**FIGURE CAPTIONS**

**Figure 1. Schematic of microwave pyrolysis rig**

**Figure 2. Elemental analysis of native and residue *L. digitata***

**Figure 3. a) Dielectric properties (Loss Tangent) and b) TGA (solid line) / DTG (dotted line) of native and residue *L. digitata* as a function of temperature.**

**Figure 4. a) Incident, b) absorbed and c) reflected power profile during pyrolysis of native and residue *L. digitata* at average set incident power of 180 W**

**Figure 5. a) Mass loss and b) bio- oil yield of native *L. digitata* at differents incident powers**

**Figure 6. a) Native *L. digitata* pellet and pyrolysed *L. digitata* pellets at specific energies b) 0.6 kJ** $g^{-1}$ **c) 0.9 kJ** $g^{-1}$ **d) 2.7 kJ** $g^{-1}$

**Figure 7. a) Mass loss and b) bio- oil yield of native *L. digitata* and residue *L. digitata* at 180 W incident power**

**Figure 8. a) Residue *L. digitata* pellet and pyrolysed residue *L. digitata* pellets at specific energies b) 0.76 kJ** $g^{-1}$ **c) 1.3 kJ** $g^{-1}$ **d) 2.8 kJ** $g^{-1}$

**Figure 9. Energy yields of native *L. digitata* and residue *L. digitata* bio-chars against specific energy**

**Figure 1**

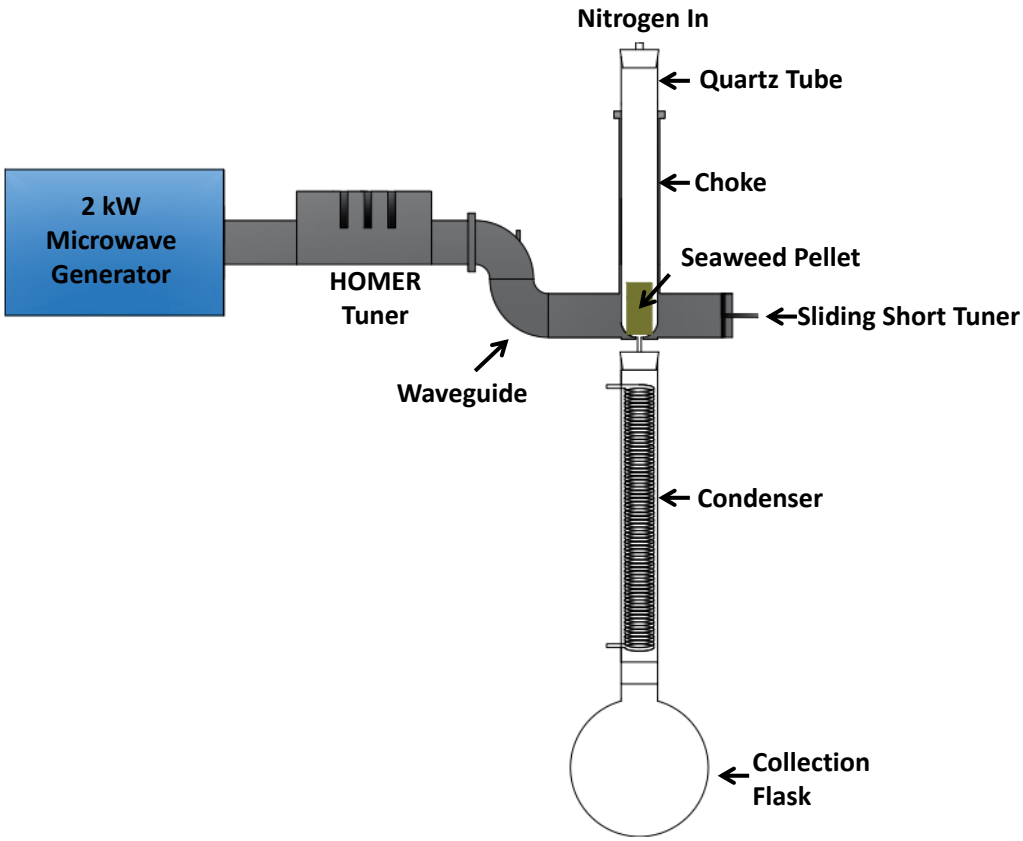

Nitrogen In
Quartz Tube
Choke
2 kW
Microwave
Generator
HOMER
Tuner
Seaweed Pellet
Sliding Short Tuner
Waveguide
Condenser
Collection
Flask

