Supporting Information

Phytochemicals of *Conocarpus* spp. as a natural and safe source of phenolic compounds and antioxidants

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Abbreviations

| Abbreviation | Description                  |
|--------------|------------------------------|
| RSM          | Response Surface Methodology |
| CCD          | Central Composite Design     |
| CL           | *Conocarpus lancifolius*     |
| CE           | *Conocarpus erectus*         |
| CLL          | *Conocarpus lancifolius*     |
| CLF          | *Conocarpus lancifolius*     |
| CLR          | *Conocarpus lancifolius*     |
| CEL          | *Conocarpus erectus*         |
| CEF          | *Conocarpus erectus*         |
| CER          | *Conocarpus erectus*         |
Table S1. Central composite design arrangement and responses variable of vanillic acid (ppm) at $P \leq 0.05$.

| Standard Order | Coded variables | erectus | lancifolius |
|----------------|----------------|---------|-------------|
|                | Solvent conc.% | Leaves  | Roots       | Fruits      | Leaves  | Roots       | Fruits      |
| 1              | 0(100)         | 2.54 ± 0.05 | 22.87 ± 3.89 | 0.00 ± 0.00 | 0.00 ± 0.00 | 15.62 ± 1.23 | 1.89 ± 0.11 |
| 2              | −1 (50)        | 0.00 ± 0.00 | 10.11 ± 0.20 | 8.64 ± 0.17 | 0.00 ± 0.00 | 20.53 ± 0.72 | 2.36 ± 0.07 |
| 3              | 0 (75)         | 5.00 ± 0.36 | 16.40 ± 0.93 | 7.06 ± 0.53 | 0.01 ± 0.02 | 19.97 ± 0.16 | 0.00 ± 0.00 |
| 4              | 0 (75)         | 2.72 ± 0.11 | 4.45 ± 0.17  | 5.15 ± 0.26 | 0.00 ± 0.00 | 8.04 ± 0.16  | 1.23 ± 1.10 |
| 5              | −1 (100)       | 8.63 ± 0.20 | 1.786 ± 0.17 | 2.24 ± 0.05 | 0.00 ± 0.00 | 12.7 ± 0.02  | 0.00 ± 0.00 |
| 6              | 0 (100)        | 3.73 ± 0.04 | 15.40 ± 0.98 | 4.15 ± 0.19 | 0.00 ± 0.00 | 26.40 ± 1.14 | 0.00 ± 0.00 |
| 7              | −1 (50)        | 3.84 ± 0.21 | 12.35 ± 0.87 | 10.78 ± 0.80 | 0.00 ± 0.00 | 14.97 ± 0.35 | 1.46 ± 0.12 |
| 8              | 0 (75)         | 6.22 ± 4.68 | 18.36 ± 1.00 | 6.65 ± 0.99 | 0.00 ± 0.00 | 15.73 ± 0.63 | 0.00 ± 0.00 |
| 9              | 0 (75)         | 0.00 ± 0.00 | 21.60 ± 1.65 | 4.27 ± 0.25 | 0.00 ± 0.00 | 11.99 ± 2.70 | 0.00 ± 0.00 |
| 10             | 1 (100)        | 0.00 ± 0.00 | 39.37 ± 0.76 | 12.69 ± 0.27 | 4.18 ± 0.32 | 20.26 ± 1.04 | 0.00 ± 0.00 |
| 11             | 0 (75)         | 5.05 ± 0.06 | 29.21 ± 0.71 | 3.50 ± 0.25 | 3.04 ± 0.27 | 15.12 ± 0.39 | 0.00 ± 0.00 |
| 12             | 0 (75)         | 4.00 ± 0.11 | 16.06 ± 0.30 | 9.74 ± 0.24 | 0.00 ± 0.00 | 15.41 ± 0.57 | 0.00 ± 0.00 |
| 13             | 0 (75)         | 3.73 ± 0.40 | 0.00 ± 0.00  | 2.02 ± 0.03 | 2.09 ± 0.09 | 36.57 ± 1.31 | 0.00 ± 0.00 |
| 14             | −1 (50)        | 0.00 ± 0.00 | 8.96 ± 0.25  | 7.57 ± 0.39 | 0.00 ± 0.00 | 0.00 ± 0.00  | 0.00 ± 0.00 |
| 15             | −1 (50)        | 3.94 ± 0.19 | 124.79 ± 3.80 | 23.17 ± 0.21 | 7.22 ± 0.47 | 44.48 ± 2.04 | 0.00 ± 0.00 |

Values are expressed as mean ± standard deviation ($n = 3$).
Table S2. Central composite design arrangement and responses variable of \( p \)-coumaric acid (ppm) at \( P \leq 0.05 \).

