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'Hongaram': A Red Fruited, High Aroma Table Grape

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Abstract

'Hongaram' is a new table grape cultivar resulting from an interspecific (*Vitis* sp. x *Vitis vinifera*) cross. It is diploid, late-ripening, and red-fruited with a distinct muscat aroma. It had a mean date of bud break in trials of 24 Apr. at Suwon, Republic of Korea while full bloom and fruit maturity occurred on 5 June and 5 Oct., respectively. It has excellent flavor with abundant aroma and very good firmness. Mean berry weight was 5.7 g, and mean total soluble solids concentration was 19.6 °Brix. 'Hongaram' has good cold hardiness. It compares favorably with the cultivar 'Tano Red' in taste, aroma, and resistance to downy mildew. 'Hongaram' is the first table grape cultivar with muscat aroma introduced in Korea.

'Hongaram' originated from the cross 'Tano Red' × 'Muscat Hamburg' (Fig. 1) made at the National Institute of Horticultural & Herbal Science (NIHHS), Rural Development Administration (RDA), Republic of Korea, in 1989. 117 Tano Red , which has a large cluster (414 g) and red-skinned berries, was used as the parent because of its high yield and abundant juice while 'Muscat Hamburg' , which has mid-sized (5.8 g) blue-black berries, was used as the other parent because of its muscat aroma. The original seedling was planted in 1992 and was initially selected in 1998. Because of this selection's high-quality berries, distinct muscat aroma, and resistance to downy mildew, it was propagated for further trials and evaluated for four fruiting seasons (from 2006 to 2009) in the north (Chuncheon), middle (Suwon, Okcheun), and south (Jinju) of the Republic of Korea. 'Hongaram' was endowed with 'Wonkyo Ra-23' as the line identification number before cultivar registration in 2003, and was named finally after variety inspection during two years (2010~2011) at the Korea Seed & Variety Service, and was registered for cultivation in the Republic of Korea in 2012.

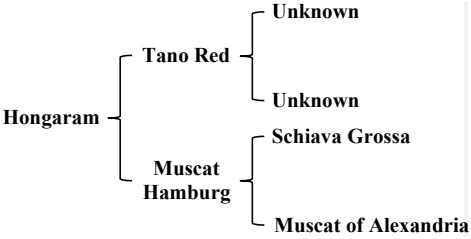

Fig. 1. Pedigree of 'Hongaram' grape

Three vines of three randomized plots at each location were planted for the evaluation of vine and fruit characteristics from 2003 to 2009. These vines were spaced 4 m (between rows) x 5 m (between plants) and trained to an overhead arbor. Pests (grape borer, grape leafhopper) and diseases (powdery mildew, ripe rot) were controlled with periodic fungicide and insecticide applications following the guidelines of the RDA (2003). No irrigation was applied during the seven-year evaluation period and weed management was by the use of a grass sward system. Cane spurs were pruned to two buds in February and flower cluster thinning was carried out 10 days before flowering. Harvest dates were based on fruit maturity.

Early ripe fruit of 'Hongaram' have a semi-crunchy flesh and an edible skin that frag-

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ments easily with the flesh. Fruit allowed to ripen further tend to have a softer flesh, become noticeably juicier, but retain an edible skin. A random sample of five clusters per vine/replicate was collected for determination of cluster and berry weights. Cluster weight was calculated by averaging the combined weights of the five-cluster samples. Berry weight was measured on a 10-berry subsample randomly selected from the five-cluster samples. The five-cluster samples were manually crushed and filtered through a double layer of gauze. Juice soluble solids concentration was measured using a digital refractometer (Atago PR-101, Japan) while tartaric acid was measured using an automatic titrator (Schott TitroLine alpha, Mainz, Germany). The juice was titrated to an endpoint of pH 8.2 using 0.1 mol·L^{-1} sodium hydroxide solution. The experimental vineyard at Suwon was at the NIHHS (lat. 37° 18' 34.34 N, long. 126° 58' 43.42 E). Based on an analysis of observed climate conditions for Suwon during 2006-2009, the average temperate, rainfall and sunshine duration were 12.2°C, 1,663 mm and 2,152 h, respectively.

Description

Flowers. The flowers of 'Hongaram' are perfect and self-fertile, and achieved full bloom in late May (26 May) after bud break in late April (24 April) in Suwon, Korea.

