



US00PP13098P2

(12) **United States Plant Patent**  
**Windham et al.**

(10) **Patent No.: US PP13,098 P2**  
(45) **Date of Patent: Oct. 22, 2002**

- (54) **DOGWOOD TREE NAMED 'KAY'S APPALACHIAN MIST'**
- (75) Inventors: **Mark T. Windham; Robert N. Trigiano; Willard T. Witte**, all of Knoxville, TN (US)
- (73) Assignee: **University of Tennessee Research Corporation**, Knoxville, TN (US)
- (\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/655,512**  
(22) Filed: **Sep. 5, 2000**

**Related U.S. Application Data**

- (60) Provisional application No. 60/210,603, filed on Jun. 9, 2000.
- (51) **Int. Cl.<sup>7</sup>** ..... **A01H 5/00**
- (52) **U.S. Cl.** ..... **Plt./220**
- (58) **Field of Search** ..... **Plt./220**

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

PP8,500 P	12/1993	Smith
PP10,166 P	12/1997	Nicholson
PP10,423 P	6/1998	Stanley
PP11,654 P	11/2000	Asako
2002/0035742 A1	3/2002	Windham et al.

**OTHER PUBLICATIONS**

Windham, M.T., et al.; "Reactions of Cornus Species to Powdery Mildew," SNA Research Conference, vol. 42, pp. 227-229 (42<sup>nd</sup> Annual Report, 1997).

Trigiano, R.N., et al.; "Three New Cultivars of Flowering Dogwood Resistant to Powdery Mildew", *HortScience*, vol. 35(3), p. 490 (June 2000).

Gary, L.B., "Appalachian Spring: New UT Cultivar is First to Resist Deadly Dogwood Disease," *UT Agriculture Magazine* (Spring 1999).

Caetano-Anolles, G., et al., "DNA amplification fingerprinting and marker screening for pseudo-testcross mapping of flowering dogwood (*Cornus florida* L.)", *Euphytica*, 1999, 106:209-222 Pub.: Kluwer Academic Publishers, Netherlands.

Gary, L.B., "Appalachian Spring: New UT Cultivar is First to Resist Deadly Dogwood Disease," *UT Ag. Magazine*, Spring 1999, XP-002194700, Pub: Univ. of Tenn. Online.

Hagan, A.K., et al., "Susceptibility of Cultivars of Several Dogwood Taxa to Powdery Mildew and Spot Anthracnose", *J. Environ. Hort.*, 1998, 16(3):147-151, Pub: unknown.

Hanson, S., "Dogwood: Current and Future Research", 2000, XP-002194703 [online].

Hollins, S.J., et al., "Breeding Disease Resistant Flowering Dogwood (*Cornus florida*)", *SNA Research Conference*, 1999, 44:359-361 [online].

Ragland, C., "Dogwood Tree", *Dogwood, Microsoft® Encarta® Online Encyclopedia* 2000, XP-002194704, Pub: Microsoft Corporation.

Trigiano, R.N., et al., "Teaching Methods: Laboratory Exercises on DNA Amplification Fingerprinting for Evaluating the Molecular Diversity of Horticultural Species," *Hor Technology*, 1998, 8(3):413-23, XP-001064538, Pub: Unknown.

Trigiano, R.N., et al., "Three New Cultivars of Flowering Dogwood Resistant to Powdery Mildew," *Hort. Science*, 2000, 35(3):490, #549, XP-001064539, Pub: Unknown.

Unknown, "Powdery Mildew of Flowering Dogwood", 2000, XP-002194701 [online], Pub: The University of Tennessee Dogwood Research Group.

Windham, M.T., et al., "Are 'Barton' and 'Cloud 9' the Same Cultivar of *Cornus florida* L. ?", *J. Environ. Hort.*, 1998, 16(3):163-166, XP-001064563, Pub: unknown.

Windham, M.T., et al., "Development of Flowering Dogwood Cultivars Resistant to Powdery Mildew", *Tenth Conference of Metropolitan Tree Improvement Alliance (Sep.-Oct. 1998)*, XP-002194702 [online].