**Figure 2**

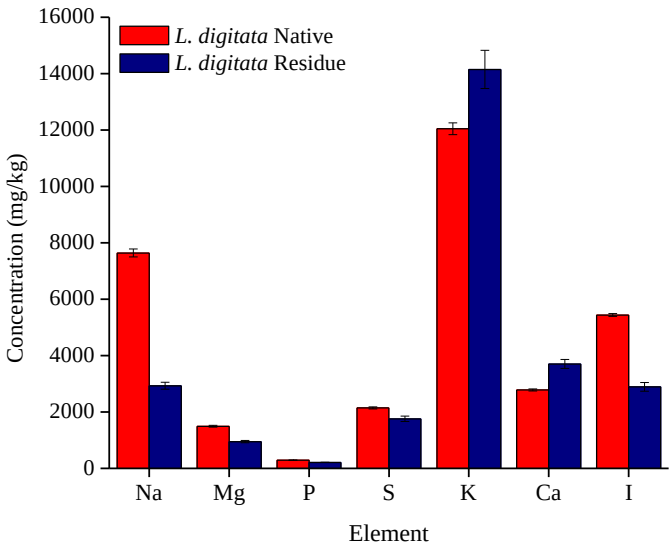

16000
14000
12000
10000
8000
6000
4000
2000
0
Concentration (mg/kg)
L. digitata Native
L. digitata Residue
Na
Mg
P
S
K
Ca
I
Element

**Figure 3**

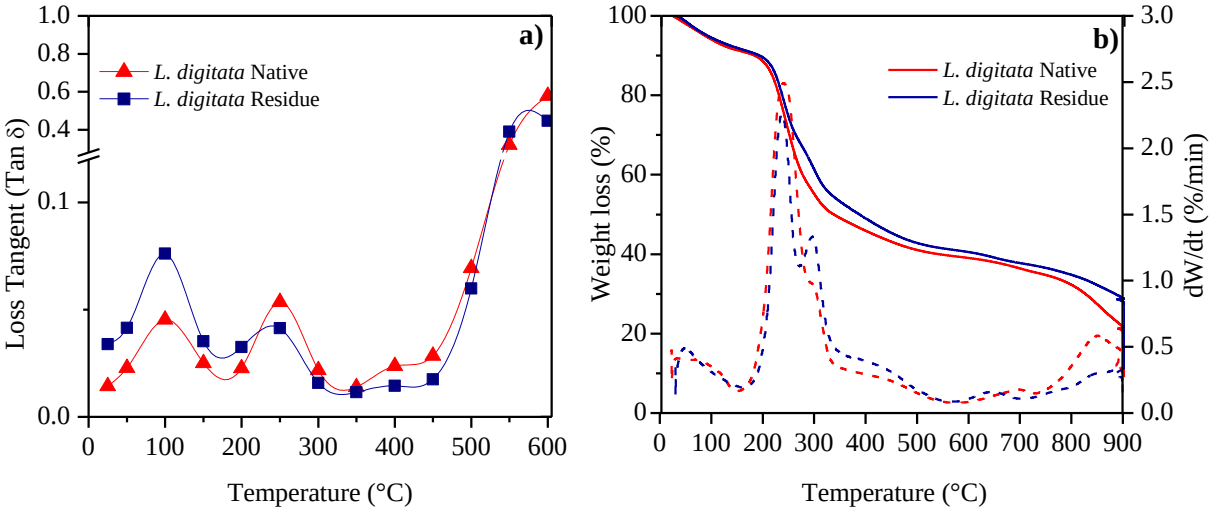

a)
L. digitata Native
L. digitata Residue
Loss Tangent (Tan δ)
Temperature (°C)
b)
L. digitata Native
L. digitata Residue
Weight loss (%)
dW/dt (%/min)
Temperature (°C)

