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Ballington et al.

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(54) **RASPBERRY NAMED ‘NANTAHALA’**

(50) Latin Name: ***Rubus idaeus* Linnaeus**
Varietal Denomination: **Nantahala**

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patent is extended or adjusted under 35
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(52) **U.S. Cl.** **Plt./204**

(58) **Field of Classification Search** **Plt./204**
See application file for complete search history.

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(57) **ABSTRACT**

Rubus idaeus Linnaeus ‘Nantahala’ is a new and distinct
variety of raspberry that has the following unique combina-
tion of desirable features that are outstanding in a new variety.

1. Late season ripening to follow ‘Heritage’.
2. Fruit is medium size, 3.5 g.
3. Fruit is firm, very attractive, uniform and conical to
ovate.
4. Consistent and moderate yields.

2 Drawing Sheets

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Latin name of the genus and species: The Latin name of the
novel raspberry variety disclosed herein is *Rubus idaeus* Lin-
naeus.

Variety denomination: The inventive cultivar of *Rubus*
idaeus disclosed herein has been given the variety denomi-
nation ‘Nantahala’.

BACKGROUND OF THE INVENTION

The present invention related to a new and distinct cultivar
of *Rubus idaeus* Linnaeus (raspberry) grown as a fruiting
shrub for commercial agriculture. Raspberries are typically
consumed both fresh and in a number of processed products.

The new and distinct variety of raspberry (*Rubus idaeus*
Linnaeus) originated from the hand pollinated cross of ‘NC
245’ (‘Algonquin’x‘Royalty’) (unpatented)x‘Rossana’ (un-
patented) made in 1994 in Raleigh, N.C. ‘NC 245’ is a pri-
mocane fruiting red raspberry, with moderate vigor, low yield
and poor fruit quality and taste. ‘Rossana’ is a primocane
fruiting red raspberry with superior flavor but has low vigor in
North Carolina climate. The seeds were germinated in the
winter of 1994–1995 and the resulting seedlings were estab-
lished at the Upper Piedmont Research Station in Reidsville,
N.C. (GPS coordinates N36°, W0791’) in the spring of 1995.
When the seedlings had experienced 4 years of growth under
field conditions in 1998, ‘NC451’ was selected for it large and
firm berry and superior fruit flavor. The selection was then
propagated by crown divisions and root cuttings in Raleigh,
N.C. The propagules were planted in replicated trials with
other raspberries at the Mountain Horticultural Research Sta-
tion (GPS N35° W082’) in Fletcher, N.C. and the Upper
Mountain Research Station (GPS N36° W081’) in Laurel
Springs, N.C. Plants and fruit of this new variety have
remained true to type through successive cycles of asexual
propagation. The new variety has been named the ‘Nantahala’
cultivar.

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‘Nantahala’ is adapted to western North Carolina. There
has been no observed winter damage in our tests, therefore
winter hardiness is unknown. Chilling requirement of ‘Nan-
tahala’ is unknown.

SUMMARY OF THE INVENTION

‘Nantahala’ is a new and distinct variety of raspberry for
fresh market production. ‘Nantahala’ berry is larger and
firmer than ‘Heritage’ an industry standard. ‘Nantahala’ rip-
ens later than most primocane fruiting cultivars and is recom-
mended for the mountain regions of North Carolina and adja-
cent states with high elevation. In sensory evaluation panels,
‘Nantahala’ rated as good or better than ‘Caroline’, ‘Heritage’
and a store bought cultivar from California. In the Cherokee
language, ‘Nantahala’ means “land of the midday sun.”

BRIEF DESCRIPTION OF THE DRAWINGS

The photographs were made using digital photography
techniques and illustrate the colors as true as reasonably
possible when using these techniques. Colors in the photo-
graphs may differ slightly from the color values cited in the
detailed botanical description, which accurately describe the
colors of the new *Rubus idaeus* variety. All photographs were
taken from plants grown at the Upper Mountain Research
Station in Laurel Springs, N.C. which was established in
April 2002. Photographs were taken Sep. 26, 2007.