Windham, M.T., et al., "Naturally Occurring Resistance to Powdery Mildew in Seedlings of *Cornus florida*", *J. Environ. Hort.*, 1998, 16(3):173-175, XP-001064535, Pub: unknown.

Windham, M.T., et al., "New Dogwood Cultivars Resistant to Powdery Mildew", *SNA Research Conference*, 2000, 45:204-205, XP-002194698 [online].

*Primary Examiner*—Bruce R. Campell  
*Assistant Examiner*—June Hwu  
(74) *Attorney, Agent, or Firm*—Saliwanchik, Lloyd & Saliwanchik

(57) **ABSTRACT**

A new and distinct cultivar of Dogwood tree, *Cornus florida*, named 'Kay's Appalachian Mist', is provided. This cultivar is characterized by resistance to powdery mildew which is superior to any other white flowering dogwood.

**4 Drawing Sheets**

**CROSS-REFERENCE TO A RELATED APPLICATION**

This application claims the benefit of U.S. Provisional Application No. 60/210,603, filed Jun. 9, 2000.

**BACKGROUND OF THE INVENTION**

The present invention relates to a new and distinct cultivar of flowering dogwood which is resistant to powdery mildew. This dogwood is botanically known as *Cornus florida* and

hereinafter is referred to by the cultivar name 'Kay's Appalachian Mist'.

This new dogwood cultivar was discovered in a field planting of approximately 980,000 *Cornus florida* seeds in Decherd, Tenn. in 1995. 'Kay's Appalachian Mist' is a white flowering dogwood which, to the knowledge of the inventors, is superior to any other white flowering dogwood cultivar with respect to powdery mildew resistance. Asexual reproduction of 'Kay's Appalachian Mist' by terminal cuttings rooted at the Tennessee Agricultural Experiment Station in Knoxville, Tenn. has shown that the unique features



of this new dogwood cultivar are stable and reproduced true to type in successive vegetative generations.

#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1. Photograph of a typical flower specimen of 'Kay's Appalachian Mist'. This photograph is a closeup view of a typical flower of this cultivar.

FIG. 2. A similarity index for various dogwoods.

FIG. 3. Cluster analysis of various dogwoods.

FIG. 4. Principal coordinate analysis of the relationships between the dogwoods.

Flower colors in the photograph may differ from the actual colors due to light reflectance.

#### DETAILED DESCRIPTION OF THE NEW VARIETY

The parental lineage of this cultivar is unknown. 'Kay's Appalachian Mist' is a white flowering dogwood cultivar isolated from a field planting of approximately 980,000 *Cornus florida* seeds in Decherd, Tenn. Seeds were bulked from collections of wild and landscape trees from Tennessee, North Carolina, Alabama, and Georgia. This cultivar may be reproduced asexually by rooting cuttings and by grafting.

'Kay's Appalachian Mist' has creamy white bracts which slightly overlap. Average bract size is about 13.7 cm long by about 12.0 cm wide (n=14). Clefts at the ends of the bracts are flat and deeply pigmented. Flower petals are yellow and flowers average 22 per inflorescence (n=14).

'Kay's Appalachian Mist' is, to the knowledge of the inventors, superior in resistance to powdery mildew to any other white flowering dogwood cultivar. This cultivar has been tested for three (3) years. Test plants were exposed to powdery mildew and assessed for resistance to powdery mildew. Mildew scores for 'Kay's Appalachian Mist', control plants, and 'Cherokee Brave' were obtained using the following scale: 0=healthy; 1= $\leq$ 2% of foliage with signs or symptoms of powdery mildew; 2= $\leq$ 10% of foliage with signs or symptoms of powdery mildew; 3= $\leq$ 25% of foliage with signs or symptoms of powdery mildew; 4= $\leq$ 50% of foliage with signs or symptoms of powdery mildew; 5= $\leq$ 75% of foliage with signs or symptoms of powdery mildew; 6= $\leq$ 100% of foliage with signs or symptoms of powdery mildew. Table 1 presents the data obtained over the last three (3) years.

