IUFRO All Division 5 Conference
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IUFRO All Division 5 Conference

5.05 D

Composites science

Tung-Lin Wu

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5.05 D: Composites science

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Manufacture of Agroforest Waste Particle-Plastic Composite and Its Properties

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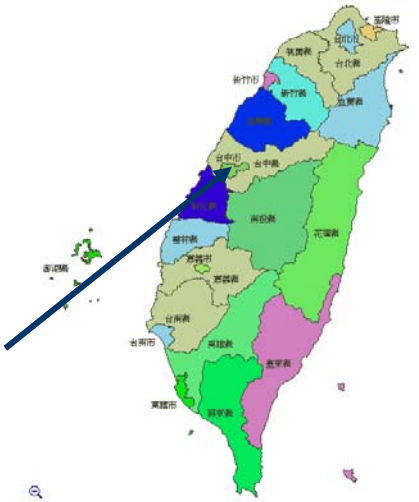


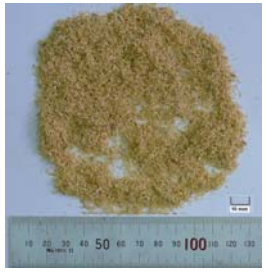
Material and methods

Agroforest Waste Particle (AWP)

Wood particles

(**W**)

60%, 70%, 80%



Bamboo particles

(**B**)

60%, 70%, 80%

Rice-hull particles

(**R**)

60%, 70%, 80%

High density polyethylene

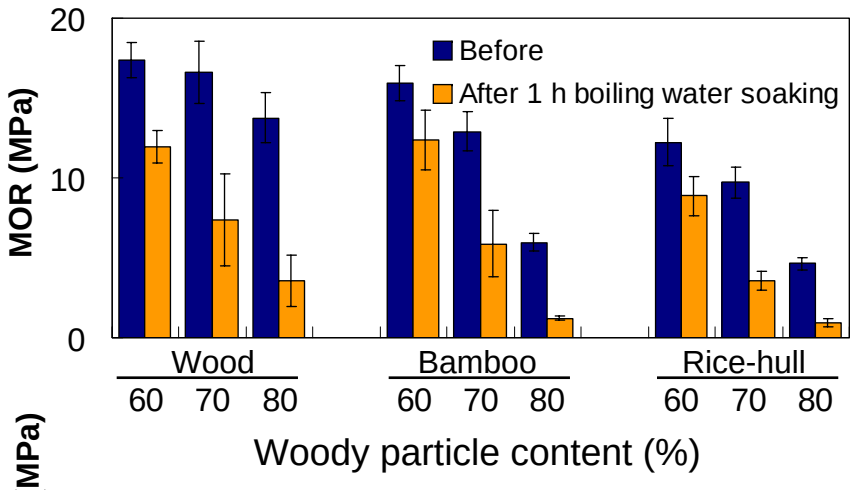
(**HDPE**)

