

Production and Quality of Mountain Ginseng

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Abstract

Wild ginseng production is increasing due to forest recovery for last 30 years. Total number of Symmani (traditional mountain ginseng digger) was 558 in 2001. Provincial distribution of Symmani in 2001 was highest in Kangwon (32%), next in Choongbook (21%) and least in Jeonnam (0.7%) and Kyoungnam (0.9%). Age distribution of Symmani was 33% for forties, 32% for fifties and 20% for sixties. There were 8 persons in eighties. Symmanies are still keeping traditional ritual for mountain god serving clothes of colored ribbons and foods. Increased production induced open market system from underground dealing of mountain ginseng. Korea Mountain Ginseng Association established mountain ginseng assessment committee with professional Symmanies in 2001. From September to November in 2001, 987 roots were requested for quality assessment to the committee and 476 roots (48%) were passed and graded and others were rejected. Highest frequency of rejection was foreign origin. Pass rate was highest (74%) in Choongnam suggesting best place for quality. Number of collected roots in each province was positively correlated ($p=0.05$) with number of Symmanies. There are 3 quality groups of mountain ginseng, Heaven (pure natural), Earth (from seeding of wild ginseng) and Man (from seeding or seedling of wild ginseng with slight environmental modification). The relationship between price and age was polynomial in high quality root, Heaven, Earth and seed long head of Man group, and linear in low quality group, seedling long head of Man. The best one in 2001 was 26 g, 124 years old and sold with 109 million won. Quality criteria are age, shape, weight, color and healthy outlook. Fine roots are criteria for health status of roots and taproot is criteria for efficacy and called as medicine barrel. The implication is that ginsenosides have rarely been experienced for efficacy. The quality criteria of cultivated ginseng were originated from those of mountain ginseng. It is unique for mountain ginseng that only fresh one can be on market. Since quality criteria of mountain ginseng must be based on the efficacy experience it is well expected that present criteria might almost be established at the age of Shinnong Materia Medica.

Introduction

Korea is mountain country and the home of ginseng. Mountains occupy 65% of land area and wild ginsengs grow countrywide. Record of first finding of mountain ginseng is about 40,000 years ago. The 4th Dan Goon, Osagoo (King of the old Joseon) prayed to the three gods of Mt. Tae-baeg during patrol of northern part and found a mystic plant that was called as ginseng or hermit medicine (BC 2137). Thereafter the tale of never-die supernatural hermit has been related to the protection of essence chi (精氣) with maintain ginseng collected (Han Dan Gogy 1986). This strongly indicates that mountain ginseng collection started very early in history. Since mountain ginseng has been collected and sold through some private lines without any open market there was no data on mountain ginseng, especially wild one. We proposed the open market system for mountain ginseng for both diggers and consumers in Symposium on Rehabilitation of Mountain Ginseng (2000).

Korea Mountain Ginseng Association investigated Symmanies (traditional mountain ginseng digger) mostly by visiting during 2000~2001 for establishing the assessment method and selection of Symmani for panel. From 2001 Korea Mountain Ginseng Association started wild ginseng auction with the price, which was determined by the panel of 10 Symmanies. Korea Mountain Ginseng Association has been establishing infra structure for mountain ginseng research. Mountain Ginseng Research Association was organized in 2001 and had 1st and 2nd Symposium on Mountain Ginseng, in 2001 and 2002, respectively.

We reported here the traditional quality criteria, and quality-price relation of the applied mountain ginsengs to Korea Mountain Ginseng Association from September to November in 2001.

Mountain ginseng quality criteria

Growing place: most important quality factor is production place. Foreign origin such as introduced from China and North America is rejected. Foreign origin can be distinguished according to arrangement of stem traces, shape, wrinkles of various parts, orientation of branch roots in upper part and skin color etc. Production place in country is little effective though there is tendency of higher value to one collected in the middle part (Choongcheong province).

