

A Basic Study on Utilization of *Angelica acutiloba* Kitag (Tanggung)

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ABSTRACT

This study was conducted to determine feasibility of utilization of *Angelica acutiloba*. Especially, the quality characteristics of bread prepared with the addition of *Angelica acutiloba* powder were investigated. Sensory evaluation and spoilage test were conducted for preparation of functional breads which added with ground plant matters (leaves and stems) from *Angelica acutiloba*. The result showed that the functional breads had high score of overall liking as well as low spoilage rate when added with 0.5 to 1.0% ground plant matters of *Angelica acutiloba*. Consumer acceptability evaluation showed a significant preference when added 0.5 to 1.0% ground leaves and stems of *Angelica acutiloba* into breads. Functional breads which added powder of *Angelica acutiloba* inhibited the growth of fungi. The more addition of *Angelica acutiloba* powder, the higher the degrees of this inhibited. These results suggested that the shelf-lives of the breads were extended by the addition of *Angelica acutiloba* powder. Further studies were required for improvement of functionality and diversity of bread products using medicinal plant materials as an additive.

***Kew words* :** *Angelica acutiloba*, functional bread, utilization, sensory evaluation, spoilage.

INTRODUCTION

Tanggung (Korean), Toki (Japanese), wild angelica, wild Chin Quai, Women's ginseng, Yuan Nan wild dong quai, Yungui and Dong quai (*Angelica sinensis*, *Angelica acutiloba*, *Angelica gigas*), and known as Chinese angelica, has been used for thousands of years in traditional Chinese, Korean and Japanese medicine. It remains one of the most popular plants in Korean medicine, and is used primarily for health conditions in

women. Dong quai has been called "female ginseng," based on its use for gynecologic disorders such as painful menstruation (dysmenorrhea) or pelvic pain, recovery from childbirth or illness and fatigue/low vitality. It is also given for strengthening *xue* (loosely translated as "the blood"), for cardiovascular conditions/high blood pressure, inflammation, headache, infections and neuropathic (nerve) pain (Louis, 2000).

The root of *Angelica acutiloba* (Siebold and Zucc.)

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Kitag, has been shown to be an effective analgesic and to have anti-inflammatory effects. Leaves of *Angelica acutiloba* contain 0.2-0.6% essential oil and vitamins B12, vitamins E as the large amount and bergaptem, ligustilide. *Angelica acutiloba* also can be utilized as a medicinal plant for vegetables because several ingredients in leaves of *Angelica acutiloba* have specific fragrance (Choi, 1994). The leaves are sometimes blanched, boiled, and eaten in salads or as a garnish with vegetables and meats. Leaf stalks may be candied and used in cakes and desserts (Michael, 2002).

Recently, many approaches for preparation of high-functional breads by adding medicinal plant powders are undertaken as a mean for maximizing demand of medicinal plants. Kim and Chung (2001) reported that functional breads were made from flour containing ground leaves of Korean persimmon. It was expected that functionality-enriched breads using medicinal plants would be a promising new brand for human's health and increasing of consumer acceptability.

Therefore, this study was carried out to obtain basic information for utilization of *Angelica acutiloba*.

Especially, the quality characteristics of bread prepared with the addition of *Angelica acutiloba* powder were investigated.

MATERIALS AND METHODS

For the preparation of functional breads, flour consisting of powder, yeast, salt and non-fatted milk was used (Park and Chung, 2003). Leaves, and stems of *Angelica acutiloba* were harvested at vegetative stage (Choi et al., 2004; Choi 2005), air-dried at low temperature, and ground by a mill. The sample were passed through 100 mesh screen.

The ground leaves, stems and root of *Angelica acutiloba* with amounts of 0.5, 1.0, 2.0, 3.0, 4.0, 5.0, and 10% dry matters were added into wheat flour for preparation of bread.

The mixture ratio of bread is shown in Table 1.

Main assessments for breads made from flour and ground medicinal plant materials were conducted through sensory evaluation and spoilage test (Larmond, 1970). For sensory evaluation breads stored at room

Table 1. Base formulars for bread prepared with *Angelica acutiloba* power.

Ingredient	<i>Angelica acutiloba</i> power (%) ¹⁾							
	Control	0.5	1.0	2.0	3.0	4.0	5.0	10.0
Flour	1000	995	990	980	970	960	950	900
Aa power ¹⁾	0	5	10	20	30	40	50	100
Sugar	100	100	100	100	100	100	100	100
Salt	20	20	20	250	20	20	20	20
Magarine	25	25	25	25	258	25	25	25
Shortning	25	25	25	25	25	25	25	25
Yeast food	2	2	2	2	2	2	2	2
Yeast	35	35	35	35	35	35	35	35
Egg	55	55	55	55	55	55	55	55
Milk powder	20	20	20	20	20	20	20	20
Wate	580	580	580	580	580	580	580	580r

¹⁾ Aa power : *Angelica acutiloba* power
(Ground leaves, stems and root of *Angelica acutiloba* power).

