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Ash et al.

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(54) **PISTACHIO ROOTSTOCK NAMED**
‘UCB1-D71’

(50) Latin Name: *Pistacia atlantica*×*Pistacia integerrima*
Varietal Denomination: **UCB1-D71**

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(58) **Field of Classification Search**
USPC **Plt./152**
See application file for complete search history.

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(57) **ABSTRACT**

Disclosed is a new and distinct variety of pistachio rootstock called ‘UCB1-D71’ characterized in that, when compared to the industry standard ‘UCB1-D1’ rootstock, it has greater growth and tolerance to the soil salts of calcium chloride, sodium sulfate, sodium carbonate and sodium bicarbonate; greater growth and tolerance to high levels of dissolved salts in irrigation water; and earlier vegetative bud break.

2 Drawing Sheets

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Latin name: *Pistacia atlantica*×*Pistacia integerrima*.
Varietal denomination: ‘UCB1-D71’.

CROSS-REFERENCES TO RELATED APPLICATIONS

The present variety was developed as part of a breeding program which produced the following pistachio rootstocks ‘UCB1-D90’ (Ser. No. 14/756,672), ‘UCB1-D110’ (Ser. No. 14/756,675), and ‘UCB1-D154’ (Ser. No. 14/756,676).

BACKGROUND OF THE NEW VARIETY

The present invention comprises a new and distinct cultivar of hybrid pistachio (*Pistacia atlantica* (not patented)×*Pistacia integerrima* (not patented) used as a rootstock known by the varietal name ‘UCB1-D71’. The variety ‘UCB1-D71’, is an in vitro, single selection of the segregating controlled cross of (*P. atlantica*×*P. integerrima*) made at Davis, Calif. The purpose of the selection program was to develop rootstocks with superior tolerance to soil salts. Seedlings were tested in salt trials in the laboratory and compared to the ‘UCB1-D1’ (not patented) rootstock. Those seedlings that exhibited high tolerance to various soil salts were selected. The new variety exhibits high tolerance to numerous, common salts found in the soil and irrigation

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water. The present variety has higher resistance to *Verticillium* disease than the female parent, *Pistacia atlantica*; and has higher cold tolerance than the male parent, *Pistacia integerrima*.

5 The following characteristics distinguish clone ‘UCB1-D71’ from the industry standard, ‘UCB1-D1’ (not patented) rootstock:

- 1. Greater growth and tolerance to the soil salts, calcium chloride, sodium sulfate, sodium carbonate and sodium bicarbonate.
- 10 2. Greater growth and tolerance to high levels of dissolved salts in irrigation water.
- 3. Earlier vegetative bud break.
- 15 4. The present variety differs from rootstocks UCB1-D90, UCB1-D110, and UCB1-D154 in that the present variety is more tolerant to the soil salt sodium carbonate than the other three varieties.

ORIGIN AND ASEXUAL REPRODUCTION OF THE NEW VARIETY

25 Asexual reproduction of the new and distinct variety of rootstock was accomplished by germinating seed in vitro under aseptic conditions and propagating the resulting seedlings using micropropagation techniques. Shoot epicotyl and

hypocotyl tissue was collected from germinating seedlings and placed on a standard growth media to produce shoots. The shoots were sub-cultured and multiplied until desired numbers were obtained and then transferred to standard rooting media for rooting. Rooted plantlets were then transferred to a peat:perlite media in acclimation chambers under 100% humidity. Field environmental parameters were gradually introduced to harden plantlets which were then successively transferred to larger pots in the greenhouse as their size increased. These potted trees were used to establish field performance trials. Subsequent evaluations have shown those asexual reproductions are true-to-type to the original rootstock selection. All characteristics of the original tree were established and appear to be transmitted completely through succeeding asexual propagations.

SUMMARY OF THE NEW VARIETY

The 'UCB1-D71' rootstock of the present invention is characterized by its tolerance to high levels of the soil salts of calcium chloride, sodium sulfate, sodium carbonate and sodium bicarbonate. In each case 'UCB1-D71' had greater growth in laboratory salt trials than the industry standard rootstock, 'UCB1-D1' (not patented). In another laboratory salt trial, media was supplemented with the total salt load detected in saline San Joaquin Valley irrigation water and also supplemented with twice that load. In all cases, growth of 'UCB1-D71' outperformed that of 'UCB1-D1' (not patented) in the presence of high soluble salts. In addition, vegetative bud break of 'UCB1-D71' was observed to be approximately 3 days earlier than 'UCB1-D1' (not patented).

DESCRIPTION OF THE ILLUSTRATIONS

The accompanying photographic illustrations show typical specimens of vegetative growth of the new variety, with the color being as nearly true as is possible with color illustrations of this type:

FIG. 1 shows a 4 year old pistachio tree of the new variety.

FIG. 2 shows a close-up of the mature leaves of the new variety.

