

Wrapping Materials for *Camellia oleifera* Abel Hypocotyl Grafting

Donglin Zhang^{1,2}, Jiangfan Yu^{1,3}, Xuemin Zhao⁴, Shaoliang Zhang⁵, and Qiuping Zhong^{1,4}

¹College of Resource & Environ., Central South Univ. of Forestry and Tech., Changsha, Hunan 410004, China

²Dept. of Plant, Soil and Environmental Sciences, University of Maine, Orono, ME 04469, USA

³Department of Forestry, Nanchang, Jiangxi 330046, China

⁴Experimental Center of Subtrop. Forest, Chinese Academy of Forestry, Fenyi, Jiangxi 336600, China

⁵Qinglong High Tech, Yichun, Jiangxi 336000, China

Introduction

Tea oil camellia (*Camellia oleifera* Abel) is high-grade cooking oil in China and some other Asian countries. Hypocotyl grafting (Fig. 1) is an effective way to reproduce elite tea oil camellia cultivars for their plantation (Fig. 4). Since the underground hypocotyl stock is very young and fragile, wrapping materials for the grafting union have to be selective. This study investigated three wrapping materials, which affected the survival rate and growth of grafted plants.

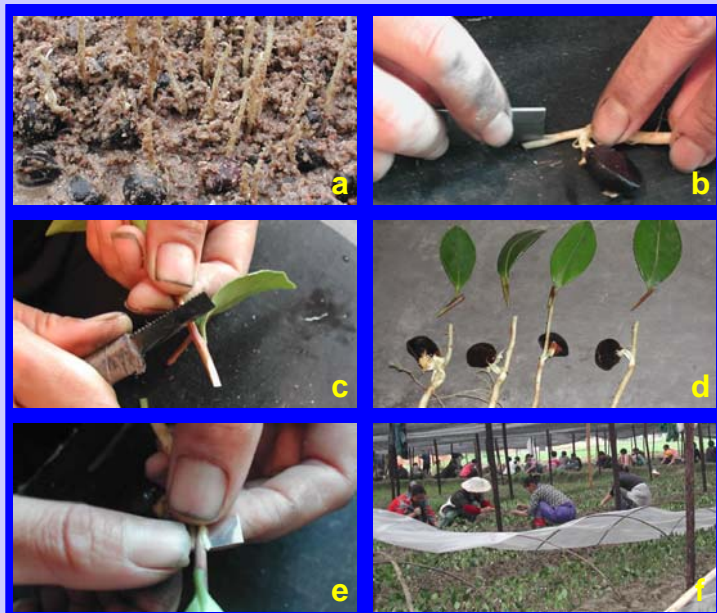


Figure 1: Hypocotyl Grafting of *Camellia oleifera*. a. seed germination in sand; b. prepare "rootstock" portion by splitting hypocotyl, also trim the radicle; c. prepare one node scion; d. both scion and rootstock are ready; e. graft the scion and wrap with aluminum foil; f. transplant into the shaded field and covered with plastic (as a tunnel).

Materials & Methods

Camellia oleifera 'Ninglin' is a selected cultivar with high-yield of quality oil. One node scion of "Ninglin" was grafted on the underground hypocotyl stock and wrapped with grafting tape, metal twist, and aluminum strips (Fig. 2) that cut from aluminum toothpaste tube in April 2006. All grafted plants were planted in the prepared rice fields with raising beds. A randomized completed block design was employed for this experiment and a total of 4 blocks. Each wrapping material in each block had 100 grafted plants (Fig. 4). Data were taken in September 2006 and analyzed with a SAS program.

Reference:

Chen, Y.Z. and D.B. Wang. 2001. Variety selection and their application of *Camellia oleifera* in Hunan. *Hunan Forestry Science and Technology* 28(3):23-27.

Han, Ninglin. 1997. Hypocotyl grafting of tea oil camellia. Agricultural Publishing House, Beijing, China.

He, F. and B. He. 2002. Distribution and habitat for cultivated *Camellia oleifera*. *Scientia Silvae Sinicae* 38(5):64-72.



Figure 2: Aluminum strips.

Results & Discussion:

Wrapping materials significantly affected the survival rate. Plants wrapped with strip reached 81.0%, while the plants with twist and tape were 70.0% and 68.5%, respectively (Fig. 3). It is possible that tape and twist were too tight for soft hypocotyl tissues, which led to the death of some grafted plants. Plant height was significantly taller for strip (8.28cm) and tape (8.29cm) than twist (6.13cm). Obviously, survival grafted plants with twists did not have too much room for growth. The twists should be removed as soon as the grafted union connected. Stem diameter at the ground level did not have too much difference. Shoot proliferation was significant higher for strip and average 1.32 shoots were observed. Only 1.19 and 1.15 shoots were for twist and tape. Subsequently, axillary bud-break was statistically lower for twist than strip and tape. Field beds prepared with manure at rate of 1,500 kg·ha⁻¹ produced significant stronger and better branched plants. Obviously, aluminum strip is a better material for wrapping tea oil camellia hypocotyl grafting union. Further studies should focus on source and preparation of aluminum strips or similar materials.

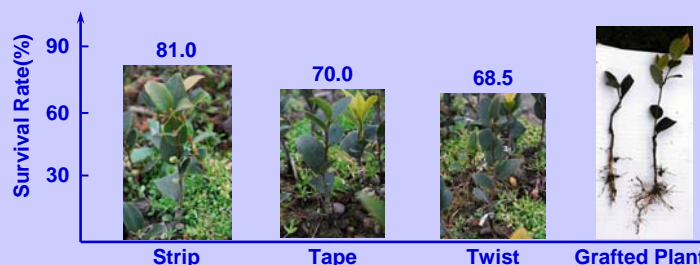


Figure 3: Effect of wrapping materials on survival rate of hypocotyl grafting plants.



Figure 4: Field planting of hypocotyl grafted *Camellia oleifera* plants. a. newly planted grafted plants with a randomized complete block design and b. growth of grafted plants in their 2nd year.