| Standard Order | Coded variables | \( \textit{erectus} \) | | \( \textit{lancifolius} \) | |
|---|---|---|---|---|---|
| | | Leaves | Roots | Fruits | Leaves | Roots | Fruits |
| 1 | 1 (100) | 1 (65) | 0(2) | 0.02 ± 0.02 | 3.58 ± 1.24 | 37.49 ± 4.31 | 5.36 ± 0.41 | 2.82 ± 0.12 | 38.41 ± 1.69 |
| 2 | −1 (50) | 0 (55) | 1(3) | 4.96 ± 0.06 | 0.78 ± 0.04 | 0.00 ± 0.00 | 74.48 ± 2.87 | 2.59 ± 0.02 | 0.00 ± 0.00 |
| 3 | 0 (75) | 0 (55) | 0(2) | 14.74 ± 0.07 | 0.00 ± 0.00 | 0.00 ± 0.00 | 16.68 ± 1.91 | 4.16 ± 0.14 | 15.65 ± 0.33 |
| 4 | 0 (75) | 1 (65) | 1(3) | 6.80 ± 2.24 | 0.00 ± 0.00 | 0.00 ± 0.00 | 45.48 ± 11.79 | 14.97 ± 0.91 | 27.00 ± 6.30 |
| 5 | 1(100) | 0 (55) | −1(1) | 115.46 ± 2.36 | 1.76 ± 0.06 | 9.98 ± 0.87 | 20.37 ± 1.56 | 3.00 ± 0.10 | 21.57 ± 1.75 |
| 6 | 1(100) | −1 (45) | 0(2) | 3.40 ± 0.01 | 1.13 ± 0.03 | 1.11 ± 0.13 | 44.22 ± 6.74 | 3.34 ± 0.12 | 1.03 ± 0.04 |
| 7 | −1(50) | 1 (65) | 0(2) | 19.90 ± 5.13 | 0.00 ± 0.00 | 0.00 ± 0.00 | 18.81 ± 2.23 | 3.79 ± 0.13 | 18.72 ± 0.50 |
| 8 | 0 (75) | 0 (55) | 0(2) | 10.17 ± 0.09 | 8.97 ± 0.07 | 0.63 ± 0.05 | 1.06 ± 0.05 | 1.20 ± 0.82 | 0.00 ± 0.00 |
| 9 | 0 (75) | 1 (65) | −1(1) | 134.14 ± 1.99 | 13.61 ± 0.54 | 42.47 ± 2.32 | 0.21 ± 0.02 | 19.79 ± 0.64 | 7.76 ± 0.25 |
| 10 | 1(100) | 0 (55) | 1(3) | 12.22 ± 0.74 | 4.57 ± 0.05 | 1.37 ± 0.14 | 2.01 ± 1.81 | 1.47 ± 0.04 | 2.56 ± 0.05 |
| 11 | 0 (75) | −1 (45) | 1(3) | 18.46 ± 0.56 | 0.00 ± 0.00 | 0.00 ± 0.00 | 15.05 ± 0.21 | 3.08 ± 0.09 | 15.47 ± 1.13 |
| 12 | 0 (75) | 0 (55) | 0(2) | 1.63 ± 0.05 | 2.25 ± 0.06 | 0.63 ± 0.03 | 3.42 ± 1.26 | 4.93 ± 0.21 | 10.34 ± 0.79 |
| 13 | −1(50) | 0 (55) | −1(1) | 1.96 ± 0.36 | 0.47 ± 0.03 | 1.90 ± 0.28 | 0.00 ± 0.00 | 0.00 ± 0.00 | 1.01 ± 0.02 |
| 14 | 0 (75) | −1 (45) | −1(1) | 1.95 ± 0.41 | 235.06 ± 5.00 | 0.00 ± 0.00 | 2.59 ± 0.40 | 46.38 ± 1.40 | 0.00 ± 0.00 |

Values are expressed as mean ± standard deviation (\( n = 3 \)).
Table S3. Central composite design arrangement and responses variable of \( t \)-ferulic acid (ppm) at \( P \leq 0.05 \).