Table 2. Sensory characteristics of bread prepared with *Angelica acutiloba* powder

Ingredient	<i>Angelica acutiloba</i> power (%)							
	Control	0.5	1.0	2.0	3.0	4.0	5.0	10.0
Color	6.8a ²⁾	6.5a	6.1a	5.4ab	4.8ab	3.3b	3.1b	2.9b
Appearance	6.2a	6.0a	5.9a	5.14ab	4.5ab	4.1b	4.0b	3.2b
Odor	6.4a	6.1a	6.0a	5.2ab	4.9ab	4.3b	4.5b	2.4c
Taste	6.3a	6.2a	6.0a	5.4ab	4.9ab	4.8ab	4.6ab	2.5b
Chewiness	6.1a	6.0a	5.9a	5.1ab	5.1ab	4.8b	4.8b	4.4b
Adhesiveness	5.1a	5.4a	5.6a	4.8a	4.7a	4.5a	4.6a	4.3a
Oa. ¹⁾	6.3a	5.8a	5.1a	4.5ab	3.3b	3.0b	3.0b	2.4b

¹⁾ Oa.: Overall acceptability

²⁾ Values with different superscript in the same raw are significantly different at 5% level.

temperature for a day were used as samples. Twenty panel members were recruited from students of Sunchon National University. Attributes evaluated for each one were; color, taste, texture, flavor and overall liking. After these evaluations were completed, panelists were asked to rank all samples by treatment.

The scores were analyzed by a statistical method to determine significant difference among treatment means (Kim and Chung, 2001). Degree of spoilage was examined with 5 times at 1-day interval over 5 days, observing occurrence of fungi (green mold).

RESULTS AND DISCUSSION

Sensory evaluation

The results evaluated against all the attributes such as color, taste, texture, flavor and overall liking are shown Table 2.

Overall liking degree had high scores and had no significant difference comparing with untreated control when 0.5 to 1.0 % ground materials were added into breads. However, it was gradually decreased with increasing of adding amounts, especially showing the lowest score at 10.0 % amount. It was thought that the score was lowest because of green color.

In flavor evaluation, no significant difference was

observed up to 3% ground matters. However, addition with above 5.0% amounts exhibited lower scores in overall liking because of too strong scents. Taste value measured showed little bit bitterness due to increase of essential oils. Sensory values for firmness or texture showed lower scores in overall liking degree with increasing of adding amounts. This result was supported by Jung et al. (1977).

From sensory observation made during this study it was suggested that addition of ground plant matters at 0.5 to 1.0 % showed the best score in preference tests against all the attributes.

Spoilage test

Degree of spoilage in breads examined is shown Table 3.

Spoilage of the breads was reduced with increase of adding volume of medicinal plant materials. Especially spoilage degree significantly was reduced when above 3.0% ground matters were added into breads. This result shows that above 3.0% ground matters can extend preservation period up to 3 days compared with the control. However, when around 1.0% ground matters were added into breads, the storing period can be extended up to 1 to 2 days for preservation comparing with the control.

Table 3. Effect of *Angelica acutiloba* power on the fungi growth of functional bread at 25°C

Treatment	Storage period (days)				
	1	2	3	4	5
Control	-	Found	Found	Found	Found
Aa power ¹⁾ 0.5	-	Slightly Found	Found	Found	Found
Aa power 1.0	-	Slightly Found	Found	Found	Found
Aa power 2.0	-	Slightly Found	Found	Found	Found
Aa power 3.0	-	-	Found	Found	Found
Aa power 4.0	-	-	Found	Found	Found
Aa power 5.0	-	-	Found	Found	Found
Aa power 10.0	-	-	Found	Found	Found

¹⁾Aa power : *Angelica acutiloba* power (%)
(Ground leaves, stems and root of *Angelica acutiloba* power)

Functional breads which added powder of *Angelica acutiloba* inhibited the growth of fungi. The more addition of *Angelica acutiloba* powder, the higher the degrees of this inhibited. These results suggested that the shelf-lives of the breads were extended by the addition of *Angelica acutiloba* powder. Kang and Kim (2000) reported that Functional breads which added of Tunja orientals inhibited the growth of fungi.

In conclusion, consumer acceptability evaluation showed a significant preference when added 0.5 to 1.0% ground leaves and stems of *Angelica acutiloba* into breads. More detail study would be required for improvement of functionality and diversity of bread products using medicinal plant materials as an additive.

ANNOUNCEMENT

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