**Table S2.** The raw data of effective ingredients and physicochemical properties of samples

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Variable** | **Gi1** | **Gi2** | **Gi3** | **Gg1** | **Gg2** | **Gg3** | **Gu1** | **Gu2** | **Gu3** |
| Root effective ingredients | LI (%) | 0.618  | 1.188  | 1.089  | 0.643  | 1.086  | 1.093  | 1.446  | 1.849  | 2.068  |
| GlA (%) | 1.999  | 1.996  | 2.098  | 2.641  | 2.920  | 2.692  | 1.792  | 2.346  | 2.081  |
| GTF (%) | 4.554  | 4.604  | 4.408  | 4.549  | 4.639  | 4.559  | 4.568  | 4.575  | 4.647  |
| Soil physicochemical properties | SOM (g/kg) | 27.846  | 28.384  | 27.740  | 11.711  | 11.873  | 7.903  | 15.888  | 13.997  | 14.349  |
| STN (g/kg) | 0.939  | 0.748  | 0.600  | 0.881  | 0.694  | 0.504  | 0.707  | 0.907  | 0.882  |
| STP (g/kg) | 0.563  | 0.545  | 0.503  | 0.679  | 0.680  | 0.638  | 0.717  | 0.708  | 0.711  |
| STK (g/kg) | 21.553  | 21.304  | 22.735  | 20.878  | 20.647  | 20.787  | 19.695  | 19.539  | 19.995  |
| SNN (mg/kg) | 20.558  | 14.059  | 7.983  | 4.666  | 3.217  | 2.773  | 7.899  | 8.027  | 6.851  |
| SAN (mg/kg) | 5.315  | 5.301  | 3.991  | 3.263  | 3.152  | 3.562  | 6.168  | 5.631  | 6.263  |
| SAP (mg/kg) | 11.562  | 10.732  | 6.736  | 7.623  | 5.378  | 2.874  | 3.741  | 4.136  | 3.221  |
| SAK (mg/kg) | 207.016  | 161.299  | 171.779  | 276.738  | 256.856  | 285.684  | 88.775  | 79.063  | 75.784  |
| TS (g/kg) | 8.492  | 6.117  | 2.483  | 4.008  | 4.267  | 6.408  | 1.125  | 0.975  | 1.000  |
| PH | 8.477  | 8.343  | 8.530  | 8.807  | 8.893  | 8.793  | 8.480  | 8.570  | 8.553  |
| SWC (%) | 4.480  | 4.937  | 5.353  | 6.950  | 7.647  | 9.353  | 2.910  | 3.537  | 4.303  |

Description: Raw data of the effective ingredients and physicochemical properties of samples, Gi, Gg and Gu: *Glycyrrhiza inflata*, *Glycyrrhiza glabra* and *Glycyrrhiza uralensis*; 1, 2 and 3: root depth 0-20cm, 20-40cm, and 40-60cm. Abbreviations: GlA, glycyrrhizic acid; GTF, total flavonoid; LI, liquiritin; SOM, soil organic matter; STN, soil total nitrogen; STP, soil total phosphorus; STK, soil total potassium; SNN, soil nitrate nitrogen; SAN, soil ammonium nitrogen; SAP, soil available phosphorus; SAK, soil available potassium; TS, total salt; PH, soil pH; SWC, soil water content.