| Standard Order | Coded variables | Coded variables | vegetus | Roots | Fruits | Coded variables | Coded variables | Coded variables | lancifolius |
|----------------|----------------|----------------|---------|-------|--------|----------------|----------------|----------------|-------------|
| 1              | 1 (100)        | 1 (65)         | 0(2)    | 2.67 ± 0.04 | 4.14 ± 1.42 | 0.16 ± 0.15 | 0.00 ± 0.00 | 2.55 ± 0.09 | 0.00 ± 0.00 |
| 2              | −1 (50)        | 0 (55)         | 1(3)    | 51.80 ± 1.53 | 0.41 ± 0.01 | 1.79 ± 0.37 | 0.00 ± 0.00 | 3.72 ± 0.18 | 0.00 ± 0.00 |
| 3              | 0 (75)         | 0 (55)         | 0(2)    | 27.03 ± 0.25 | 1.22 ± 0.02 | 1.03 ± 0.06 | 0.00 ± 0.00 | 1.40 ± 0.03 | 0.00 ± 0.00 |
| 4              | 0 (75)         | 1 (65)         | 1(3)    | 19.19 ± 0.17 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.14 ± 0.13 |
| 5              | 1(100)         | 0 (55)         | −1(1)   | 31.86 ± 1.07 | 1.11 ± 0.02 | 0.00 ± 0.00 | 3.96 ± 0.10 | 0.00 ± 0.00 | 0.00 ± 0.00 |
| 6              | 1(100)         | −1 (45)        | 0(2)    | 107.45 ± 1.97 | 0.96 ± 0.14 | 4.21 ± 0.56 | 122.75 ± 5.73 | 6.36 ± 0.06 | 0.00 ± 0.00 |
| 7              | −1(50)         | 1 (65)         | 0(2)    | 31.40 ± 0.37 | 1.20 ± 0.02 | 1.02 ± 0.03 | 0.00 ± 0.00 | 0.80 ± 0.03 | 1.56 ± 0.08 |
| 8              | 0 (75)         | 0 (55)         | 0(2)    | 23.44 ± 10.50 | 1.37 ± 0.41 | 1.38 ± 0.30 | 0.00 ± 0.00 | 2.02 ± 0.02 | 0.00 ± 0.00 |
| 9              | 0 (75)         | 1 (65)         | −1(1)   | 54.44 ± 0.82 | 1.71 ± 0.06 | 1.20 ± 0.06 | 1.09 ± 0.11 | 0.46 ± 0.04 | 0.00 ± 0.00 |
| 10             | 1(100)         | 0 (55)         | 1(3)    | 45.33 ± 1.81 | 1.83 ± 0.08 | 2.28 ± 0.16 | 175.20 ± 1.72 | 8.59 ± 0.35 | 0.00 ± 0.00 |
| 11             | 0 (75)         | −1 (45)        | 1(3)    | 37.25 ± 3.03 | 3.03 ± 0.06 | 0.00 ± 0.00 | 0.35 ± 0.31 | 1.08 ± 0.07 | 1.55 ± 0.10 |
| 12             | 0 (75)         | 0 (55)         | 0(2)    | 27.13 ± 0.27 | 1.41 ± 0.05 | 1.00 ± 0.13 | 0.00 ± 0.00 | 1.51 ± 0.17 | 0.00 ± 0.00 |
| 13             | −1(50)         | 0 (55)         | −1(1)   | 0.84 ± 0.04 | 0.61 ± 0.02 | 0.83 ± 0.05 | 32.01 ± 1.07 | 1.50 ± 0.17 | 0.00 ± 0.00 |
| 14             | 0 (75)         | −1 (45)        | −1(1)   | 0.00 ± 0.00 | 0.00 ± 0.00 | 1.55 ± 0.32 | 22.42 ± 2.44 | 0.00 ± 0.00 | 1.63 ± 0.09 |
| 15             | −1(50)         | −1 (45)        | 0(2)    | 1.34 ± 0.08 | 137.07 ± 1.29 | 4.10 ± 0.10 | 37.74 ± 1.07 | 50.16 ± 1.23 | 0.00 ± 0.00 |

Values are expressed as mean ± standard deviation \((n = 3)\).
Table S4. Central composite design arrangement and responses variable of sinapic acid (ppm) at \( P \leq 0.05 \).