**Figure 4**

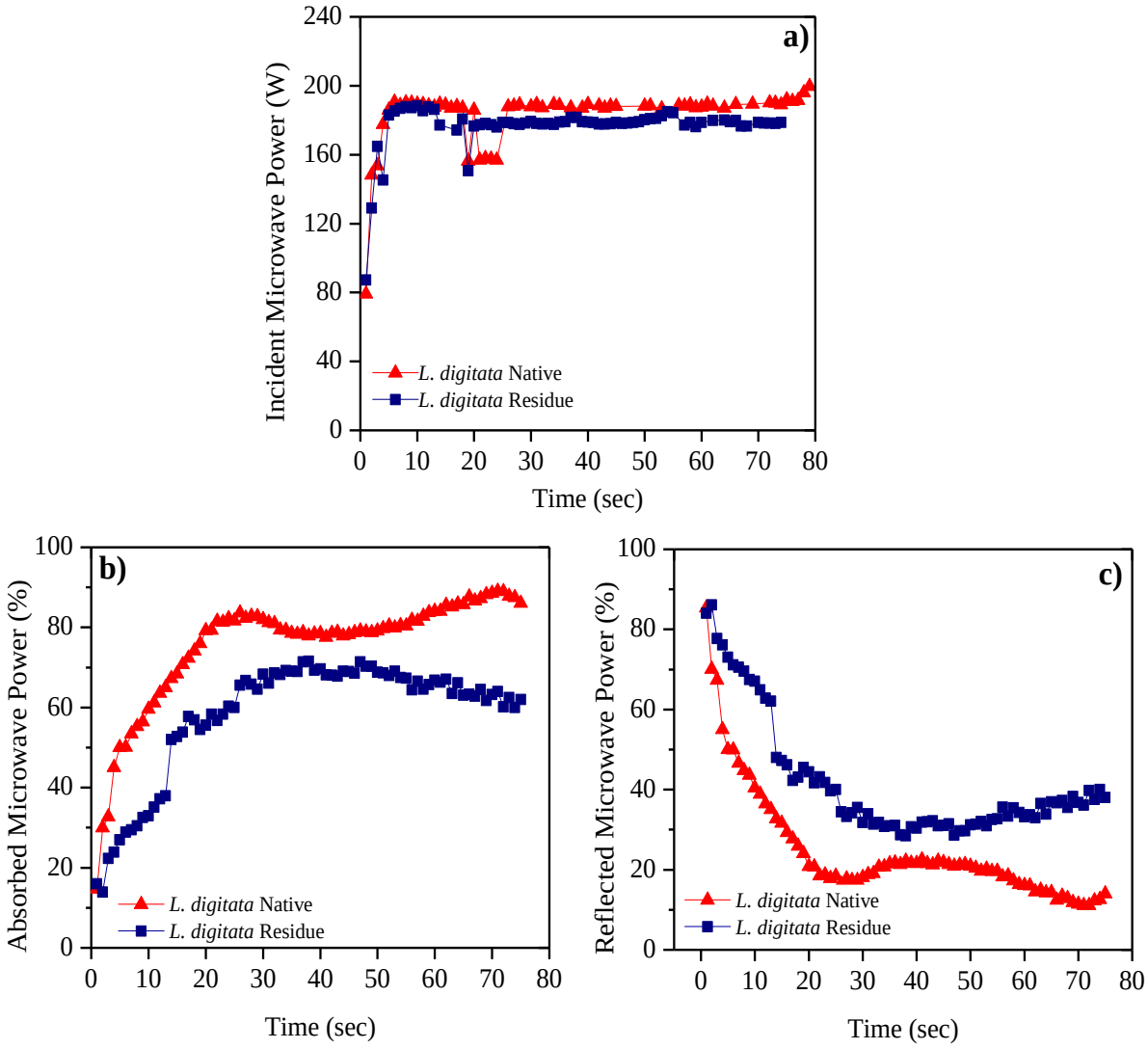

a)
Incident Microwave Power (W)
Time (sec)
L. digitata Native
L. digitata Residue
b)
Absorbed Microwave Power (%)
Time (sec)
L. digitata Native
L. digitata Residue
c)
Reflected Microwave Power (%)
Time (sec)
L. digitata Native
L. digitata Residue