Fruits. Fruits of 'Hongaram' have red skin when fully ripened. The skin is medium in thickness and adheres to the flesh. The berries were resistant to cracking following rainfall near or at maturity. The flesh texture was firm and juicy. Berries had an average weight of 5.7 g, and the berry shape was round to ovate. Each berry had two to three seeds of 6.1 mm in length. When the grapes were fully ripe, the aroma of 'Hongaram' was similar to that of 'Muscat of Alexandria'. 'Hongaram' ripened between 26 Sept. and 5 Oct. or 1 to 5 d later than 'Tano Red' in Suwon, Korea. The mean total soluble solids (TSS) concentration of 'Hongaram' was 19.6 °Brix, or 2.0 to 3.0 °Brix higher than 'Tano Red'. Its titratable acidity was also higher than 'Tano Red' (Table 1). These values indicate that 'Hongaram' can accumulate satisfactory amounts of sugar while maintaining sufficient acidity. Although harvest dates and cluster weights were different at different locations within South Korea, the fruit characteristics of 'Hongaram' (such as skin color and flavor) were generally similar across all sites (Tables 1 and 2).

Clusters. The cluster size of 'Hongaram' was large, ranging from 450 to 511 g with 69 to 89 berries per cluster. Clusters were

Table 1. Fruit characteristics of the grape cultivars 'Hongaram' and 'Tano Red' at Suwon, Republic of Korea.

Cultivar	Harvest date	Cluster wt. (g)	Berry skin color	Berry wt. (g)	Soluble solids (°Brix)	Acidity (%)
Hongaram	1 Oct.	455±57[Z]	Red	5.7±0.4	19.6±1.6	0.70±0.16
Tano Red	30 Sept.	414±38	Red	6.0±0.6	16.7±1.3	0.60±0.13

[Z] Mean ± SD.

Table 2. Fruit characteristics of 'Hongaram' grape evaluated at three sites within Republic of Korea.

Region	Harvest date	Cluster wt. (g)	Berry skin color	Berry wt. (g)	Soluble solids (°Brix)	Acidity (%)
Chuncheon	26 Sept.	403±23[Z]	Red	4.9±0.2	17.7±0.2	0.55±0.15
Okcheun	27 Sept.	424±40	Red	4.7±0.2	18.2±0.1	0.53±0.12
Jinju	24 Sept.	450±38	Red	5.3±0.3	19.1±0.1	0.52±0.08

[Z]Mean ± SD.

conical in shape with a small shoulder. The berries set tightly and did not shatter during storage and transport (Fig. 2). Cluster appearance is excellent with uniform shape and abundant volume. The yield of 'Hongaram' is similar to 'Tano Red', approx. 18.0 Mg·ha^{-1} at 1200 vines·ha^{-1}, within a location and where the same training system is used.

Vines. 'Hongaram' had intermediate vine vigor and good cold hardiness with no bud damage occurring at -15°C in Suwon, Korea. Leaf petioles may be shorter than the leaf midrib. Tendrils had branches and developed opposite the leaves. Current season's shoots from dormant buds typically produced inflorescences at the third and fourth nodes.

Diseases. Symptoms of downy mildew (*Plasmopara viticola* Berl. & de Toni) have not been observed in 'Hongaram', based on comparative evaluations under conditions of low disease control, in which vines received only one application per year of chlorothalonil applied after bud burst. The trunk was also resistant to crown gall (*Rhizobium vitis* (Ophel & Kerr) Young et al.). Own-rooted vines of 'Hongaram' were not evaluated for resistance to phylloxera due to low occurrence of this insect in soils in Korea.

'Hongaram' is the eleventh table grape cultivar developed by NIHHS in Korea and follows the release of 'Suok' (Yun and Park, 2007; Yun et al., 2008), 'Doonuri' (Yun et al., 2011), 'Tankeumchu' (Noh et al., 2011), and 'Narsha' (Noh et al., 2012).

Availability

In January 2010, 'Hongaram' became a protected, registered new cultivar in Korea (2010-0265). Requests for cuttings for research purposes may be addressed to Jungho Noh (Jeongho89@korea.kr). Vines are available for sale at the Dae-Gyeong Nursery (4-38 Sowol-ri, Wachon-myeon, Gyeongsan-si, Gyeongbuk, South Korea).

Fig. 2. Fruit of 'Hongaram' grape

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