Year	'Kay's Appalachian Mist'	Control Score <sup>1</sup>	'Cherokee Brave' <sup>2</sup>
1996	0.0	5.0(a)	—
1997	0.0	4.6(b)	2.3
1998	0.0	4.8(b)	2.1

<sup>1</sup>Control plants were (a) *Cornus florida* seedlings or (b) 'Cherokee Sunset' that were of similar age and size.

<sup>2</sup>'Cherokee Brave' is a pink flowering dogwood cultivar which is the only cultivar known to the inventors to possess resistance to powdery mildew.

DNA amplification fingerprinting was used to type 'Jean's Appalachian Snow', 'Kay's Appalachian Mist', and 'Karen's Appalachian Blush'. The methodology followed that of Trigiano and Caetano-Anollés (HortTechnology, 8:413–423 [1998]). Data, obtained from 235 loci generated from genomic DNA using seven (7) arbitrary octomeric primers, was used to compare the powdery mildew resistant dogwoods of the subject application to other dogwoods (including powdery mildew resistant lines and cultivars

commonly found in nurseries). The sequences of the primers were as follows: 1) GAGCCTGT, 2) GTTACGCC, 3) CCTGTGAG, 4) GTAACGCC, 5) GACGTAGG, 6) GATCGCAG, and 7) GTATCGCC. DNA amplification fingerprinting analysis as well as the cluster and principal coordinate analysis were completed using the NTSYS PROGRAM, pc version 2.2 (Exeter Software, 100 N. Country Road, Sedtauket, N.Y. 11733). A similarity index is provided in FIG. 2. FIG. 3 depicts the resulting cluster analysis. FIG. 4 depicts the principal coordinate analysis of the relationships between the dogwoods.

The abbreviations found in the Figures are as follows: AS='Appalachian Spring', KAM='Kay's Appalachian Mist', JAS='Jean's Appalachian Snow', C9='Cloud Nine', KAB='Karen's Appalachian Blush', CP='Cherokee Princess', SPR='Springtime' and CB='Cherokee Brave'. All are white bract dogwoods except CB, which is red.

#### DETAILED BOTANICAL DESCRIPTION

The following observations, measurements, and comparisons describe this cultivar grown in Knoxville, Tenn. under container nursery conditions which approximate commercial production conditions. Dogwoods used for this description were about five (5) years old and were grown in twenty-five (25) gallon containers. Plant hardiness is expected to be zones 5–9.

The following description uses color references to The Royal Horticultural Society Colour Chart, except where general terms of ordinary dictionary significance are used. All color ratings were on adaxial surfaces. Color ratings for abaxial surfaces were not obtained because reflected/refracted light, due to the density of pubescence on abaxial surfaces, made accurate color determinations difficult or impossible. Measurements are provided as a range with the middle value providing the average (lower limit<average value<upper limit).

Botanical classification: *Cornus florida*, cultivar 'Kay's Appalachian Mist'.

Parentage: Unknown.

Propagation:

*Type*.—Terminal softwood cuttings.

*Time to initiate roots (in June)*.—About 3–4 weeks at about 25–30° C.

*Rooting habit*.—Profuse from base of cutting.

*Rooting hormone*.—5,000–10,000 ppm; five (5) second quick dip of DIP 'N' GROW (1% IBA, 0.5% NAA), (Dip 'N' Grow, Inc., Clackamas, Oreg.).

*Intermittent mist*.—Six (6) seconds every six (6) minutes.

*Light*.—30–50% shade cloth over propagation bench.

*Media*.—Peat-perlite.

Plant description:

*Plant form and growth habit*.—Perennial deciduous tree, mostly upright with horizontal branching.

*Plant size*.—A five (5) year old tree will attain a height of about 250 cm and a width of about 110 cm.

*Vigor*.—Similar to other *Cornus florida* cultivars.

*Branching habit*.—Moderate, branch crotch angles of about 45–50° to main trunk, less on upper branches.

*Main stem/trunk description*.—Diameter: About 3.8 cm; bark texture: smooth; bark color: gray 202C.