**DETAILED BOTANICAL DESCRIPTION OF THE
VARIETY**

The following is a detailed botanical description of a new
and distinct variety of *Rubus idaeus* Linnaeus know as ‘Nan-
tahala’. The observations below are from mature plants
grown in test plots at a standard spacing of row width of 2 feet
and 10 feet between rows. Those skilled in the art of cultivar
description and evaluation will appreciate that certain char-

acteristics of a variety will vary with older or conversely younger plants, as well as plants grown under different production protocols. ‘Nantahala’ has not been observed under all possible environmental conditions. Where dimensions, sizes, colors and other characteristics are given, it is to be understood that such characteristics are approximations or averages set forth as accurately as possible. The phenotype of the variety may differ from the description herein with variations in the environment such as season, temperature, light intensity, day length and cultural conditions. Color notations are based on The Royal Horticultural Society Colour Chart, The Royal Horticultural Society, London, UK, 2007 edition.

Yield components for ‘Heritage’, ‘Caroline’ (U.S. Plant Pat. No. 10,412) and ‘Nantahala’ can be found in Table 1. For botanical description purposes, ‘Nantahala’ was compared to the earlier ripening ‘Heritage’ a full description can be found in Table 2.

TABLE 1

Yield components of raspberries harvested from Laurel Springs, and Fletcher, NC.				
	Laurel Springs, NC Yield estimate lbs/acre ¹	Laurel Springs, NC Berry Wt (g)	Fletcher, NC Yield estimate lbs/acre ¹	Fletcher, NC Berry Wt (g)
Nantahala	8107	3.5	9253	3.5
Caroline	12306	3.2	12583	2.5
Heritage	NA	NA	10178	2.9

¹Yields based on 3 years of replicated cultivar trials at each location, for a total of 6 years. Yield estimates were calculated using: Yield/cane of 3 canes/plot, * no. canes/plot. Yield estimation model from: Daubeny, H. A., A. Dale, G. McGregor. 1986. Estimating yields of red raspberries in small research plots. HortScience: 21(5): 1216-1217.

The botanical descriptive data presented were collected from mature plants at the Upper Mountain Research Station in Laurel Springs, N.C. in 2006 and 2007. Table 2 provides information on the plant and fruit characteristics of the new cultivar ‘Nantahala’. The new variety is particularly characterized and distinguished from other cultivars by its medium size, conical-ovate shape and attractive firm fruit with moderate, late and consistent yields.

TABLE 2

Plant and fruit characteristics of ‘Nantahala’ and ‘Heritage’.		
	‘Nantahala’	‘Heritage’
<u>General</u>		
Plant size (cm)	151	126
Growth habit	Erect	Erect
Productivity	Low-Medium	Medium
Self-fruitfulness	Self	Self
Time of bud burst (Raleigh NC)	1-Apr	29-Mar
<u>Primocane fruiting</u>		
Percent of cane length flowering as primocane	25	30
Percent of total yield	90	85
Number of fruiting nodes Primocanes	9-11	14-15
<u>Young shoots</u>		
Number of young shoots/ft ²	12	8
Length (cm)	151	126
Cane diameter at 15 cm from ground (cm)	8.1	7.6
Cane diameter at 50 cm from ground (cm)	7.5	6.8