| Standard Order | Coded variables | \( \text{erectus} \) | \( \text{lancifolius} \) |
|----------------|----------------|----------------------|----------------------|
|                |                | Leaves               | Roots                | Fruits               | Leaves               | Roots                | Fruits               |
| 1              | 1 (100)        | 0.00 ± 0.00          | 49.98 ± 24.44        | 0.00 ± 0.00          | 29.76 ± 0.39         | 0.00 ± 0.00          | 24.10 ± 1.99         |
| 2              | −1 (50)        | 94.32 ± 0.82         | 24.14 ± 0.17         | 15.38 ± 1.51         | 21.35 ± 1.56         | 11.20 ± 0.74         | 0.00 ± 0.00          |
| 3              | 0 (75)         | 67.27 ± 1.01         | 0.00 ± 0.00          | 31.00 ± 0.46         | 42.46 ± 3.37         | 0.00 ± 0.00          | 0.00 ± 0.00          |
| 4              | 0 (75)         | 49.48 ± 0.32         | 32.33 ± 2.46         | 0.00 ± 0.00          | 68.97 ± 14.60        | 0.00 ± 0.00          | 0.31 ± 0.29          |
| 5              | 1(100)         | 93.02 ± 1.01         | 5.28 ± 0.04          | 0.00 ± 0.00          | 115.79 ± 6.01        | 0.00 ± 0.00          | 0.00 ± 0.00          |
| 6              | 1(100)         | 0.00 ± 0.00          | 31.78 ± 1.94         | 0.00 ± 0.00          | \( \text{254.54 ± 38.75} \) | 29.94 ± 0.29         | 0.00 ± 0.00          |
| 7              | −1(50)         | 63.45 ± 0.45         | 0.00 ± 0.00          | 21.13 ± 1.24         | 49.99 ± 8.31         | 28.95 ± 0.37         | 0.00 ± 0.00          |
| 8              | 0 (75)         | 66.78 ± 4.33         | 0.00 ± 0.00          | 27.36 ± 0.49         | 45.56 ± 2.91         | 0.00 ± 0.00          | 0.00 ± 0.00          |
| 9              | 0 (75)         | 81.89 ± 1.66         | 0.00 ± 0.00          | 17.29 ± 0.60         | 21.24 ± 2.31         | 4.67 ± 2.11          | 0.00 ± 0.00          |
| 10             | 1(100)         | 189.20 ± 3.14        | 0.00 ± 0.00          | 53.31 ± 2.95         | 17.09 ± 0.17         | 0.00 ± 0.00          | 0.00 ± 0.00          |
| 11             | 0 (75)         | 45.56 ± 3.04         | 0.00 ± 0.00          | 0.00 ± 0.00          | 37.01 ± 4.90         | 0.00 ± 0.00          | 76.91 ± 3.01         |
| 12             | 0 (75)         | 63.17 ± 1.27         | 0.00 ± 0.00          | 35.22 ± 1.33         | 41.69 ± 1.19         | 0.00 ± 0.00          | 0.00 ± 0.00          |
| 13             | −1(50)         | 18.25 ± 0.80         | 0.00 ± 0.00          | 7.35 ± 0.67          | 47.20 ± 4.35         | 61.93 ± 1.61         | 0.00 ± 0.00          |
| 14             | 0 (75)         | 17.22 ± 0.66         | 0.00 ± 0.00          | 21.13 ± 1.88         | 40.43 ± 1.55         | 0.00 ± 0.00          | 28.02 ± 2.44         |
| 15             | −1(50)         | 16.41 ± 1.23         | \( \text{237.54 ± 3.58} \) | 58.84 ± 3.67         | 41.89 ± 2.82         | 39.83 ± 0.63         | 0.00 ± 0.00          |

Values are expressed as mean ± standard deviation (\( n = 3 \)).
Table S5. Central composite design arrangement and responses variable of rutin hydrate (ppm) at $P \leq 0.05$.

| Standard Order | Coded variables |            |            |            |            |            |            |            |            |            |
|----------------|----------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
|                |                | Leaves     | Roots      | Fruits     | Leaves     | Roots      | Fruits     | Leaves     | Roots      | Fruits     |
|                |                |            |            |            |            |            |            |            |            |            |
| 1              | 1 (100)        | 133.34 ± 1.35 | 157.21 ± 37.50 | 5.09 ± 2.71 | 554.89 ± 13.69 | 29.34 ± 0.86 | 35.54 ± 1.71 |            |            |            |
| 2              | −1 (50)        | 65.40 ± 0.57  | 5.98 ± 0.23  | 8.18 ± 0.19 | 18.10 ± 2.01 | 13.77 ± 0.82 | 139.12 ± 3.24 |            |            |            |
| 3              | 0 (75)         | 127.48 ± 0.47 | 226.07 ± 5.68 | 10.00 ± 0.00 | 185.98 ± 5.86 | 10.18 ± 0.24 | 267.93 ± 2.45 |            |            |            |
| 4              | 0 (75)         | 38.11 ± 0.11  | 11.09 ± 0.89 | 13.88 ± 0.23 | 228.90 ± 27.26 | 217.82 ± 2.56 | 31.50 ± 4.44 |            |            |            |
| 5              | 1 (100)        | 413.41 ± 2.20 | 25.30 ± 1.18 | 10.68 ± 0.76 | 272.14 ± 13.80 | 59.14 ± 1.18 | 84.37 ± 3.80 |            |            |            |
| 6              | −1 (45)        | 167.43 ± 3.09 | 47.74 ± 1.23 | 8.69 ± 0.43  | 475.12 ± 83.75 | 80.58 ± 1.29 | 68.22 ± 1.12 |            |            |            |
| 7              | −1 (50)        | 62.54 ± 0.47  | 6.84 ± 0.06  | 9.87 ± 0.41  | 78.38 ± 10.23 | 115.17 ± 1.82 | 104.22 ± 1.29 |            |            |            |
| 8              | 0 (75)         | 111.47 ± 5.60 | 220.66 ± 2.35 | 9.14 ± 0.28  | 192.30 ± 4.50 | 10.32 ± 0.57 | 275.69 ± 5.82 |            |            |            |
| 9              | 0 (75)         | 250.27 ± 2.23 | 399.30 ± 2.36 | 14.31 ± 0.74 | 29.08 ± 1.55 | 3.76 ± 1.02  | 222.64 ± 7.23 |            |            |            |
| 10             | 1 (100)        | 1362.55 ± 8.12 | 29.67 ± 0.85  | 27.37 ± 3.46 | 102.40 ± 2.81 | 19.53 ± 0.72  | 458.59 ± 3.44 |            |            |            |
| 11             | 0 (75)         | 223.19 ± 4.37 | 136.47 ± 2.68 | 5.67 ± 0.38  | 94.01 ± 3.96 | 15.09 ± 0.08 | 30.17 ± 0.99 |            |            |            |
| 12             | 0 (75)         | 131.34 ± 4.39 | 249.80 ± 1.01 | 11.44 ± 1.27 | 179.70 ± 1.64 | 9.15 ± 4.77  | 258.21 ± 5.54 |            |            |            |
| 13             | −1 (50)        | 23.90 ± 1.67  | 0.00 ± 0.00  | 7.37 ± 0.28  | 91.43 ± 2.36 | 85.26 ± 3.63 | 17.19 ± 1.80 |            |            |            |
| 14             | 0 (75)         | 33.99 ± 4.00  | 21.48 ± 0.51  | 19.58 ± 1.46 | 59.86 ± 3.14 | 6.36 ± 0.40  | 140.18 ± 3.74 |            |            |            |
| 15             | −1 (45)        | 30.45 ± 2.15  | 635.60 ± 112.26 | 19.59 ± 0.69 | 99.35 ± 8.41 | 85.61 ± 0.63 | 40.08 ± 1.21 |            |            |            |