*Lateral branch description*.—Branch angle of about 50° with a range of 48°–55°.

## Foliage description:

*Arrangement*.—Simple, opposite; leaves mostly crowded towards branch apices.

*Leaf blade length (cm)*.—About 10<11.7<13.7 (n=5).

*Leaf blade width (cm)*.—About 5.5<6.1<7 (n=5).

*Petiole length (cm)*.—About 0.5<0.7<0.8 (n=5).

*Petiole diameter (mm)*.—About 0.7<0.9<1.1 (n=5).

*Shape*.—Ovate.

*Apex*.—Acuminate, leaf tip twisted 90°.

*Base*.—Cuneate, 50°–60° are unequal.

*Margin*.—Slightly undulate.

*Texture*.—Upper surface: Nearly glabrous. Lower surface: leaf hairs on vein or vein axils ( $\mu$ ) 17<26<34.

*Color*.—Yellow green 146A.

*Leaf vein pairs*.—5 to 6.5 alternate to mostly opposite.

*Petiole reflexed*.—80–90° from plane of leaf blade.

*Bipolar trichomes*.—Upper surface ( $\mu$ ) — 6<7.8<12.

Lower surface ( $\mu$ ) — 9<11.1<14.

## Flower description:

*Fragrance*.—None observed.

*Flower bud size*.—Width: 7 mm (widest diameter).

Length: 5 mm (base to tip).

*Shape of involucral bracts*.—Obovate/pandurate.

*Apex shape of involucral bracts*.—Retuse.

*Base shape of involucral bracts*.—Cuneate.

*Number of bracts*.—4 (in two pairs).

*Natural flowering season*.—1999: about 16 days (April 10 through April 26). 2000: about 17 days (April 4 through April 21). 2001: about 15 days (April 12 through April 27).

*Inflorescence arrangement*.—Typical of species, creamy white bracts slightly overlap.

*Inflorescence diameter*.—About 27–28 cm wide.

*Bract dimensions*.—Upper bracts about 13.7 cm long by 12 cm wide. Inflorescence is 6.4 mm wide; anther length is 1.4 mm. Floral development is asynchronous among inflorescence.

*Color (abaxial and adaxial surfaces)*.—Creamy white (155B) clefts.

*Sepals*.—Typically 4 deeply pigmented (red purple 60A).

*Stamens*.—Typically 4.

*Pistil*.—Typically 1.

*Petal color (abaxial and adaxial surfaces)*.—Yellow green 151B.

*Flower number*.—26.

*Ovary*.—Bilocular with each locule having 1 ovule.

## Fruit description:

*Berry type*.—Drupe (about 14 mm by 7 mm) aggregated in one mass.

*Color*.—10R(6/10) using Munsell Color Chart for Plant Tissues (Munsell Color, Baltimore, Md. 21218).

*Disease resistance*: This cultivar demonstrated outstanding resistance to powdery mildew superior to that of any other white flowering dogwood cultivar known to the inventors. No susceptibility to other diseases or arthropod pests was observed.

What is claimed is:

1. A new and distinct cultivar of Dogwood tree, *Cornus florida*, named 'Kay's Appalachian Mist', as illustrated and described.

\* \* \* \* \*



	AS	KAM	JAS	C9	KAB	CP	SPR	CB
AS	1.00							
KAM	0.80	1.00						
JAS	0.76	0.76	1.00					
C9	0.75	0.70	0.77	1.00				
KAB	0.79	0.79	0.78	0.75	1.00			
CP	0.78	0.84	0.82	0.78	0.85	1.00		
SPR	0.78	0.82	0.76	0.77	0.82	0.86	1.00	
CB	0.79	0.77	0.73	0.72	0.78	0.79	0.82	1.00

LEGEND: AS = 'Appalachian Spring', KAM = 'Kay's Appalachian Mist', JAS = 'Jean's Appalachian Snow', C9 = 'Cloud Nine', KAB = 'Karen's Appalachian Blush', CP = 'Cherokee Princess', SPR = 'Springtime' and CB = 'Cherokee Brave'. All are white bract dogwoods except CB, which is red.

