

## A Basic Study on Growth Characteristics of *Dendropanax morbifera* in Southern Part of Korea

Seong-Kyu Choi

Department of Oriental Medicine Resources, Suncheon National University, Suncheon 540-742, Korea.

### ABSTRACT

This study was carried out to obtain basic information for growth characteristics by different age of *Dendropanax morbifera* in southern part of Korea, such as at Suncheon, Haenam, Gangjin, Wando. The pH of soil in cultivation area was 5.2 to 5.6 and organic matter was very high up to 10.6%. P<sub>2</sub>O<sub>5</sub> content of soil in cultivation area was 35.3 to 42.1 mg/l, C.E.S was 13.9 to 14.4 me/100g, and moisture rate was 19.2 to 21.1%. The flowering of *Dendropanax morbifera* began from 6~7 years old tree. The flowering date was at 10th of July at Wando. The growth characteristics of 12 years old tree was 929.5cm in stem height, 134.1mm in stem diameter, and 15 years old tree was 1,117.9cm in stem height, 160.8mm in stem diameter. The number of leaf was 13.9 at five years old tree, and the petioles length was 12.6 at five years old tree. Xylem sap can be had at more than 10 years old tree with good growth more than 10 cm stem diameter.

**Key Words :** *Dendropanax morbifera*, Flowering time, Xylem sap, Growth characteristics, Cultivation area.

### INTRODUCTION

*Dendropanax morbifera* was distributed at southern part of Korea from the warm temperature zone of Japan, subtropical zone and Taiwan. *Dendropanax morbifera* was grown naturally at Wando, Cheju(Mt.Halla), Yecheon(Kermoon island), Sinan(Hong island), Jindo(Mt. Chermchill) and Haenam(Mt. Taedoon) in Korea(Kim etc 1993). The native of *Dendropanax morbifera* was distributed 30 to 280m above sea level at Taeyari, 150 to 200 m at Bogildo. But *Dendropanax morbifera* was cultivated very well at the field of

Suncheon and Wando subtropical experiment station with 5 to 10m above sea level(Choi etc.1997). A part of *Dendropanax morbifera* applied to medicinal purpose, but mainly milky liquid of *Dendropanax morbifera* have been used as resin paint and varnish at yellow lacquer handicraft traditionally. The flowering of *Dendropanax morbifera* was begun at 6 years old tree, and flowering time was at middle of July(Choi 1996). The fruit of *Dendropanax morbifera* was drupaceous fruit. The length and width of ovary was 7.8 to 10.7mm, 6.9 to 9.0mm, respectively, and the shape was elliptical. The ovary had 5 loculi with one seed per loculus, but one seed among 5 seeds was exalbuminous seed. The

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Corresponding author : **Seong-kyu Choi**, Department of Oriental Medicine Resources, Suncheon National University, Suncheon 540-742, Korea E-mail: skchoi@sunchon.ac.kr

length and width of seed was 6.3 to 7.4mm, 2.0 to 2.9mm, respectively, and 1000seed weight was 14.3 to 18.0g(Choi etc.1997).

The tree height was 7.6cm at one year old tree, 16.8cm at two years old tree, 41.7cm at three years old tree, 55.7cm at four years old tree, 110.4cm at five years old tree, 129.8cm at six years old tree, 548.8cm at ten years old tree, and the stem diameter was 2.5mm at one year old tree, 3.4mm at two years old tree, 9.4mm at three years old tree, 16.5mm at four years old tree, 20.5mm at five years old tree, 34.1mm at six years old tree, 100.8mm at ten years old tree(Choi, 1996). The number of leaf was 4~5 at one year old tree and 13~14 at five years old tree. The petioles length was 2~3cm at one year old tree and 10~11cm at five years old tree.

The 6 years old tree could not treat as a adult tree because only more than 8 years old tree could collect sap(Choi etc, 1997). The sap of *Dendropanax morbifera* generally could collect at more than 10 years old tree with good growth more than 10cm stem diameter.

This study was carried out of obtain basic information for growth characteristics by different age of *Dendropanax morbifera* in southern part of Korea.

## MATERIALS AND METHODS

Cultivation experiment of *Dendropanax morbifera* was carried out at Wando subtropical experiment station in Chonnam from 1995 to 1998 and native area of *Dendropanax morbifera* investigated at a hillock of

Taeyari near the Wando experiment station, Sunchon, Gangjin, Haenam and Wando in southern part of Korea. The environment of native and cultivation area investigated soil color and moisture, PH, OM(organic matter), C.E.C(me/100g). Potassium phosphate(mg/ l ) and light with Quadrat by phytosociology method. The weather situation of native and cultivation area was investigated at Wando and soil of 10cm under soil surface was analyzed at Taeyari, Sunchon, Gangjin and Haenam in southern part of Korea. To investigate growth characteristics in different tree age, the seed sown to pot and field at April every year from 1995 to 1998.

## RESULTS AND DISCUSSION

The results according to the soil characteristics of cultivation area of *Dendropanax morbifera* was shown as table 1.