Origin and Group: There are three groups in mountain ginseng, Heaven (Cheon), Earth (Jee), Man (Yin) group (種, Jong) according to origin and environment. Heaven group (天種) is pure

natural. Earth group (地種) is ones grown from Heaven group seeds moved by animal, especially birds. Thus wild ginsengs grown in mountains near ginseng fields are considered as Earth group by some Symmanies. Earth group seems to mean that the environment, soil and surrounding plants, is not disturbed. Man group (人種, Yin Jong) is commonly called Long Head (long rhizome, 長腦). Man group is divided into two sub-groups, Seed long head (刈長腦) and Seedling long head (苗長腦). Seed long head is grown by direct seed sowing with slight modification of soil and areal environment. Seed long head is most similar to the wild-simulated. Seedling long head is grown by transplanting seedling instead of direct sowing and near to the woods-grown. Seed and seedling for Man group must originate from the seeds of Heaven or Earth group. It was told among Symmanies that if the field

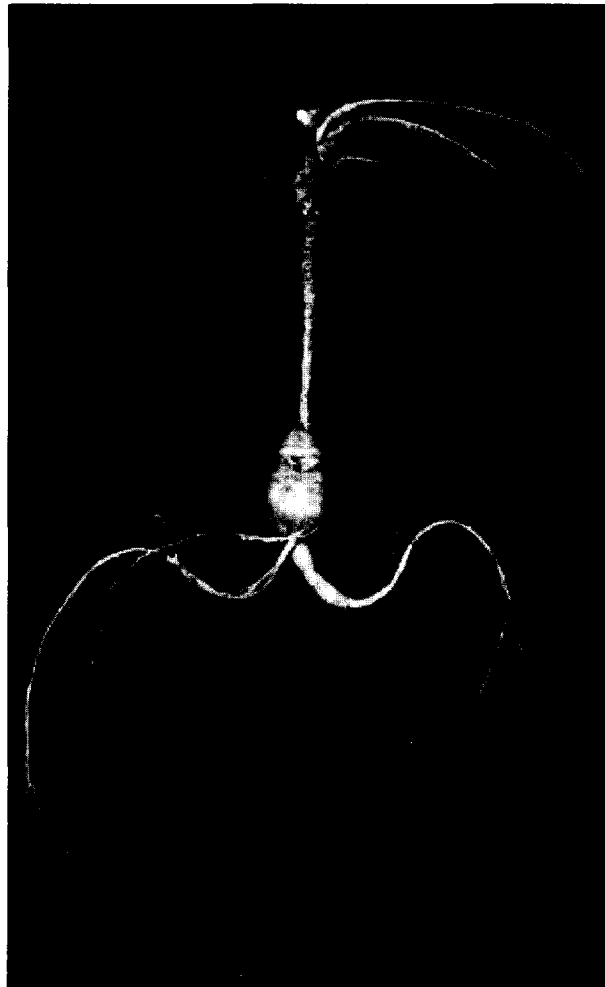


Fig. 1. Ball shape of mountain ginseng.

cultivated seeds are used it needs at least 4 generations to become mountain ginseng line. The mountain ginsengs over 50 years

old that originate from Earth and having Heaven group shape are considered as Heaven group.

Age: Stem traces in rhizome are not unique source of age. Traces of fine roots on small roots are other source for age. Won Noe (原腦, primary head or primary rhizome) is the rhizome of earliest stage from the seeds. It is small round rhizome with various slightly protruded spots of contracted stem traces (Fig. 1). There is no clean stem traces on Won Noe. Won Noe appears not in every root. Frequency of Won Noe is rather rare. Even if age is assessed by number of stem trace alone 7 or 8 years must be added to it for true age. Since some roots lost all or part of rhizome and in some cases new shoots started at the middle of rhizome stem traces alone could not be enough for age assessment. Root less than 10 years old is rejected. Root age is one of important traditional criteria for quality assessment.

Shape: There are some shapes of main body and branch roots for good quality. Man shape, such as



Fig. 2. The highest quality mountain ginseng, 26 g, Heaven group, 2001.

Chinese character of man (人) is best (Fig. 2). Round ball shape (Fig. 1) is also highly evaluated. In this case, main body is called “medicine barrel (藥桶)”. Fine and small root are only an indicator of healthiness or growth status of ginseng plant. Such criteria are adopted to the cultivated ginseng in which all fine and small roots are eliminated for white and red ginseng.

