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**Figure S1** Standard curves of epicatechin (EC), (±)catechin, epigallocatechingallate (EGCG), epicatechingallate (ECG), epigallocatechin (EGC), taxifolin (TF) , and protocatechuic acid (PCA) respectively

.

**Figure S2** Different concentrations dendograms of epicatechin (EC), (±)catechin, epigallocatechingallate (EGCG), epicatechingallate (ECG), epigallocatechin (EGC), taxifolin (TF) , and protocatechuic acid (PCA) respectively.



**Figure S3** Leaf letters biomass in 2 year (2-Y), 15 year (15-Y) and 30 years (30-Y) tea gardens respectively

**Table S1 Yield of different tea garden**

|  |  |
| --- | --- |
|  | **(Hundred-buds Weight)** |
| Treatment | (Fresh weight) | (Dry weight) |
|  | ----------g-------------- |
| T2Y | 118.67±2.03 a | 28.87±1.55 a |
| T15Y | 92.13±2.31b | 21.60±1.37 b |
| T30Y | 79.00±2.08 c | 15.95±1.34 c |

Note: 2-Y, 15-Y and 30-Y represent the newly planted 2-years’ tea field, 15 years and 30 years’ monoculture tea field respectively. Letter a and b in columns show significant difference determined by Tukey’s test (p≤ 0.05, n=100).

**Table S2 Enzyme activities of tea rhizosphere soil under different fertilizers**

|  |  |  |
| --- | --- | --- |
| **Treatment** | **Phenol oxidase** | **Peroxidase** |
|  | **--------mg·g-12h-1--------** |
| CK | 122.42±4.28 c | 22.03±0.52 c |
| 2-Y | 139.30±0.52 b | 24.58±0.1 b |
| 15-Y | 140.68±10.83b | 24.26±0.36 b |
| 30-Y | 185.49±4.56 a | 25.97±0.22 a |

Note: CK, 2-Y, 15-Y and 30-Y represent the bulk soil, newly planted 2-years’ tea field, 15 years and 30 years’ monoculture tea field respectively. Letters a, b and c in columns show significant difference determined by Tukey’s test (p≤ 0.05, n=3).