Values are expressed as mean ± standard deviation ($n = 3$).
Table S6. Central composite design arrangement and responses variable of protocatechuic acid (ppm) at $P \leq 0.05$.

| Standard Order | Coded variables |  |  |  |  |  |  |  |  |  |  |
|----------------|----------------|---|---|---|---|---|---|---|---|---|---|
|  | Solvent conc.% | Temp °C | Time h | Leaks | Roots | Fruits | Leaks | Roots | Fruits |
| 1 | 1 (100) | 1 (65) | 0(2) | 108.55 ± 0.85 | 39.72 ± 2.88 | 80.71 ± 3.94 | 21.15 ± 2.86 | 12.25 ± 1.11 | 99.23 ± 3.35 |
| 2 | 0 (55) | 0 (55) | 1(3) | 99.48 ± 0.85 | 32.74 ± 1.56 | 95.10 ± 2.66 | 25.18 ± 1.81 | 42.25 ± 1.92 | 99.59 ± 0.72 |
| 3 | 0 (75) | 0 (55) | 0(2) | 13.38 ± 0.26 | 89.67 ± 1.54 | 116.77 ± 3.82 | 23.44 ± 2.49 | 39.67 ± 1.00 | 116.14 ± 2.40 |
| 4 | 0 (75) | 1 (65) | 1(3) | 9.59 ± 0.05 | 7.32 ± 0.48 | 3.47 ± 0.11 | 42.77 ± 2.51 | 2.61 ± 0.24 | 127.39 ± 14.86 |
| 5 | 1(100) | 0 (55) | −1(1) | 107.11 ± 1.13 | 16.28 ± 0.54 | 100.79 ± 1.09 | 36.59 ± 2.57 | 5.11 ± 0.12 | 107.24 ± 3.46 |
| 6 | 1(100) | −1 (45) | 0(2) | 7.85 ± 0.17 | 32.94 ± 2.05 | 105.08 ± 3.66 | 119.11 ± 19.63 | 8.84 ± 0.25 | 99.40 ± 0.97 |
| 7 | −1(50) | 1 (65) | 0(2) | 14.89 ± 0.03 | 35.39 ± 2.02 | 101.41 ± 2.41 | 19.56 ± 2.40 | 10.20 ± 0.26 | 132.16 ± 6.31 |
| 8 | 0 (75) | 0 (55) | 0(2) | 18.91 ± 1.58 | 76.34 ± 0.60 | 125.40 ± 26.67 | 21.54 ± 1.47 | 34.76 ± 0.60 | 110.54 ± 1.63 |
| 9 | 0 (75) | 1 (65) | −1(1) | 23.63 ± 0.25 | 35.74 ± 1.13 | 72.85 ± 49.84 | 21.57 ± 1.00 | 38.71 ± 4.50 | 98.98 ± 8.66 |
| 10 | 1(100) | 0 (55) | −1(1) | 20.40 ± 1.73 | 71.54 ± 1.73 | 105.13 ± 1.80 | 18.67 ± 1.10 | 28.52 ± 0.73 | 109.74 ± 2.39 |
| 11 | 0 (75) | −1 (45) | 1(3) | 12.15 ± 0.13 | 99.51 ± 0.86 | 106.79 ± 6.16 | 13.52 ± 4.02 | 8.35 ± 0.37 | 104.51 ± 2.13 |
| 12 | 0 (75) | 0 (55) | 0(2) | 15.28 ± 0.40 | 79.63 ± 0.81 | 70.47 ± 49.61 | 23.95 ± 1.71 | 37.77 ± 0.51 | 108.79 ± 1.57 |
| 13 | −1(50) | 0 (55) | −1(1) | 17.69 ± 1.12 | 41.27 ± 1.43 | 107.87 ± 2.66 | 15.05 ± 1.18 | 40.77 ± 1.34 | 90.73 ± 1.70 |
| 14 | 0 (75) | −1 (45) | −1(1) | 8.11 ± 0.58 | 7.92 ± 0.07 | 130.79 ± 2.23 | 20.71 ± 1.26 | 42.13 ± 1.78 | 101.50 ± 1.57 |
| 15 | −1(50) | −1 (45) | 0(2) | 12.29 ± 1.02 | 53.02 ± 2.25 | 101.41 ± 1.83 | 14.70 ± 0.98 | 102.21 ± 2.03 | 183.40 ± 4.33 |

