

Using Tree Barks as Organic Seedling Substrate

and the Nursery Effect in Yunnan, southwest China

Jiangchong Wu, Yanping Zhang, Shuhui Li, Siteng He, Yixing Zheng
Research Institute of Resource Insects, Chinese Academy of Forestry, Kunming, China

1. The Processing of Seedling Substrate by Tree Barks

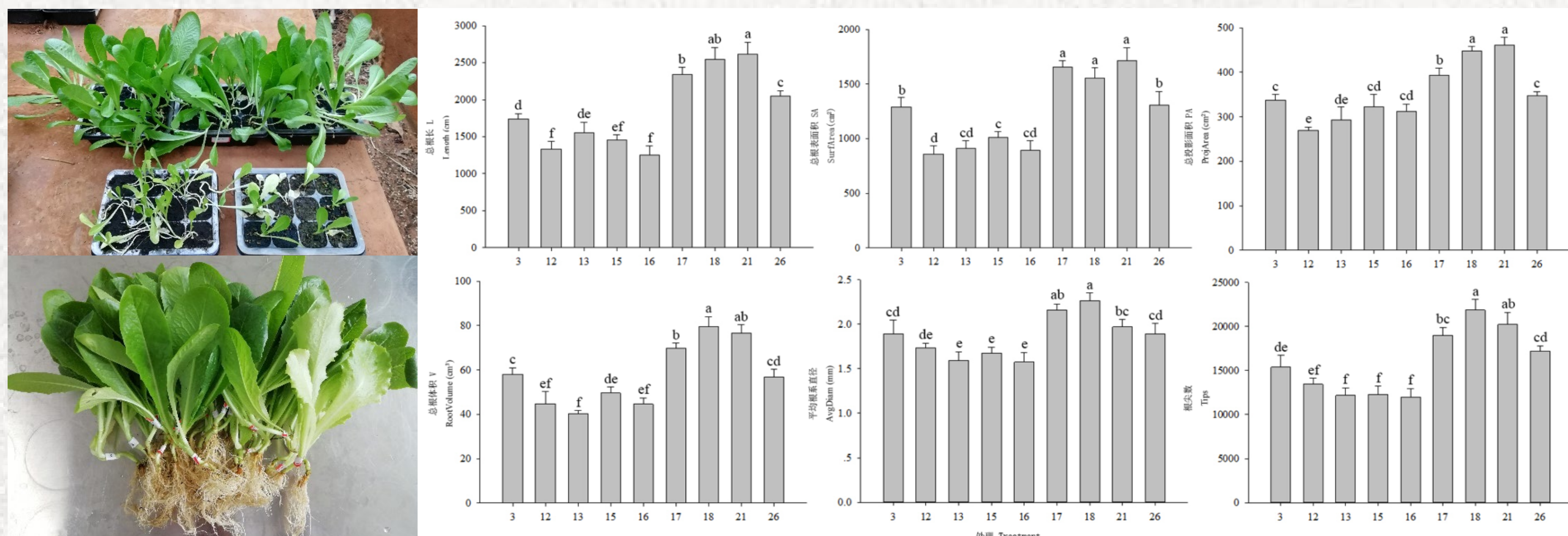
Compared with soil, cultivation using organic substrate could increase crop yield, optimize quality, reduce diseases and insect pests, save water and fertilizer, and save labor and cost. The peat, which is currently the most popular organic substrate in the market, is a natural non-renewable resource, and its formation requires special wetland conditions and a long historical period. Correspondingly, wood industrial wastes such as barks are cheap, easily-obtained and stable in physical and chemical properties, which can be used as alternative materials for mass production of organic nursery substrate.

In order to improve the utilization value of tree barks in this environmentally friendly way, microorganisms were used to decompose it and make it become an organic substrate with physical and chemical properties similar to peat moss.



2. The Effect of Bark as Seedling Substrate

After cultivating various economic plants, it is suggested that tree barks which had been decomposed could be used as substrate instead of peat moss, which was suitable for growing seedlings of crops and trees, such as broccoli, lettuce, tomato, tobacco, moringa and pine.



3. The Quality of Bark Substrate

In line with the relevant national standards.

Index	YC/T 310-2009	DB53/T 112-2004	Fermented bark	Peat
pH	5.0~7.0	5.6~6.8	6.01~7.26	5.20
1-5 mm particles %	≥40	≥40	41~68	39.1
Bulk density g/cm³	0.10~0.35	0.15~0.35	0.23~0.35	0.28
Porosity %	80~95	70~95	76.51~89.24	80.73
Organic content %	≥15	≥20	63.71~85.61	68.02
Humic acid %	10~40	≥15	15.70~27.00	23.51~36
Electric conductivity μs/cm	≤1000	≤800	676~774	652
Fe²⁺ mg/kg	≤1000	≤1000	201~943	3331
Mn²⁺ mg/kg	N/A	≤100	64~97	103
Moisture %	20~45	30~50	26.5~45.06	36.8
N mg/kg	N/A	N/A	1116~1421	732.06
K mg/kg	N/A	N/A	1240~2997	603.97
P mg/kg	N/A	N/A	41.02~106.41	68.02

4. China Patent for Invention

As a substrate and an organic fertilizer.



5. Application on scale

Applied to crops and trees.