**Figure 5**

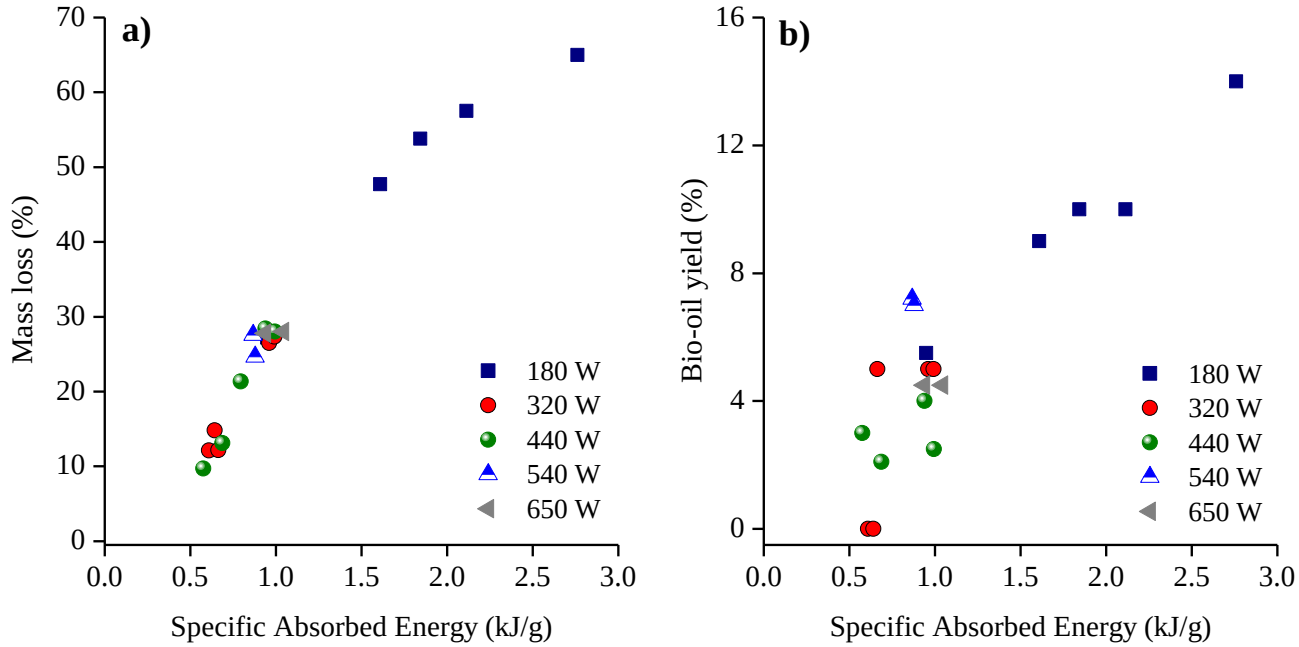

a)
Mass loss (%)
Specific Absorbed Energy (kJ/g)
180 W
320 W
440 W
540 W
650 W
b)
Bio-oil yield (%)
Specific Absorbed Energy (kJ/g)
180 W
320 W
440 W
540 W
650 W