Values are expressed as mean ± standard deviation ($n = 3$).
Table S7. Central composite design arrangement and responses variable of quercetin (ppm) at $P \leq 0.05$.

| Standard Order | Coded variables | \( \text{erectus} \) | \( \text{lancifolius} \) |
|----------------|-----------------|-----------------|-----------------|
|                | Solvent conc.% | Leaves         | Roots          | Fruits         | Leaves         | Roots          | Fruits         |
| 1              | 1 (100)        | 5.49 ± 0.34    | 111.71 ± 1.59 | 112.23 ± 2.52 | 5.99 ± 0.30    | 4.59 ± 0.25    | 117.67 ± 3.20 |
| 2              | −1 (50)        | 111.97 ± 0.98  | 111.11 ± 1.86 | 120.77 ± 2.01 | 6.59 ± 0.42    | 110.75 ± 1.42 | 116.15 ± 2.55 |
| 3              | 0 (75)         | 5.20 ± 0.36    | 104.91 ± 1.18 | 116.38 ± 4.67 | 6.77 ± 0.47    | 114.49 ± 1.25 | 104.68 ± 7.85 |
| 4              | 0 (75)         | 5.36 ± 0.06    | 116.35 ± 2.10 | 119.71 ± 0.85 | 5.21 ± 1.82    | 121.41 ± 1.42 | 117.98 ± 3.86 |
| 5              | 1 (100)        | 8.17 ± 0.11    | 112.75 ± 2.80 | 117.26 ± 0.80 | 5.93 ± 0.21    | 4.74 ± 0.35    | 82.23 ± 1.93  |
| 6              | 1 (100)        | 8.59 ± 0.55    | 115.35 ± 0.56 | 122.23 ± 1.28 | 19.87 ± 2.79   | 107.49 ± 2.76  | 110.48 ± 1.56 |
| 7              | −1 (50)        | 6.18 ± 0.16    | 115.17 ± 2.48 | 122.53 ± 5.67 | 5.91 ± 0.80    | 0.00 ± 0.00    | 119.23 ± 2.14 |
| 8              | 0 (75)         | 8.57 ± 2.01    | 100.12 ± 0.83 | 112.95 ± 1.35 | 6.96 ± 0.45    | 117.41 ± 1.35 | 108.54 ± 3.64 |
| 9              | 0 (75)         | 5.62 ± 0.33    | 106.77 ± 1.10 | 110.64 ± 2.04 | 5.81 ± 0.86    | 112.19 ± 9.36 | 120.92 ± 3.86 |
| 10             | 1 (100)        | 5.82 ± 0.76    | 87.73 ± 1.18  | 4.02 ± 0.11   | 109.51 ± 1.84  | 109.68 ± 2.53  | 110.46 ± 2.19 |
| 11             | 0 (75)         | 4.60 ± 0.07    | 102.16 ± 0.99 | 102.72 ± 2.50 | 7.26 ± 2.32    | 108.23 ± 1.73  | 116.23 ± 3.17 |
| 12             | 0 (75)         | 5.45 ± 1.27    | 108.92 ± 1.08 | 115.18 ± 3.76 | 5.40 ± 0.41    | 113.88 ± 1.06  | 110.42 ± 4.61 |
| 13             | −1 (50)        | 5.08 ± 0.30    | 113.58 ± 2.48 | 115.16 ± 1.99 | 3.93 ± 0.12    | 114.03 ± 0.51  | 110.19 ± 2.07 |
| 14             | 0 (75)         | 4.41 ± 0.45    | 101.22 ± 1.19 | 120.88 ± 1.82 | 5.19 ± 0.36    | 5.54 ± 0.31    | 113.56 ± 1.76 |
| 15             | −1 (50)        | 5.04 ± 0.09    | 137.31 ± 3.58 | 115.86 ± 4.69 | 6.65 ± 0.61    | 108.95 ± 2.25  | 117.32 ± 2.58 |