TABLE 2-continued

Plant and fruit characteristics of ‘Nantahala’ and ‘Heritage’.			
	‘Nantahala’	‘Heritage’	
5	Height: diameter at 15 cm from ground	19.1	16.5
	Height: Diameter at 50 cm from ground	20.9	18.8
10	Time of shoot emergence	3-Apr	31-Mar
	Glaucosity (waxy bloom)	Weak	Weak
	Cane cross section from mid cane of primocane	Round	Round
	Dormant cane color	167C	183B
	<u>Prickles</u>		
15	Pigmentation	183A	178A
	Density on young shoots	Moderate	Dense
	Attitude of tip	Straight	Down
	Texture	Smooth	Rigid
	Presence and distribution on petioles	Present and irregular	Present and irregular
20	Pubescence on canes	Absent	Absent
	Internodal distance (cm) at central 1/3 of cane	2.3	3.2
	Density per 1 cm cane at 15 cm from ground	17	17
	Density per 1 cm cane at 50 cm from ground	5	6
25	<u>LEAVES</u>		
	Face color	137A	137A
	Relief between veins	Weak	Very weak
	Glossiness	Medium	Medium
30	Underside color	148B	148B
	Petiole Length (cm)	4.9	5.9
	Stipule orientation	Erect	Erect
	Arrangement	Compound	Compound
	Number of leaflets	3, 5 sometimes	3, 5 sometimes
	Overlapping of lateral leaflets	Free to touching	Free to touching
35	Lateral leaflet: length of stalklet	Very short	Very Short
	<u>Terminal leaflet</u>		
	Length (cm)	13.5	16.5
	Width (cm)	15	17.9
	Shape	Ovate	Ovate
40	Tip	Acuminate	Acuminate
	Margin	Double serrate	Double serrate
	<u>Lateral leaflets (basal pair)</u>		
	Length (mm)	87	92
	Width	57	54
	Overlap	Touching	Touching
45	Orientation	Opposite	Opposite
	Shape	Ovate	Ovate
	Tip	Acuminate	Acuminate
	Base	Acute to rounded	Acute to rounded
	Margin	Double serrate	Double serrate
50	<u>FLOWERS</u>		
	<u>Flowering period</u>		
	Primocane	Aug. 15-Sep. 15	Aug. 1-Sep. 1
	Florican	Not harvested	Not harvested
	Flower diameter (mm)	18	17
55	Fragrance	No distinguishing fragrance was noted	No distinguishing fragrance was noted
	<u>Petal</u>		
	Length	6.3	6.3
	Width	2.7	2.7
60	<u>FRUIT</u>		
	<u>Harvest season</u>		
	Primocane	9/15 to frost	9/1 to frost
	Florican	Unknown	Unknown
65	Number of fruiting laterals	8	12

TABLE 2-continued

Plant and fruit characteristics of 'Nantahala' and 'Heritage'.		
	'Nantahala'	'Heritage'
Length (4 th lateral from tip) (cm)	9	7
Number of fruit per lateral	6	8
<u>Color</u>		
Immature	47B	42B
Maturing	46A	46A
Mature fruit	59A	59A
Glossiness	Medium	Medium
Shape	Conical-ovate	Ovate
<u>Dimensions</u>		
Length (mm)	21	17
Width (mm)	19.8	15
Length: width	1.06	1.13
Weight (g/fruit)	3.5	2.9
Soluble solids	10.8	9
Seed weight (g)	0.002	0.008
Number of drupelets/fruit	70	100
Adherence to plug	Medium	Medium
Firmness	Medium to Firm	Medium
Yield	Low to medium	Medium

Sensory Evaluation of Nantahala and 4 other red raspberries, 'Caroline', "California" (bought off the shelf), and 'Heritage' were conducted at the NCSU Dept. Food Science in 2006 (Table 3). 'Nantahala' scored as good or better than other cultivars in overall liking, appearance (shape and color), flavor, texture and seediness.