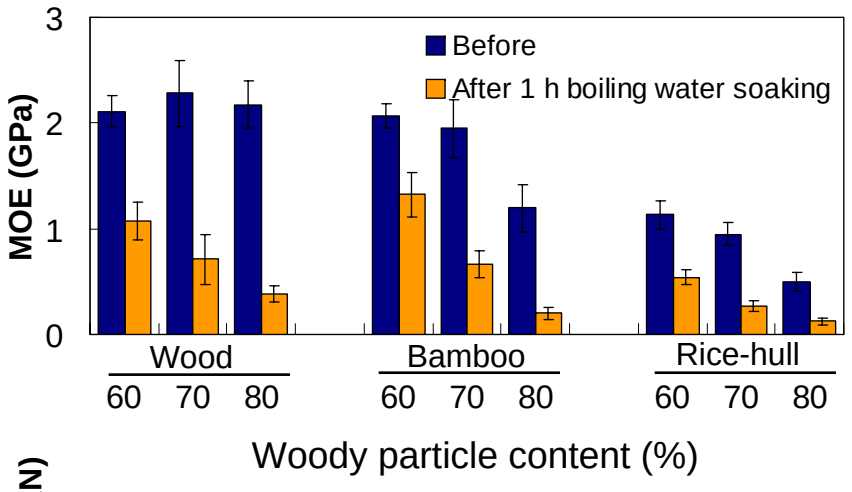
20%, 30%, 40%

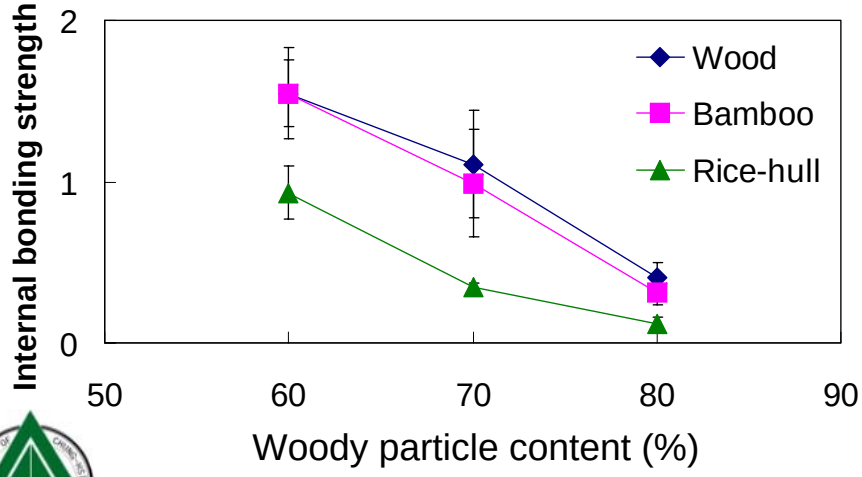
Pressing temperature: 200°C

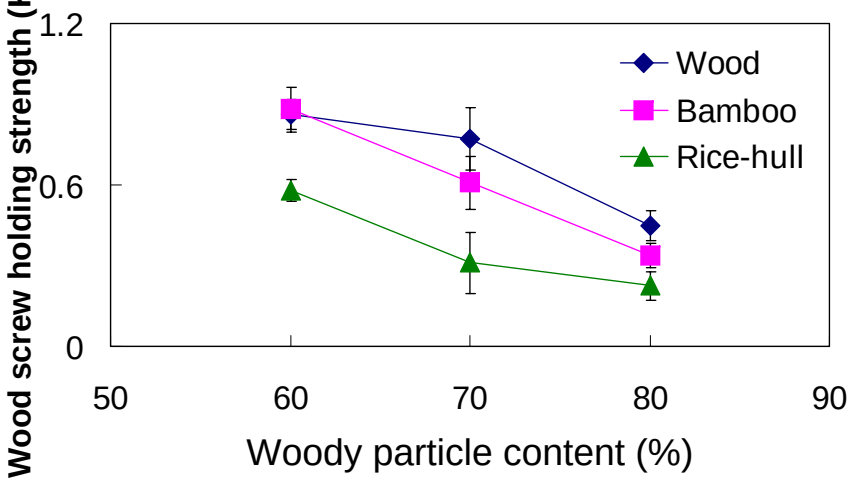
Pressure: 2.5 MPa

Results


MOR (MPa)
20
10
0
Before
After 1 h boiling water soaking
Wood
Bamboo
Rice-hull
60 70 80
60 70 80
60 70 80
Woody particle content (%)


MOE (GPa)
3
2
1
0
Before
After 1 h boiling water soaking
Wood
Bamboo
Rice-hull
60 70 80
60 70 80
60 70 80
Woody particle content (%)


Internal bonding strength (MPa)
2
1
0
Wood
Bamboo
Rice-hull
50 60 70 80 90
Woody particle content (%)


Wood screw holding strength (KN)
1.2
0.6
0
Wood
Bamboo
Rice-hull
50 60 70 80 90
Woody particle content (%)

Conclusions

Effect of stick agent

- ✓ The stick agent could improve the uniform distribution of plastic powders in the composited boards.

Physical properties of AWPPC

- ✓ After 24 h water immersion, water absorptions of all AWPPCs were ranged form 5.3 to 28.9%.
- ✓ After 24 h water immersion, thickness swelling were between 3.4 and 16.2%.

  Both values **increased with increasing the amount of AWP**.
- ✓ The W60P40 composited board showed the best bending strength (17.4 MPa), whereas the R80P20 was the lowest (4.6 MPa).