Weight: Root weight is much depending on main body size. The larger the “medicine barrel” the better the quality. Weight unit is yang (兩, 37.5 g). The root greater than one yang is expensive. The price of two yang root is greater than twice of one yang root. Root weight is also important quality factor for the field-cultivated ginseng.

Skin color: White-yellow like the color of ginkgo nut is best. It is same for the field-cultivated fresh root.

Freshness: Fine root status indicates freshness of root. For the freshness all mountain ginsengs must be kept between two sheets of mountain moss as shown in Fig. 2.

Symmani

Symmani (심마니) means ginseng (sym) and mani (man), ginseng digger. They pray to mountain



Fig. 3. Pray of Symmanies to mountain god for abundant ginseng and safty in mountain.

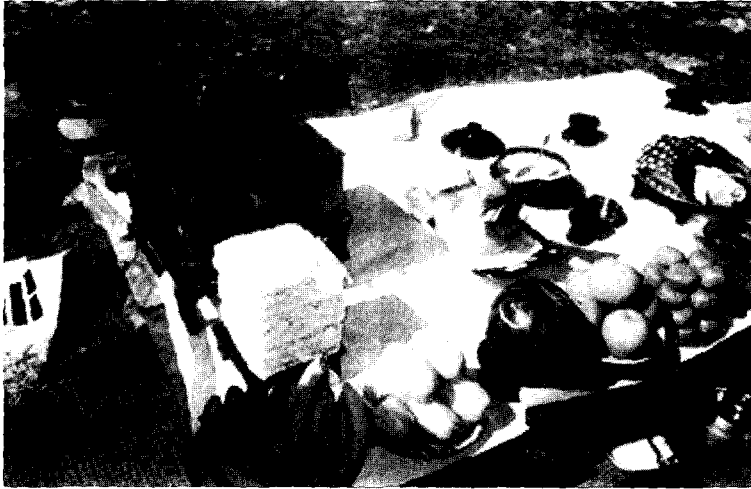


Fig. 4. Dish display on table for serving to mountain god.

gods according to the traditional ritual since immemorial time. Eoinmani (어인마니), mostly elderly Symmani leads the ritual with praying in large voice according to his memory (Fig. 3).

The three color ribbons are ye-dan (禮緞) for amusing mountain god with new clothes. The ribbons are placed on the white traditional Korean paper in front of the position post of mountain god, just back of the table of displayed dishes (Fig. 4). The ribbons of red, yellow and blue clothes are hung up on the tree with a bundle of white thread as the last event of praying ritual. Sometimes the ribbons are kept in vacant place between rocks where protected from rain. Mountain gods like new clothes and foods in Symmani world. Though see food is served pig head is also one of special food served to



Fig. 5. Colored ribbons on a tree in American native's village, Aug. 2002.

Table 1. Provincial distribution of Symmani

Province	Seoul	Kyonggi	Kangwon	Choongbook	Choongnam
Number	22	64	183	115	33
Distribution(%)	4	11	32	21	6
Province	Jeonbook	Jeonnam	Kyongbook	Kyongnam	Total
Number	72	4	60	5	558
Distribution(%)	13	1	11	1	100

Table 2. Age distribution of Symmani.

Age	20s	30s	40s	50s	60s	70s	80s	Total
Number	2	47	185	177	114	26	7	558
Distribution(%)	0.4	8.4	33.2	32	20.4	4.7	1.2	100

mountain god (Fig. 4). Symmani believes that San Sin (mountain god) leads him to mountain ginseng through Mong (夢, dream), especially when his mind is calm and no any desire. Blue, red and yellow are related with heaven, earth and man. White means pureness of all being. It is very interesting that the same 3 to 4 color ribbons hung up on tree can be seen in American native's village (Fig. 5).

There has long been strict rules for wild ginseng collection among Symmanies. Small young plants should be left. Even old plants should be dugged for the immediate necessity. Such rules are not kept well among present young diggers. The rule of selective digging is a conservation method of mountain ginseng resource. Total number of Symmani was 558 in 2000–2001 (Table. 1).