TABLE 3

Sensory Evaluation of 'Nantahala' and three other primocane fruiting red raspberries ¹ .							
Question Title	Attribute	Nantahala	Caroline	"California"	Heritage		
Overall Liking	Overall	6.39	a*	5.68	a	5.77	a 5.84 a
10 Appearance Liking	Red Color	7.39	a	6.56	bc	6.53	bc 5.89 c
15 Appearance Liking	Shape	7.23	a	6.05	c	7.14	a 6.26 bc
15 Flavor Liking	Flavor	6.07	a	5.7	a	5.61	a 5.49 a
15 Texture Liking I	Firmness	6.16	a	4.88	b	6.49	a 5.81 a
15 Texture Liking I	Juiciness	6.67	ab	5.93	b	6.04	ab 6.16 ab
20 Seediness/ Fuzziness	Seediness	2.96	a	2.54	b	2.49	b 2.74 ab
20 Seediness/ Fuzziness	Fuzziness	2.18	b	2.07	b	2.79	a 2.32 b

*Means in a row followed by different letters are significantly different at the p < 0.05 level
¹Sensory Evaluation Method (NCSU Dept. Food Science)
 Consumers scored all products for overall acceptability, red color, shape, flavor, firmness, juiciness, seediness and fuzziness on a 9-point hedonic scale where 9 = like extremely and 1 = dislike extremely.

That which is claimed is:

1. A new and distinct variety of commercial red raspberry plant (*Rubus idaeus* Linnaeus) substantially as illustrated and described, characterized by its medium size conical-ovate shaped and attractive firm fruit, with moderate, late and consistent yields.

* * * * *

Fig. 1 shows typical fruit of 'Nantahala'.

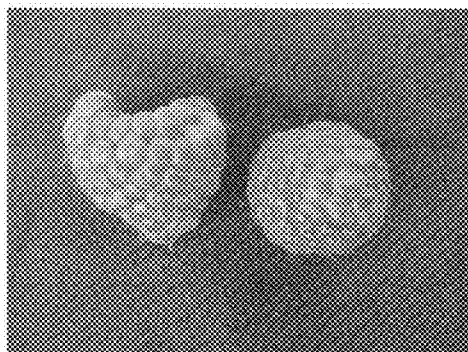


Fig. 2 shows the typical fruit of 'Nantahala' compared to 'Heritage'.



Fig. 3a and b. Shows abaxial (lower) and adaxial (upper) surfaces of primocane leaves of 'Nantahala' raspberry.

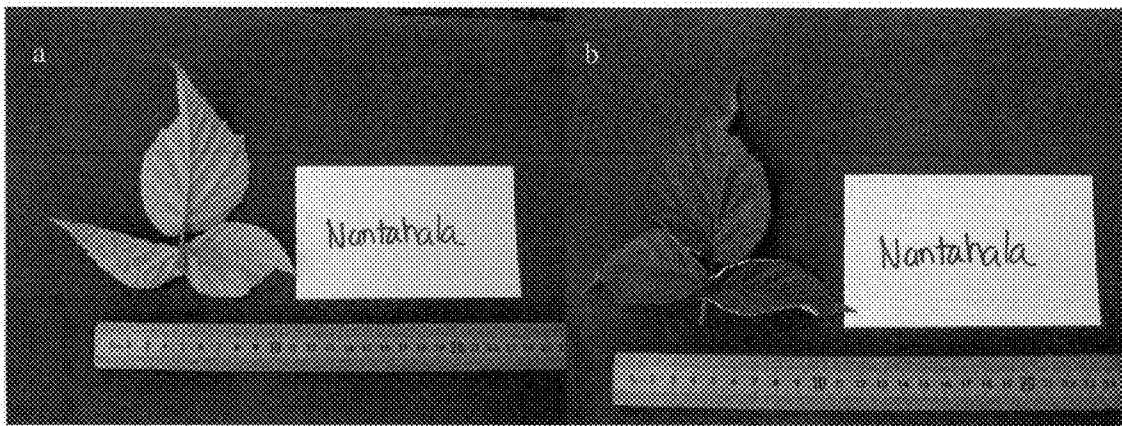


Fig. 4a and b. Shows abaxial (lower) and adaxial (upper) surfaces of primocane leaves of 'Heritage' raspberry.