FIG. 2

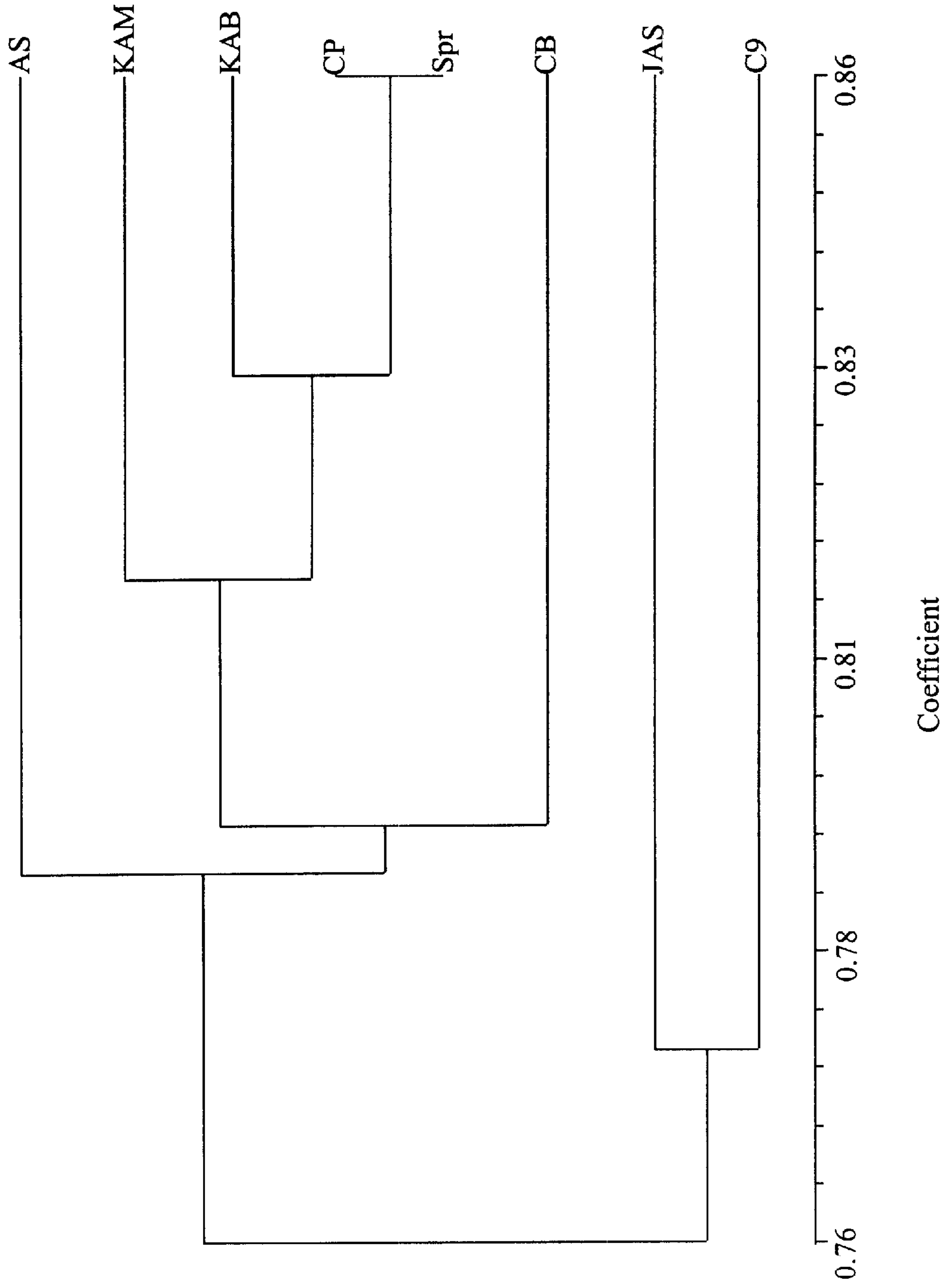