The pH of soil in cultivation area was 5.2 to 5.6 and organic matter was very high up to 10.6(%). Potassium phosphate content of soil in cultivation area was 35.3 to 42.1(mg/ l ), C.E.S was 13.9 to 14.4 (me/100g), and moisture rate was 19.2 to 21.1(% ). The pH of soil in cultivation area was 5.2, and organic matter was 9.8(%), and P<sub>2</sub>O<sub>5</sub> content of soil in cultivation area was 35.7(mg/ l ), and C.E.S was 13.2 (me/100g), and moisture rate was 18.2(%) at Taeyari in Wando(Choi etc, 1997).

The results according to different tree age of *Dendropanax morbifera* was shown as table 2.

**Table 1.** The soil characteristics of cultivation area of *Dendropanax morbifera*.

Districts	PH (1:5)	OM. (%)	P <sub>2</sub> O <sub>5</sub> (mg/ l )	C.E.C. (me/100g)	Moisture rate (%)
Sunchon	5.6	8.8	35.3	13.9	19.2
Haenam	5.3	9.4	42.1	14.2	21.1
Gangjin	5.2	10.6	38.6	14.1	20.2
Wando	5.2	9.8	40.7	14.4	20.6

**Table 2.** Variation of growth traits according to different tree age of *Dendropanax morbifera*.

Tree Age	Flowering date	Tree height (cm)	Stem diameter (mm)	No. of leaf (ea)	Petiole length (cm)
One Year	-	6.9	2.3d <sup>x)</sup>	5.1	2.6
Three Year	-	45.4	8.9d	8.0	4.0
Five Year	-	98.7	19.4d	13.9	12.6
Seven Year	Jul. 10th	155.6	66.5b	-	-
Nine Year	Jul. 17th	712.8	90.5b	-	-
Twelve Year <sup>y)</sup>	Jul. 20th	929.5	134.1a	-	-
Fifth Year <sup>y)</sup>	Jul. 12th	1117.9	160.8a	-	-

<sup>x)</sup> : Same alphabetical letters indicate nonsignificant difference at 0.05 probability level of DMRT.

<sup>y)</sup> : *Dendropanax morbifera* of native area(Wando)

The flowering of *Dendropanax morbifera* began from 6~7 years old tree. The flowering date was at 10th of July at Wando. The flowering of *Dendropanax morbifera* was begun at 6 years old tree, and flowering time was at middle of July(Choi 1996).

The tree height was 6.9 cm at one year old tree, 45.4cm at three years old tree, 98.7cm at five years old tree, 155.6cm at seven years old tree, 712.8cm at nine years old tree, 929.5cm at twelve years old tree and 1,117.9cm at fifth years old tree. The stem diameter was 2.3mm at one year old tree, 8.9mm at three years old tree, 19.4mm at five years old tree, 66.5mm at seven years old tree, 90.5mm at nine years old tree, 134.1mm at twelve years old tree and 160.8mm at fifth years old tree. The tree height was 7.6cm at one year old tree, 41.7cm at three years old tree, 110.4cm at five years old tree, 548.8cm at ten years old tree, and the stem diameter was 2.5mm at one year old tree, 9.4mm at three years old tree, 20.5mm at five years old tree, 100.8mm at ten years old tree(Choi etc, 1997).

The number of leaf was 5.1 at one year old tree, 8.0 at three years old tree and 13.9 at five years old tree. The petioles length was 2.6cm at one year old tree, 4.0cm at three years old tree and 12.6 at five years old tree.

The 6 years old tree could not treat as a adult tree because only more than 8 years old tree could collect sap(Choi etc, 1997). The sap of *Dendropanax morbifera* generally could collect at more than 10 years old tree with good growth more than 10cm stem diameter.

Therefore, we require further examination for accelerating the growth and improving variety with high ability to produce sap of *Dendropanax morbifera*.

## CONCLUSION

This study was carried out obtain basic information for environment of cultivation area and growth characteristics by different age of *Dendropanax morbifera* in southern part of Korea, such as the *Dendropanax morbifera* was grown naturally and cultivation at Sunchon, Haenam, Gangjin, Wando.

The soil characteristics of native area were 5.2 to 5.6 in pH, 8.8 to 10.6% in content of organic matter and 19.2 to 21.1% in soil moisture. P:O<sub>5</sub> content of soil in cultivation area was 35.3 to 42.1mg/ l , and C.E.S was 13.9 to 14.4 me/100g.

The flowering of *Dendropanax morbifera* was begun at 7 years old tree, and flowering time was at 10th of July. The tree height was 6.9 cm at one year old tree,

45.4cm at three years old tree, 98.7cm at five years old tree, 155.6cm at seven years old tree, 712.8cm at nine years old tree, 929.5cm at twelve years old tree and 1,117.9cm at fifth years old tree. The stem diameter was 2.3mm at one year old tree, 8.9mm at three years old tree, 19.4mm at five years old tree, 66.5mm at seven years old tree, 90.5mm at nine years old tree, 134.1mm at twelve years old tree and 160.8mm at fifth years old tree. The number of leaf was 5.1 at one year old tree, 8.0 at three years old tree and 13.9 at five years old tree. The petioles length was 2.6cm at one year old tree, 4.0cm at three years old tree and 12.6 at five years old tree.

Xylem sap can be had at more than 10 years old tree with good growth more than 10 cm stem diameter.

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