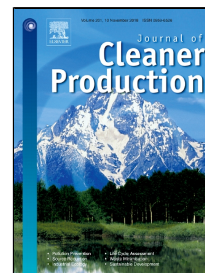


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## Forestry wastes filled polymer composites for agricultural use

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### Abstract

Two kinds of polymer composites were prepared using poly(vinyl alcohol) as binder and forestry or wood processing wastes as fillers. In one kind of the composites pine needle meal was used as filler while the other kind of the composites was filled with pine bark meal. Glycerol and oleic acid were used for the modification of mechanical, sorption properties and solubility of the composites. The films of the composites were fabricated and their mechanical, viscoelastic and antifungal properties as well as water absorption and solubility in water were studied. Mathematical experiment design was used to evaluate influence and importance of both glycerol and oleic acid content on of mechanical properties, solubility and water absorption of the composite films filled with pine bark meal. The second order polynomial models were developed in order to find out optimal content of both glycerol and oleic acid in compositions. Exploitation properties of the composite pots prepared from the composites were studied and vegetation tests were performed. It was shown that evaporation rate of water through the walls of the composite pots was by 45% lower and the temperature of substrate in the composite pots was by 3–4°C higher as compared with the corresponding characteristics of peat pots. Plants cultivated in the composite pots had better developed root system relative to those cultivated in peat pots.

### Graphical abstract



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