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(54) **WINTERBERRY HOLLY PLANT NAMED 'NCIV1'**

(50) Latin Name: ***Ilex verticillata***
Varietal Denomination: **NCIV1**

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A01H 5/08 (2006.01)

(52) **U.S. Cl.**
USPC **Plt./247**

(58) **Field of Classification Search**
USPC Plt./247, 226
See application file for complete search history.

(56) **References Cited**

PUBLICATIONS

Flowering Shrubs Spring Meadow Nursery, Inc. Starter Plants Catalog and Shrub Reference 2013-2014, pp. 1-12, 57 and 91-93.*
Flowering Shrubs, Spring Meadow Nursery, Inc. Starter Plants Catalog and Shrub Reference 2013-2014; Aug. 25, 2013, pp. 57 (Little Goblin/ 'NCIV1').

* cited by examiner

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(57) **ABSTRACT**

'NCIV1' is a new cultivar of hybrid holly with a compact, roughly rounded growth habit, and prolific, large, showy red fruit.

2 Drawing Sheets

Latin name of the genus and species: The Latin name of the novel plant variety disclosed herein is *Ilex verticillata.*

Variety denomination: The inventive seedling selection of *Ilex verticillata* disclosed herein has been given the varietal denomination 'NCIV1'.

BACKGROUND OF THE INVENTION

The present invention comprises a new and distinct winterberry holly cultivar hereinafter referred to by the cultivar name 'NCIV1'. This new holly was developed at North Carolina State University, Mills River, N.C. 'NCIV1' was selected from a population of seedlings grown from an open-pollinated selection of *Ilex verticillata* (NCSU 1998-538, unpatented, parentage unknown). 'NCIV1' was selected based on its compact form and prolific, large, red, showy fruit. DNA content of 'NCIV1' was determined using flow cytometry and found to be approximately twice that of *I. verticillata* 'Winter Red' indicating that 'NCIV1' is a natural tetraploid.

The first asexual propagation of 'NCIV1' was carried out in July 2008 by rooting stem cuttings in Mills River, N.C. Since then 'NCIV1' has been asexually reproduced repeatedly by vegetative cuttings over a 6 year period. 'NCIV1' roots readily from softwood cuttings treated with a basal dip of 2,500-5,000 ppm indole butyric acid (potassium salt) in water. 'NCIV1' has been found to retain its distinctive characteristics through successive asexual propagations.

SUMMARY OF THE INVENTION

The following are the unique combination of characteristics of this new cultivar when grown under standard horticultural practices in Mills River, N.C.

1. Compact habit and small stature.
2. Prolific, large, red fruit.
3. 2C DNA content of approximately 4.38 pg indicating it is a tetraploid cytotype.

BRIEF DESCRIPTION OF THE DRAWINGS

This new holly is illustrated by the accompanying photographs which show the plant's form, and fruit characteristics. The colors shown are as true as can be reasonably obtained by conventional photographic procedures. Colors in the photographs may differ slightly from the color values cited in the detailed botanical description, which accurately describe the colors of the new hybrid holly.

FIG. **1** is a color photograph showing the form and fruit of 'NCIV1' in early winter 2013 on a nine-year-old plant.

FIG. **2** is a color photograph showing the fruit of 'NCIV1' in early winter 2013 on a nine-year-old plant.

DETAILED BOTANICAL DESCRIPTION

The following is a detailed description of the botanical characteristics of the new and distinct hybrid holly variety known by the denomination 'NCIV1'. The detailed description was taken on a nine-year-old field-grown plant in Mills River, N.C. in 2013. All colors cited herein refer to The Royal Horticultural Society Colour Chart (The Royal Horticultural Society (R.H.S.), London, 2001 Edition). Where specific 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 practicable.

Technical Description of the Variety

Classification:

Botanical name.—*Ilex verticillata* 'NCIV1'.
Common name.—Winterberry holly.

Parentage: Seedling grown from an open-pollinated selection of *Ilex verticillata*, NCSU 1998-538 (unpatented).

Plant description:

Growth habit.—Deciduous shrub. Compact, rounded/oval in shape.

Height.—About 100 cm after nine years.

Width.—About 100 cm after nine years.

Shoot and stem:

Mature stem texture.—Finely pubescent, with lenticels.

Mature stem color.—Brown (N200B) with brown (N200D) lenticels.

Lateral branches:

Length.—About 13 cm.

Diameter.—About 2 mm.

Internode length.—About 1.5 cm.

Strength.—Strong.

Texture.—Smooth, glabrous.

Color.—Immature: Green (138A). Mature: Grayed-green (198A).

Lenticels.—Length: About 1 mm. Diameter: About 1 mm. Color: Grey-brown (199C) to grey-brown (199D).

Roots: Fibrous, freely branching.

Leaves:

Arrangement.—Alternate, single.

Length.—Avg. 4.0 cm (2.8 to 5.1 cm).

Width.—Avg. 1.8 cm (1.2 to 2.5 cm).

Shape.—Elliptic.

Apex.—Apiculate.

Base.—Attenuate.

Margin.—Serrulate.

Venation pattern.—Pinnate.

Texture.—Upper Surface: Smooth, glabrous. Lower Surface: Pubescent, slightly rugose.

Emerging leaves.—Color: Upper: Green (137A). Lower: Yellow-green (144A).

Mature leaves during growing season.—Color: Upper: Green (137A). Lower: Green (143A).

Venation.—Upper Surface: Green (137A). Lower Surface: Yellow-green (145C).