Values are expressed as mean ± standard deviation (\( n = 3 \)).
Table S8. Central composite design arrangement and responses variable of flavone (ppm) at $P \leq 0.05$.

| Standard Order | Coded variables | \( \text{erectus} \) | \( \text{lancifolius} \) |
|---------------|-----------------|------------------|------------------|
|               | Leaves          | Roots            | Fruits           | Leaves          | Roots            | Fruits           |
| 1             | 1 (100)         | 152.27 ± 1.97    | 115.67 ± 10.445  | 115.71 ± 10.30  | 78.94 ± 6.10    | 85.15 ± 1.13     | 101.02 ± 2.45    |
| 2             | -1 (50)         | 338.08 ± 1.82    | 118.42 ± 1.380   | 100.71 ± 2.93   | 0.00 ± 0.00     | 77.28 ± 1.66     | 101.87 ± 1.89    |
| 3             | 0 (75)          | 532.00 ± 0.14    | 152.13 ± 1.305   | 103.86 ± 1.83   | 367.06 ± 2.05   | 99.10 ± 1.57     | 70.63 ± 5.28     |
| 4             | 0 (75)          | 706.39 ± 5.79    | 169.70 ± 1.572   | 100.34 ± 11.23  | 123.81 ± 11.41  | 70.49 ± 0.71     | 98.38 ± 16.87    |
| 5             | 1 (100)         | 2119.46 ± 4.12   | 249.97 ± 7.556   | 125.59 ± 4.62   | 66.70 ± 11.50   | 72.92 ± 3.69     | 107.78 ± 2.03    |
| 6             | 1 (100)         | 502.41 ± 3.08    | 111.30 ± 2.945   | 91.22 ± 2.40    | 0.00 ± 0.00     | 0.00 ± 0.00      | 81.65 ± 1.99     |
| 7             | -1 (50)         | 948.88 ± 2.43    | 138.85 ± 1.232   | 124.26 ± 8.14   | 123.88 ± 6.18   | 0.00 ± 0.00      | 0.00 ± 0.00      |
| 8             | 0 (75)          | 541.31 ± 152.17  | 163.06 ± 3.874   | 92.15 ± 13.02   | 125.26 ± 9.54   | 96.35 ± 1.20     | 82.15 ± 1.82     |
| 9             | 0 (75)          | 177.87 ± 2.41    | 105.58 ± 2.000   | 138.58 ± 2.30   | 122.34 ± 4.51   | 96.32 ± 19.03    | 72.64 ± 1.93     |
| 10            | 1 (100)         | 1813.21 ± 8.14   | 266.13 ± 5.369   | 140.18 ± 2.33   | 413.48 ± 12.36  | 89.64 ± 1.15     | 184.88 ± 7.06    |
| 11            | 0 (75)          | 150.85 ± 2.20    | 89.08 ± 1.602    | 131.17 ± 2.69   | 120.11 ± 20.64  | 75.70 ± 1.43     | 79.80 ± 1.67     |
| 12            | 0 (75)          | 560.11 ± 21.90   | 159.06 ± 0.493   | 96.77 ± 5.01    | 376.11 ± 10.70  | 100.43 ± 1.41    | 79.96 ± 0.58     |
| 13            | -1 (50)         | 124.82 ± 13.69   | 68.66 ± 1.464    | 97.86 ± 2.40    | 569.61 ± 16.22  | 102.41 ± 2.12    | 75.45 ± 2.23     |
| 14            | 0 (75)          | 62.28 ± 4.31     | 77.48 ± 2.665    | 93.20 ± 2.68    | 744.68 ± 30.81  | 90.90 ± 2.70     | 71.13 ± 2.36     |
| 15            | -1 (50)         | 87.11 ± 7.06     | 121.81 ± 2.112   | 93.18 ± 2.87    | 92.12 ± 4.51    | 81.69 ± 1.98     | 103.11 ± 1.02    |

Values are expressed as mean ± standard deviation \((n=3)\).
Table S9. Botanical classification of *Conocarpus* species

| Species (1) | Species (2) |
|-------------|-------------|
| **Kingdom:** Plantae | **Kingdom:** Plantae |
| **Clade:** Angiosperms | **Clade:** Angiosperms |
| **Clade:** Eudicots | **Clade:** Eudicots |
| **Clade:** Eudicots | **Clade:** Rosids |
| **Order:** Myrtales | **Order:** Myrtales |
| **Family:** Combretaceae | **Family:** Combretaceae |
| **Genus:** Conocarpus L. | **Genus:** Conocarpus L. |
| **Species:** *C. lancifolius* | **Species:** *C. erectus* |

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Figure S1. Flow diagram of extraction process of phytochemicals from Conocarpus spp. parts (fruits, leaves and roots).

