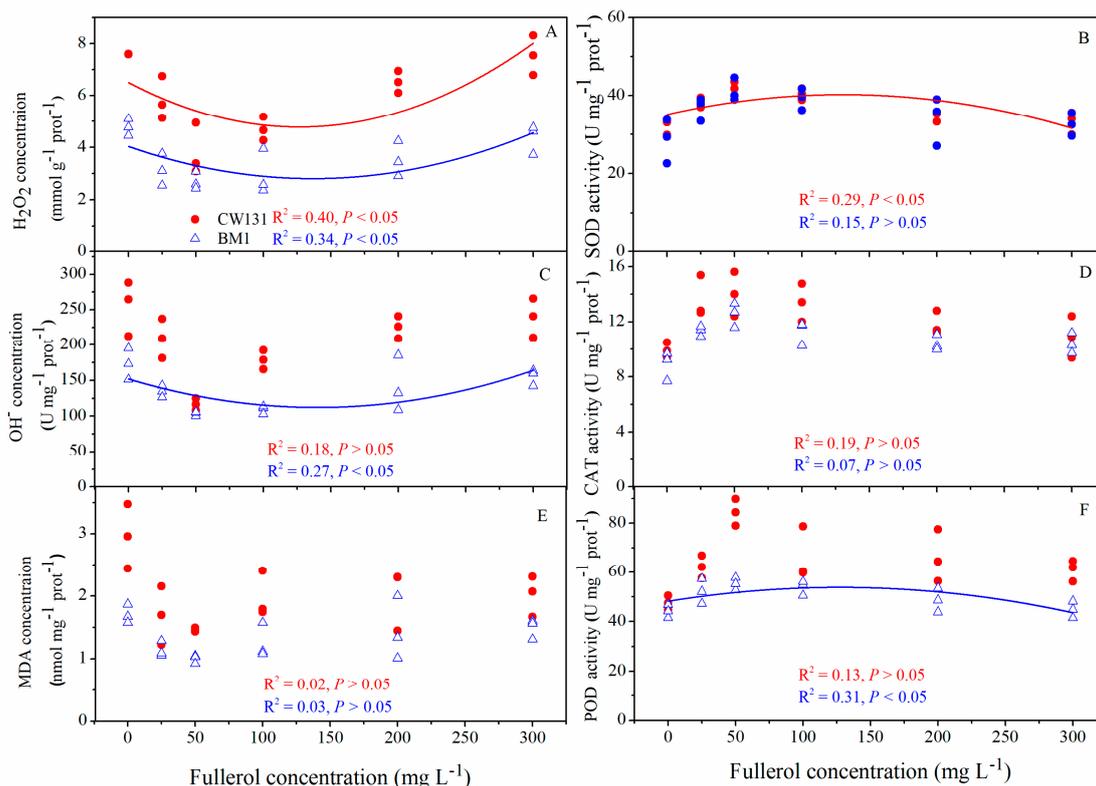


Figure S2. Contents of hydrogen peroxide (H_2O_2) (A), hydroxyl radical ($\cdot\text{OH}$) (C), malondialdehyde (MDA) (E), and Activities of antioxidant enzymes: superoxide dismutase (SOD) (B), catalase (CAT) (D), and pe-oxidase (POD) (F) of two winter cultivars (CW131 and BM1) plotted against six concentrations of fullerol (0, 20, 50, 100, 200, 300 mg L^{-1}).

Table S2. The result comparing the regression curve of the response of hydrogen peroxide (H_2O_2) to fullerol addition. These regressions were done using linear model, quadratic model, and One-way ANOVA model via lack of fit test function of the library of R.

