**Dephenolization pyrolysis fluid improved physicochemical properties and microbial community structure of saline-alkali soils**

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Table S1 Basic physicochemical properties of pyrolysis fluids at different temperatures

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Temperature（℃） | 300 | 400 | 500 | 600 | 700 |
| pH  Density（g/cm3）  Yield（%）  Water content（%）  Calorific value（k J/g） | 3.15  1.070  35.12±1.69  55.95±0.26  10.12 | 3.38  1.062  38.82±0.51  58.59±0.61  9.22 | 3.56  1.051  41.29±0.92  63.91±0.34  8.39 | 3.68  1.058  36.28±1.13  59.12±0.15  8.98 | 3.70  1.069  34.79±0.37  57.96±0.55  9.75 |

Table S2 Analysis results of pyrolytic liquids at different pyrolysis temperatures by GC‒MS

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Organic compounds | Relative content (%) | | | | | | | | | | |
| 300℃ |  | | 400℃ | | |  | 500℃ | 600℃ | 700℃ | |
| Acetic acid | 26.87 | |  | | 23.85 |  | | 21.93 | 21.12 | | 20.35 | |
| Furfural | 5.90 | |  | | 4.90 |  | | 3.94 | 3.96 | | 3.89 | |
| 1, 2, 3-trimethoxybenzene | ‒ | |  | | 2.15 |  | | 2.14 | 2.21 | | ‒ | |
| Total phenols | 17.01 | |  | | 18.19 |  | | 20.57 | 21.23 | | 22.48 | |
| O-methoxy-phenol | 6.41 | |  | | 6.17 |  | | 5.96 | 5.72 | | 5.56 | |
| 2,6-methoxy-Phenol | 3.69 | |  | | 3.97 |  | | 4.20 | 4.64 | | 4.62 | |
| 3-methyl catechol | 2.49 | |  | | ‒ |  | | 3.48 | 0.24 | | 0.61 | |
| 4-propoxyphenol | 2.39 | |  | | 2.22 |  | | 2.14 | 2.18 | | 2.18 | |
| 4-ethyl-2-methoxy phenol | 2.05 | |  | | 3.52 |  | | 0.56 | 3.47 | | 3.34 | |
| Catechol | ‒ | |  | | 2.62 |  | | 4.11 | 3.98 | | 2.91 | |
| Total alcohol | 11.95 | |  | | 10.61 |  | | 8.82 | 10.03 | | 11.16 | |
| 2-furanmethanol | 11.86 | |  | | 8.43 |  | | 8.80 | 7.65 | | 8.75 | |
| Wood tar alcohol | ‒ | |  | | 2.14 |  | | ‒ | 2.31 | | 2.32 | |
| Total ketone | 7.2 | |  | | 6.6 |  | | 9.5 | 13.2 | | 9.3 | |
| 3-methyl cyclopentane -1,2-dione | 3.54 | |  | | 3.97 |  | | 3.92 | 4.49 | | 4.42 | |
| 3-ethyl-2-hydroxyl-2-cyclopentene-1-ketone | ‒ | |  | | 2.61 |  | | 2.68 | 2.36 | | 2.37 | |
| 3-methyl-2-cyclopentene-1-ketone | ‒ | |  | | ‒ |  | | ‒ | 2.76 | | ‒ | |
| 1-hydroxyl-2-butanone | 3.66 | |  | | ‒ |  | | 2.86 | 3.55 | | 2.55 | |



Figure S1 Trends in the relative content of organic compounds measured by GC-MS

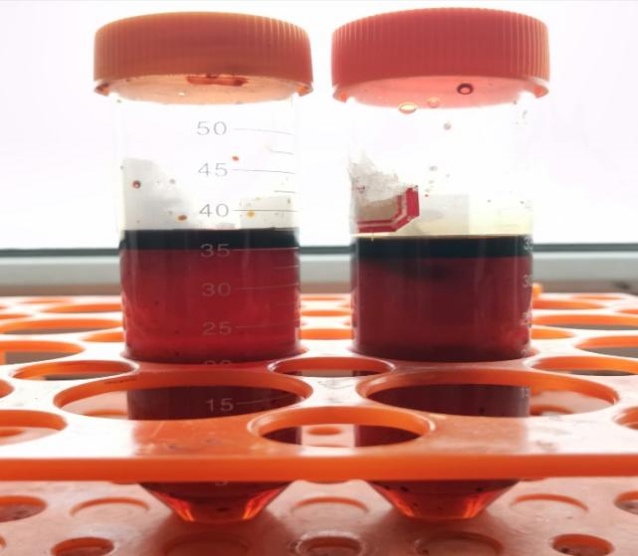


Figure S2 BPF of cotton straw after salting‒out extraction



Figure S3 Mechanism diagram of PF by salting-out extraction

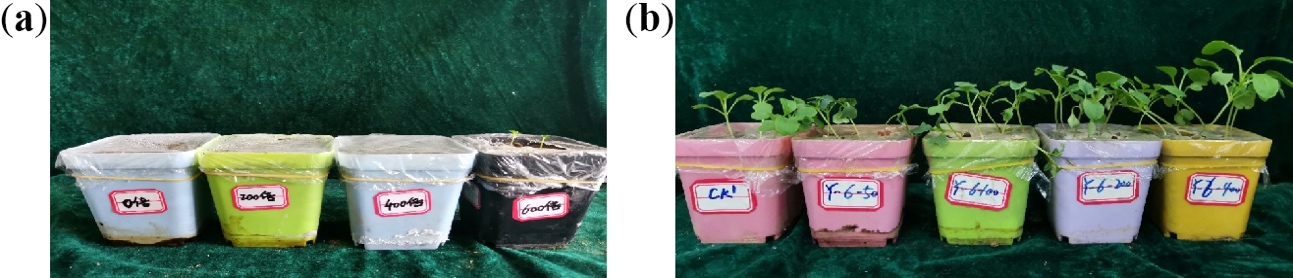


Figure S4 (a) Effects of BPF on seed germination (diluted 0, 200, 400, 600 times from left to right); (b) Effects of LP on growth of pakchoi (CK, dilution 50, 100, 200 and 400 times, respectively, from left to right).