Table S10. Independent variables and their levels used in the response surface design.

| Independent variables     | Unit     | Symbol | Code Levels (X_i) |
|---------------------------|----------|--------|-------------------|
|                           |          |        | -1    | 0    | 1    |
| Concentration of solvent  | % (v/v)  | X_1    | 50    | 75   | 100  |
| Temperature               | °C       | X_2    | 45    | 55   | 65   |
| Time                      | h        | X_3    | 1     | 2    | 3    |
| Parameter                     | Acceptance Criteria | Results                  |
|-------------------------------|---------------------|--------------------------|
| Specificity                   | ≤ 30% of LOQ        | No Peak Observed         |
| Selectivity & system reliability | RSD < 10%           | RSD < 10%                |
| Linearity                     | R² > 0.9900         | R² > 0.9961–0.9983       |
| Matrix effect                 | < 20%               | < 20%                    |
| LOQ                           | -                   | 0.04–1.16 µg/mL          |
| LOD                           | -                   | 0.01–0.02 µg/mL          |
| Recovery                      | 70–120%             | 70–120%                  |
| % Recovery: 70–120%           | % Recovery: 70–120%  | % Recovery: 70–120%      |
| Repeatability                 | % RSD: < 20%        | % RSD: < 20%             |
| Range                         | -                   | 10–200 µg/mL             |
| Range                         | -                   | 10–200 µg/mL             |
Table S12. LOD and LOQ of polyphenols

| Compounds                        | LOD (μg/mL) | LOQ (μg/mL) |
|----------------------------------|-------------|-------------|
| 2-Hexenal                        | 0.024       | 1.160       |
| α-Pinene                         | 0.023       | 0.99        |
| Camphene                         | 0.022       | 0.085       |
| 4-hydroxy benzoic acid           | 0.011       | 0.071       |
| Vanillic acid                    | 0.019       | 0.042       |
| Caffeic acid                     | 0.010       | 0.062       |
| Salicylic acid                   | 0.016       | 0.035       |
| 1,2-dihydroxy benzene           | 0.012       | 0.063       |
| Catechin                         | 0.013       | 0.042       |
| Benzoic acid                     | 0.011       | 0.060       |
| p-Coumaric acid                  | 0.010       | 0.053       |
| t-Ferulic acid                   | 0.010       | 0.064       |
| Sinapic acid                     | 0.016       | 0.067       |
| Vanillin                         | 0.015       | 0.050       |
| Chlorogenic acid                 | 0.010       | 0.074       |
| Rutin hydrate                    | 0.010       | 0.052       |
| Cinnamic acid                    | 0.010       | 0.140       |
| t-Cinnamic acid                  | 0.010       | 0.110       |
| Protocatechuic acid              | 0.011       | 0.029       |
| Quercetin                        | 0.011       | 0.047       |
| Flavone                          | 0.012       | 0.055       |
Table S13.  
Retention time (RT) of detected polyphenolic compounds studied in ethanolic extract of *Conocarpus* spp at $\lambda=210$ nm.

| No | Compounds                        | RT (min)     |
|----|----------------------------------|--------------|
| 1  | 2-Hexenal                        | 2.98         |
| 2  | $\alpha$-Pinene                  | 3.35         |
| 3  | Camphene                         | 3.79         |
| 4  | 4-hydroxy benzoic acid           | 3.90, 3.95, 4.24 |
| 5  | Vanillic acid                    | 4.59, 4.71   |
| 6  | Caffeic acid                     | 4.82, 4.87, 4.99 |
| 7  | Salicylic acid                   | 5.44, 5.81   |
| 8  | 1,2-dihydroxy benzene            | 6.30, 6.49, 6.57 |
| 9  | Catechin                         | 6.85, 6.96, 7.05 |
| 10 | Benzoic acid                     | 7.16, 7.38, 7.43, 7.47 |
| 11 | $p$-Coumaric acid                | 7.74, 7.76, 7.78 |
| 12 | $t$-Ferulic acid                 | 7.84, 7.98, 8.02, 8.29 |
| 13 | Sinapic acid                     | 8.35, 8.52, 8.53 |
| 14 | Vanillin                         | 8.76         |
| 15 | Cinnamic acid                    | 8.82, 8.90, 8.96 |
| 16 | Chlorogenic acid                 | 8.60, 8.62   |
| 17 | Rutin hydrate                    | 9.22, 9.43, 9.70, 9.72, 10.38 |
| 18 | $t$-Cinnamic acid                | 10.70, 10.96, 11.07, 11.22 |
| 19 | Protocatechuic acid              | 11.51, 11.60, 11.68, 11.70 |
| 20 | Quercetin                        | 11.99, 12.11, 12.17, 12.29 |
| 21 | Flavone                          | 12.82, 13.02, 13.05 |
Figure S2. HPLC chromatogram of phytochemicals from Conocarpus spp.