Petiole.—Length: Avg. 0.77 cm (0.3 to 1.2 cm). Diameter: Avg. 0.74 mm (0.6 to 1.1 mm). Texture: Upper: Glabrous. Lower: Glabrous. Color: Upper: Yellow-green (145C). Lower: Yellow-green (145C).

Inflorescence:

Description.—Small axillary cup-shaped flowers, solitary or in clusters. Flowers face upright to outward. Flowers not persistent.

Number of true flowers per inflorescence.—1 to 3.

Flowering season.—Summer; June and July in Mills River, N.C.

Fragrance.—None detected.

Bud.—Shape: Globular. Length: About 2 mm. Diameter: About 2 mm. Color: Green-white (157A).

Petal.—Arrangement: Whorl. Number: 7. Fused or not fused: Not fused. Texture: Smooth. Shape: Oblong. Margin: Entire. Apex: Rounded. Base: Attenuate. Length: About 3 mm. Width: About 1.5 mm. Texture: Upper: Smooth, glabrous. Lower: Smooth, glabrous. Color when opening: Upper: White (157B). Lower: White (157A). Color at anthesis: Upper: Green-white (157B). Lower: Green-white (157A).

Sepal.—Quantity per flower: 7. Length: About 1.5 mm. Width: About 1 mm. Shape: Deltoid. Apex: Acute. Base: Fused. Margin: Entire. Texture: Upper: Smooth, glabrous. Lower: Smooth, glabrous. Color: Upper: Yellow-green (144A). Lower: Yellow-green (144A).

Peduncle.—Length: About 2 mm. Diameter: About 0.8 mm. Orientation: About 20 to 40 degrees from vertical. Strength: Strong. Color: Yellow-green (144A).

Pollination requirement: Functional female (dioecious). Needs a male pollinator that blooms at the same time for pollination.

Reproductive traits:

Sex.—Functional female (dioecious).

Gynoecium.—Pistil number: 1. Pistil length: About 5 mm. Stigma shape: Oblong. Stigma color: Yellow-green (144A). Ovary shape: Oval. Ovary color: Green (143A).

Androcoecium.—Stamen number: 7. Anther shape: Narrowly deltoid. Anther attachment: Basifixed. Anther size: About 0.8 mm. Anther color: Green-white (157D). Amount of pollen: None observed.

Fruit and seed.—Fruit type: Drupe. Fruit texture: Smooth, glabrous. Fruit quantity per flower: 1. Fruit shape: Spherical, somewhat flattened. Fruit diameter: Avg. 10 mm (8 to 12 mm). Fruit color: Immature: Yellow-Green (145A). Mature: Red (44A/B). Days to ripening: About 75. Longevity on plant: More than 2 weeks. Seed number: About 7. Seed length: Avg. 1.8 mm (1.7 to 1.9 mm). Seed diameter: Avg. 1.3 mm (1.1 to 1.4 mm). Seed Texture: Smooth, glabrous. Seed color: Yellow-Green (152C).

DNA content: 2C DNA contend was determined following the methods of Shearer and Ranney (2013) using 4',6-diamidino-2-phenylindole (DAPI) fluorochrome stain and *Pisum sativum* 'Ctirad' as an internal standard with 3 replications. Mean 2C DNA content for 'NCIV1' was 4.38±0.03 (SEM), approximately twice the value of *I. verticillata* 'Winter Red' with a DNA content of 1.93±0.05 (SEM) indicating that 'NCIV1' is a tetraploid.

Disease and insect resistance: No significant disease or insect pests have been observed.

Cold hardiness: At least USDA zone 5; testing has not been completed in colder zones.

Comparison to parent 'NCSU 1998-538': 'NCIV1' is more compact (about 40 in.×40 in.), while 'NCSU 1998-538' is larger (about 50 in.×50 in.). 'NCIV1' has darker red fruit (44A/B), while 'NCSU 1998-538' is more reddish-orange (40C). 'NCIV1' also has larger fruit (about 10 mm in diameter) as compared to the smaller fruit of 'NCSU 1998-538' (about 8 mm in diameter).

COMPARISON WITH COMMERCIAL CULTIVARS

Table 1 shows comparison of distinguishing characteristics between *Ilex verticillata* 'NCIV1' and the commercial cultivar 'Winter Red' (U.S. Plant Pat. No. 4,146). 'NCIV1' is

distinguished from *Ilex verticillata* 'Winter Red' by having twice the genomic DNA content indicating it is a tetraploid and having a smaller, compact stature, and larger diameter fruit.

TABLE 1

Comparison of *Ilex verticillata* 'NCIV1' with 'Winter Red'.

Trait	Taxa: *Ilex verticillata* 'Winter Red'	Taxa: *Ilex verticillata* 'NCIV1'
Plant height & diameter	About 96 in. × 96 in.	About 40 in. × 40 in.
Plant habit	Erect, rounded shape	Compact, roughly rounded shape
Fruit diameter (mm)	Mean: 6 Range: 4 to 8	Mean: 10 Range: 8 to 12

TABLE 1-continued

Comparison of *Ilex verticillata* 'NCIV1' with 'Winter Red'.

Trait	Taxa: *Ilex verticillata* 'Winter Red'	Taxa: *Ilex verticillata* 'NCIV1'
DNA content (pg) mean ± SEM	1.93 ± 0.05	4.38 ± 0.03
Estimated ploidy level	Diploid	Tetraploid

Citations:

Shearer, K. and T. G. Ranney. 2013. Ploidy levels and relative genome sizes of species, hybrids, and cultivars of dogwood (*Corunus* spp.). HortScience 48(7):825-830.

What is claimed is:

1. A new and distinct hybrid holly plant named 'NCIV1' substantially as illustrated and described herein.

* * * * *

Fig. 1

Fig. 2