FIG. 3

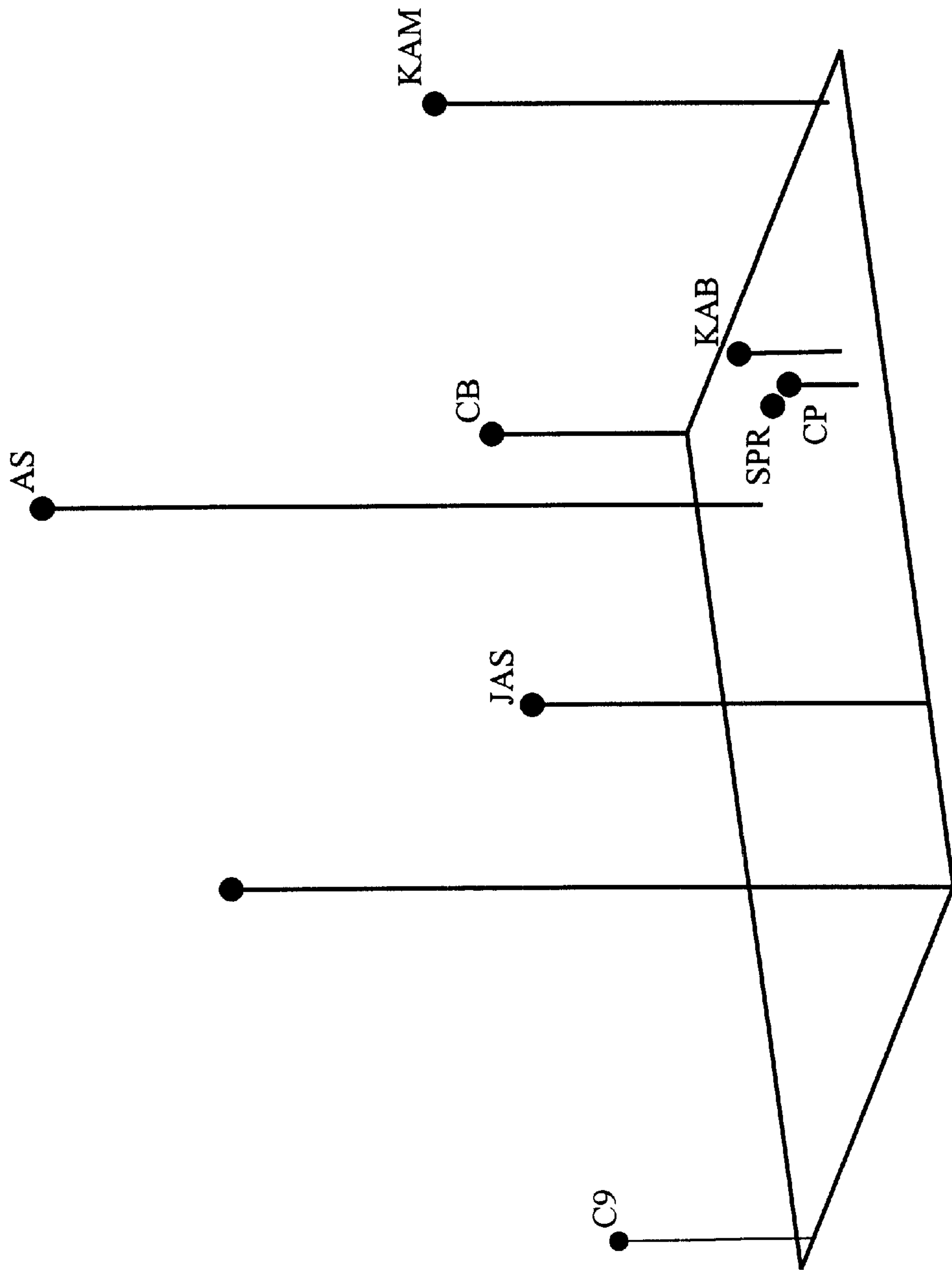


FIG. 4