It was highest in Kangwon province (32%) and Choongbook (21%), Jeonbook, Kyonggi, Kyongbook in decreasing order. Such provincial frequency seems to be related to mountain area. Age distribution of Symmani was highest in 40's (33%) and almost same in 50's (Table. 2). There were 7 persons in 80's. Above 70's might be professional and much experienced.

Production and quality during September to November in 2001

Provincial production (number) of mountain ginseng is highest in Kangwon (33%) and Choongbook(25%), Kyonggi, Kyongbook, Choongnam in decreasing order (Table. 3).

Kangwon and Choongbook were most active in number of Symmani and root production.

Total number of mountain ginseng showed significant positive correlation($p=0.05$) with number of Symmani (Fig. 6). Number of quality root (passed) was also positive correlation ($r=0.84$). The percentage of quality root (P/T in Table. 3) was highest in Choongnam (74%) and next Choongnam

Table 3. Provincial yield of mountain ginseng and assessment result by Symmani panel

	Passed (P)			Rejected(R)		Total (T)	
	Number	%	P/T	Number	P/T	Number	%
Kyounggi	56	11.8	35.2	103	20.2	159	16.1
Kangwon	174	36.6	53.9	149	29.2	323	32.7
Kyoungbook	25	5.2	24.3	78	15.3	103	10.4
Kyoungnam	-	-	0	7	1.4	7	0.7
Choongbook	143	30	57.7	105	20.6	248	25.1
Choongnam	57	12	74	20	3.9	77	7.8
Jeonbook	21	4.4	40.4	31	6.1	52	5.3
Jeonnam	-	-	0	18	3.5	18	1.8
Total	476	100	48.2	511	100	987	100

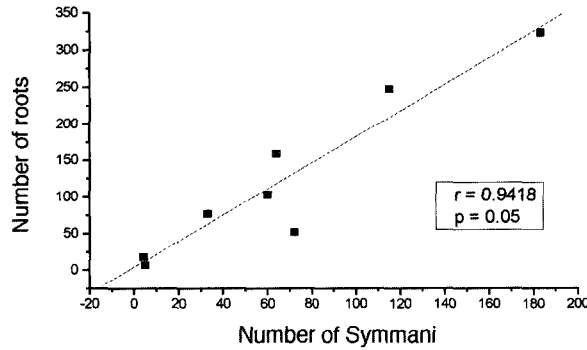


Fig. 6. The relationship between provincial Symmani population and production of mountain ginseng.

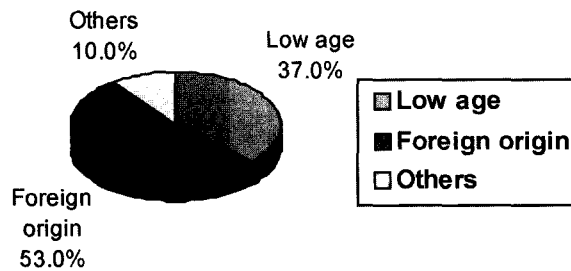


Fig. 7. Frequency of rejection factor of mountain ginseng.

(58%). It seems to be well accordance with the experience that the best quality is from the middle part of Korea. Choongnam, Choongbook and Kangwon (54%) showed greater pass rate (P/T) than that of country mean (48%) indicating a high quality production area.

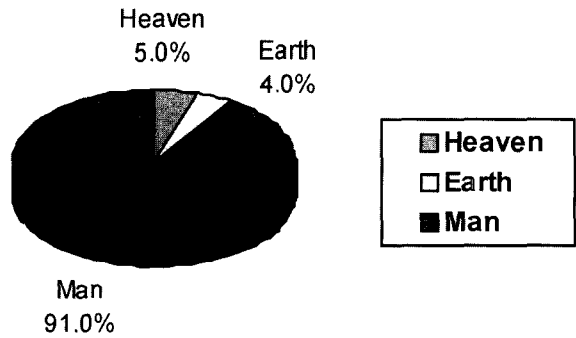


Fig. 8. Frequency of quality group of mountain ginseng.

Table 4. Distribution of quality group and root age of mountain ginseng.