**Figure 6**

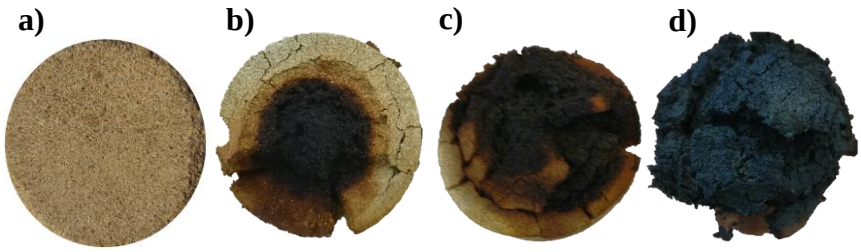


**Figure 7**

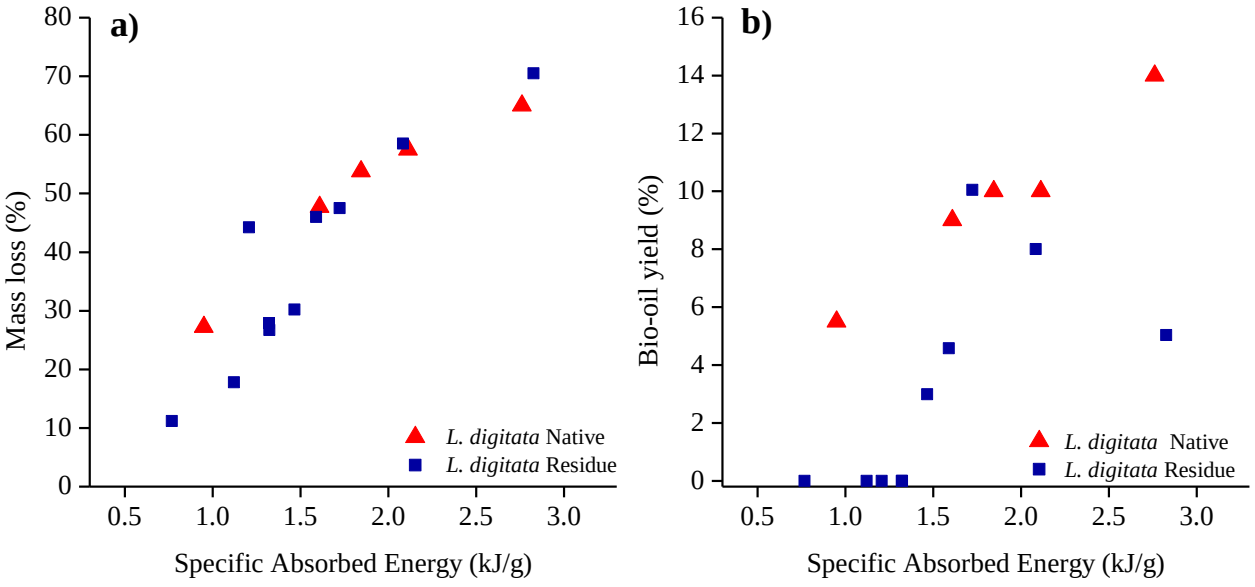

a)
Mass loss (%)
Specific Absorbed Energy (kJ/g)
L. digitata Native
L. digitata Residue
b)
Bio-oil yield (%)
Specific Absorbed Energy (kJ/g)
L. digitata Native
L. digitata Residue

**Figure 8**

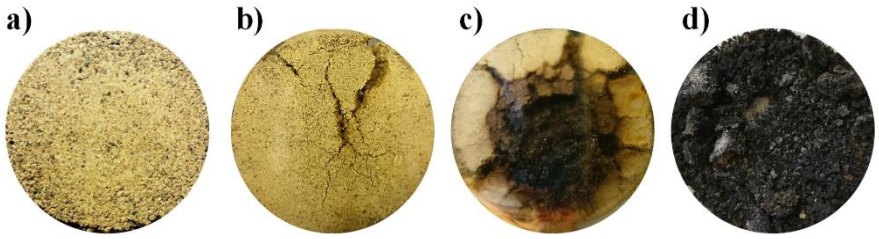
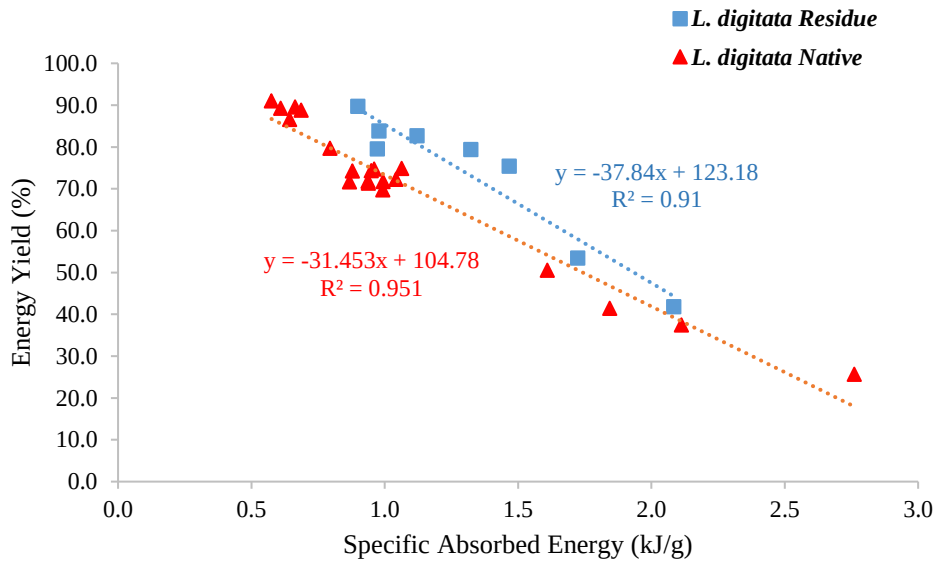


**Figure 9**


L. digitata Residue
L. digitata Native
y = -37.84x + 123.18
R² = 0.91
y = -31.453x + 104.78
R² = 0.951
Energy Yield (%)
Specific Absorbed Energy (kJ/g)
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
0.0
0.5
1.0
1.5
2.0
2.5
3.0