| | Source | <i>df</i> of regression | <i>df</i> of error | <i>F</i> value | <i>P</i> | <i>R</i> ² |
|-------|--|-------------------------|--------------------|----------------|----------|-----------------------|
| CW131 | Linear (x as contious variable) | 1 | 16 | 2.090 | 0.168 | 0.060 |
| | One-way ANOVA (x as discrete variable) | 5 | 12 | 15.980 | < 0.001 | 0.815 |
| | Quadratic (x as contious variable) | 2 | 15 | 6.726 | 0.008 | 0.403 |
| | lack of fit between Linear and Quadratic | -1 | | 10.166 | 0.006 | |
| | lack of fit between One-way ANOVA and Quadratic | 3 | | 12.149 | < 0.001 | |
| BM1 | Linear (x as contious variable) | 1 | 16 | 0.624 | 0.441 | -0.023 |
| | One-way ANOVA (x as discrete variable) | 5 | 12 | 5.825 | 0.006 | 0.587 |
| | Quadratic (x as contious variable) | 2 | 15 | 5.336 | 0.018 | 0.338 |
| | lack of fit between Linear and Quadratic | -1 | | 9.709 | 0.007 | |

| | | | |
|--|---|-------|-------|
| lack of fit between One-way ANOVA and Quadratic | 3 | 4.009 | 0.034 |
|--|---|-------|-------|

Table S3. The results comparing the regression curve of the response of hydroxyl radical ($\cdot\text{OH}$) to fullerol addition. These regressions were done using linear model, quadratic model, and One-way ANOVA model via lack of fit test function of the library of R.

| | Source | <i>df</i> of regression | <i>df</i> of error | <i>F</i> value | <i>P</i> | <i>R</i> ² |
|-------|--|-------------------------|--------------------|----------------|----------|-----------------------|
| CW131 | Linear (x as contious variable) | 1 | 16 | 1.083 | 0.314 | 0.005 |
| | One-way ANOVA (x as discrete variable) | 5 | 12 | 12.720 | < 0.001 | 0.775 |
| | Quadratic (x as contious variable) | 2 | 15 | 2.844 | 0.090 | 0.178 |
| | lack of fit between Linear and Quadratic | -1 | | 4.376 | 0.054 | |
| | lack of fit between One-way ANOVA and Quadratic | 3 | | 14.270 | < 0.001 | |
| BM1 | Linear (x as contious variable) | 1 | 16 | 0.292 | 0.596 | -0.043 |
| | One-way ANOVA (x as discrete variable) | 5 | 12 | 5.651 | 0.007 | 0.578 |
| | Quadratic (x as contious variable) | 2 | 15 | 4.211 | 0.035 | 0.274 |
| | lack of fit between Linear and Quadratic | -1 | | 8.002 | 0.013 | |
| | lack of fit between One-way ANOVA and Quadratic | 3 | | 4.593 | 0.023 | |

Table S4. The results comparing the regression curve of the response of malondialdehyde (MDA) to fullerol addition. These regressions were done using linear model, quadratic model, and One-way ANOVA model via lack of fit test function of the library of R.

| | Source | <i>df</i> of regression | <i>df</i> of error | <i>F</i> value | <i>P</i> | <i>R</i> ² |
|-------|--|-------------------------|--------------------|----------------|----------|-----------------------|
| CW131 | Linear (x as contious variable) | 1 | 16 | 0.225 | 0.642 | -0.048 |
| | One-way ANOVA (x as discrete variable) | 5 | 12 | 4.800 | 0.012 | 0.528 |
| | Quadratic (x as contious variable) | 2 | 15 | 1.214 | 0.325 | 0.025 |
| | lack of fit between Linear and Quadratic | -1 | | 2.186 | 0.160 | |
| | lack of fit between One-way ANOVA and Quadratic | 3 | | 6.328 | 0.008 | |
| BM1 | Linear (x as contious variable) | 1 | 16 | 0.546 | 0.471 | -0.027 |
| | One-way ANOVA (x as discrete variable) | 5 | 12 | 2.974 | 0.057 | 0.367 |
| | Quadratic (x as contious variable) | 2 | 15 | 1.243 | 0.317 | 0.028 |
| | lack of fit between Linear and Quadratic | -1 | | 1.909 | 0.187 | |
| | lack of fit between One-way ANOVA and Quadratic | 3 | | 3.683 | 0.043 | |

Table S5. The results comparing the regression curve of the response of superoxide dismutase (SOD) to fullerol addition. These regressions were done using linear model, quadratic model, and One-way ANOVA model via lack of fit test function of the library of R.