Age range	Heaven	Earth	Man	Total
10~20	4	1	243	248
21~30	4	4	126	134
31~40	3	7	51	61
41~50	2	5	6	13
51~60	5	1	3	9
61~70	4	1	2	7
71~80	3	-	-	3
80~	1	-	-	1
Total	26	19	431	476

More than half of roots applied were rejected. Percentage of each rejection factor was highest in foreign origin (Fig. 7), mostly from China. Age factor (less than 10) was 37%. It was same in 1930's (Immamura 1930). Frequency in each quality group (Fig. 8) showed 91% in Man group, 5% in Heaven and 4% in Earth.

Root distribution in age range and quality group showed in Table. 4. The high aged ginseng with small number appeared in Heaven group while the low aged ginseng with long number in Earth group.

Relationship between age and price of mountain ginseng was significant polynomial only in low range both in Heaven ($p=0.0001$) and Earth ($p=0.0044$) group as shown in Fig. 9 and Fig. 10, respectively. Regression equation was $y=16.81X^2 - 1267x + 23522$ for Heaven group and $y=5.59 X^2 - 170.6x + 14415$ for Earth group. In Man group Seed long head showed significant polynomial

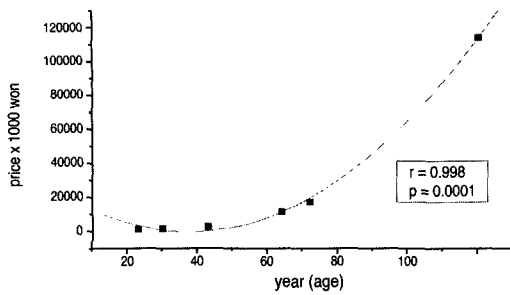


Fig. 9. The relationship between age and price of low range in Heaven group mountain ginseng.

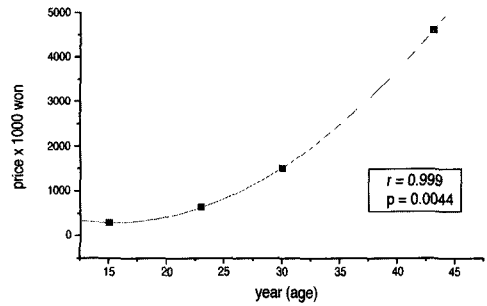


Fig. 10. The relationship between age and price of low range in Earth group of mountain ginseng

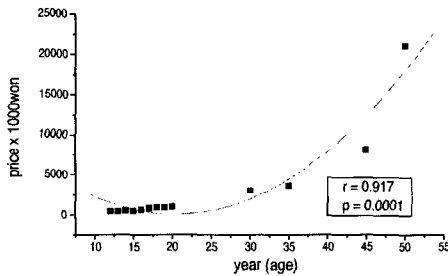


Fig. 11. The relationship between age and price of low range in Man group (Seed long head) of mountain ginseng.

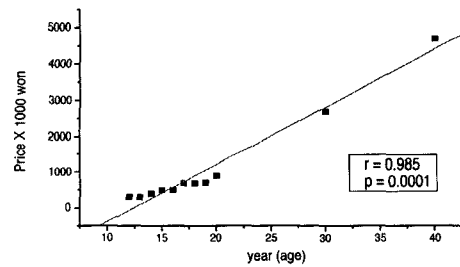


Fig. 12. The relationship between age and price of low range in Man group (Seeding long head) of mountain ginseng.

function ($p=0.0001$) but Seedling long head showed significant linear function ($p=0.0001$) as shown in Fig. 11 and 12, respectively. These results indicate that the increasing rate of price is much higher with the same increase of root age in high quality than low quality.

These results indicates that age is very important factor. One of reason may be due to that age generally increases root weight.

The highest price was 109,000,000won for one root of 26 g (Fig. 2). It was found in Pyoungchang, Kangwon province and assessed 120 years olds. Ball shape root (Fig. 1) was from Pyoungchang. Root age is very important quality factor in the field-cultivated ginseng too.

Conclusion

Traditional collection rule of mountain ginseng by Symmani is for sustainability of mountain

ginseng production. Production place, plant origin, shape, weight, age, skin color, and freshness are important quality factors that have long been established on experience. Quality system of mountain ginseng is same as for the field cultivated one. Production methods of mountain ginsengs must be developed since mountain ginsengs are high in efficacy and very rare and price is very high.

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