DESCRIPTION OF THE NEW VARIETY

The following detailed description sets forth the characteristics of the new variety. The data which defines these characteristics was collected under natural daylight on plants grown in the central valley of California in Stanislaus County in the greenhouse and in the field. Descriptions may vary in slight detail due to climatic, soil and cultural conditions under which the variety may be grown. Color designations are presented with reference to the Inter-Society Color Council, National Bureau of Standards, except where common color names are also included.

Tree:

Trunk circumference.—At a height of 1 foot is 28.5 cm.

Trunk lenticels.—Are approximately 3.2 mm in length and 1.2 mm in width. Trunk lenticels are linear in shape. Trunk lenticel color is strong brown [55. s.B]. Trunk lenticels number approximately 28 per square inch.

Bark color.—Is dark grayish yellow [91. d.g.Y].

Branch lenticels.—Are approximately 2.0 mm in length and 0.9 mm in width. Branch lenticels are elliptic in shape. Branch lenticel color is strong

brown [55. s.B]. Branch lenticels number approximately 46 per square inch.

Vegetative buds:

Size.—Approximately 52 mm in length and 7 mm in width.

Shape.—Conical.

Color.—Brilliant, yellowish green [130. b.y.G] with strong, orange yellow [68. s.OY] exterior basal scales. As tips unfurl they become strong purplish red [255. s.p.R]. First vegetative buds of 'UCB1-D71' opened approximately 3 days earlier than 'UCB1-D1' (not patented).

Leaflet blade color.—On the top and bottom surfaces is vivid red [11. v.R]. At the junction of the base of the petiole with the rachis, tissue color is brilliant, yellowish green [130. b.y.G].

Expanding rachis color.—Is brilliant, yellowish green [130. b.y.G] at the extreme tip and very dark purplish red [260. v.d.p.R] on all sides elsewhere.

Leaf venation pattern.—Is pinnate and alternate. Midrib and veins are brilliant, yellowish green [130. b.y.G].

Foliage:

Leaves.—Are pinnately compound composed of alternate leaflets numbering between 15 and 20.

Compound leaf size.—Variations are great but average approximately 72 cm in length and 49 cm in width at the widest point.

Young leaflets.—Are glossy and dark greyish red [20. d.g.R] on upper surfaces and moderate olive green [125. m.OG] on lower surfaces. Older leaflet surfaces are strong olive green [123. s.OG] on upper surfaces and moderate olive green [125. m.OG] on lower surfaces.

Leaflet shape.—Is lanceolate with an acute apex and cuneate base. There is great variation in leaf and leaflet size depending on the time of the season, position on the tree and tree age. Leaflet size varies considerably but averages 80 mm in length and 27 mm in width.

Leaflet venation pattern.—Is pinnate and venation is brilliant yellowish green [130. b.y.G]. The midrib is prominent and the same color as the venation pattern.

Leaflet margins.—Are entire and surfaces are glabrous.

Petiole and rachis.—Younger tissue upper and lower surface color is predominately strong purplish red [255. s.p.R] with some strong yellowish green [131. s.y.G] streaking on lower surfaces of older tissues.

Petiole length.—Varies considerably but averages 49 mm in length from point of rachis attachment to basal leaflet, and is glabrous with no wings.

Rachis length.—Varies considerably and averages about 51 cm in length.

Salt tolerance:

Different concentrations of individual salts that contribute to soil salinity and alkalinity ranging from 0 to 10,000 mg/l were added to the culture medium that rootstock was growing in. Each clone-salt combination was replicated four times. Observations were taken on visual injury symptoms and growth measured by number of shoots and leaves per plant. 'UCB1-D71' rootstock is characterized by its tolerance to high levels of the soil salts, calcium chloride (at 10,000 mg/l), sodium sulfate (at 10,000 mg/l),

sodium carbonate (at 1,000 mg/l) and sodium bicarbonate (at 1,000 mg/l). As measured on a growth scale of 1 to 10, in the case of each of these salt trials clone 'UCB1-71D' had greater growth than the industry standard rootstock, 'UCB1-D1' (not patented). In another salt trial, media was supplemented with the comparable total salt load detected in saline San Joaquin Valley irrigation water (Sanden, B. et al. 2009. Large-Scale Utilization of Saline Groundwater for Irrigation of Pistachios Interplanted with Cotton. 2009 Progress Rpt. of CA Pistachio Comm.) plus twice the detected salt load. In all cases, growth of

'UCB1-D71' outperformed that of 'UCB1-D1' (not patented) in the presence of high soluble salts.

Disease/cold tolerance:

The present variety.—Has higher resistance to *Verticillium* disease than the female parent, *Pistacia atlantica*.

The present variety.—Has higher cold tolerance than the male parent, *Pistacia integerrima*.

The invention claimed is:

1. A new and distinct variety of pistachio rootstock plant substantially as herein described and illustrated.

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FIG. 1



FIG. 2