| | Source | <i>df</i> of regression | <i>df</i> of error | <i>F</i> value | <i>P</i> | <i>R</i> ² |
|-------|--|-------------------------|--------------------|----------------|----------|-----------------------|
| CW131 | Linear (x as contious variable) | 1 | 16 | 1.191 | 0.291 | 0.011 |
| | One-way ANOVA (x as discrete variable) | 5 | 12 | 20.050 | < 0.001 | 0.849 |
| | Quadratic (x as contious variable) | 2 | 15 | 4.408 | 0.031 | 0.286 |
| | lack of fit between Linear and Quadratic | -1 | | 7.166 | 0.017 | |
| | lack of fit between One-way ANOVA and Quadratic | 3 | | 19.568 | < 0.001 | |
| BM1 | Linear (x as contious variable) | 1 | 16 | 0.252 | 0.623 | -0.046 |
| | One-way ANOVA (x as discrete variable) | 5 | 12 | 3.707 | 0.029 | 0.443 |
| | Quadratic (x as contious variable) | 2 | 15 | 2.521 | 0.114 | 0.152 |
| | lack of fit between Linear and Quadratic | -1 | | 4.732 | 0.046 | |
| | lack of fit between One-way ANOVA and Quadratic | 3 | | 3.618 | 0.046 | |

Table S6. The results comparing the regression curve of the response of catalase (CAT) to fullerol addition. These regressions were done using linear model, quadratic model, and One-way ANOVA model via lack of fit test function of the library of R.

| | Source | <i>df</i> of regression | <i>df</i> of error | <i>F</i> value | <i>P</i> | <i>R</i> ² |
|-------|--|-------------------------|--------------------|----------------|----------|-----------------------|
| CW131 | Linear (x as contious variable) | 1 | 16 | 0.953 | 0.344 | -0.003 |
| | One-way ANOVA (x as discrete variable) | 5 | 12 | 4.887 | 0.011 | 0.533 |
| | Quadratic (x as contious variable) | 2 | 15 | 3.053 | 0.077 | 0.195 |
| | lack of fit between Linear and Quadratic | -1 | | 4.920 | 0.042 | |
| | lack of fit between One-way ANOVA and Quadratic | 3 | | 4.631 | 0.023 | |
| BM1 | Linear (x as contious variable) | 1 | 16 | 0.063 | 0.805 | -0.058 |
| | One-way ANOVA (x as discrete variable) | 5 | 12 | 7.502 | 0.002 | 0.657 |
| | Quadratic (x as contious variable) | 2 | 15 | 1.627 | 0.229 | 0.069 |
| | lack of fit between Linear and Quadratic | -1 | | 3.182 | 0.095 | |
| | lack of fit between One-way ANOVA and Quadratic | 3 | | 9.562 | 0.002 | |

Table S7. The results comparing the regression curve of the response of peroxidase (POD) to fullerol addition. These regressions were done using linear model, quadratic model, and One-way ANOVA model via lack of fit test function of the library of R.

| | Source | <i>df</i> of regression | <i>df</i> of error | <i>F</i> value | <i>P</i> | <i>R</i> ² |
|-------|--|-------------------------|--------------------|----------------|----------|-----------------------|
| CW131 | Linear (x as continuous variable) | 1 | 16 | 0.025 | 0.876 | -0.061 |
| | One-way ANOVA (x as discrete variable) | 5 | 12 | 8.299 | 0.001 | 0.682 |
| | Quadratic (x as continuous variable) | 2 | 15 | 2.287 | 0.136 | 0.132 |
| | lack of fit between Linear and Quadratic | -1 | | 4.544 | 0.050 | |
| | lack of fit between One-way ANOVA and Quadratic | 3 | | 9.665 | 0.002 | |
| | Linear (x as continuous variable) | 1 | 16 | 1.591 | 0.225 | 0.034 |
| BM1 | One-way ANOVA (x as discrete variable) | 5 | 12 | 4.782 | 0.012 | 0.527 |
| | Quadratic (x as continuous variable) | 2 | 15 | 4.778 | 0.025 | 0.308 |
| | lack of fit between Linear and Quadratic | -1 | | 7.335 | 0.016 | |
| | lack of fit between One-way ANOVA and Quadratic | 3 | | 3.312 | 0.057 | |
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