

W. DENNIS CLARK, PhD
CURRICULUM VITAE

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EDUCATION Ph.D. in Botany (Plant Chemistry), 1977, University of Texas
 B.A. in Biological Sciences, 1970, Sacramento State College

PROFESSIONAL EXPERIENCE

1976-2006 Faculty, Dept. of Plant Biology, Arizona State University
2004-present Adjunct Professor, Southwest College of Naturopathic Medicine
1989-1990 Visiting Faculty, Department of Botany and Plant Sciences, University of
 California at Riverside
1983-1984 Guest Professor, Institut für Pharmazeutische Biologie, Universität Heidelberg
1976-1981 Assistant Professor of Botany, Arizona State University
1975-1976 Assistant Instructor and Welch Foundation Research Fellow, University of Texas
1971-1972 Assistant Herbarium Curator, Sacramento State College
1970-1971 Graduate Assistant, Sacramento State College
1969-1971 Research Assistant, Sacramento State College

PROFESSIONAL SERVICE

Scientific Advisor, Center for the Study of Carbon Dioxide and Global Change, Tempe, AZ
Institutional Review Board, Southwest College of Naturopathic Medicine, Tempe, AZ
Strategic Advisor, Nutri-Health Supplements, Cottonwood, AZ
Scientific Advisor, Larrea Biosciences Corp, Houston, TX

COURSES TAUGHT

Plant Chemistry and Pharmacognosy
General Botany/Plants & Society/Concepts in Plant Biology
Survey of the Plant Kingdom/Comparative Plant Diversity
Plant Secondary Metabolism
Medical Botany
Chemosystematics
Laboratory Methods in Chemosystematics
Perspectives in Plant Research (Molecular Systematics)
Ethnopharmacology
Integrative Medicine and Society

GRADUATE STUDENTS SUPERVISED

Charles H. Pickett, 1978 (MS: Pugnacious ants on *Opuntia acanthocarpa*)
Bruce D. Parfitt, 1981 (MS: Systematics of the *Opuntia curvospina* complex)
Gregory K. Brown, 1981 (PhD: Systematics of *Haplopappus* Section *Gymnocomma*)
Michael J. Knox, 1983 (MS: \exists -Phenethylamine Variation in *Mammillaria*)

George A. Ruffner, 1985 (PhD: Ecology of Extrafloral Nectaries on *Ferocactus acanthodes*)
Robert A. Sinnott, 1989 (MNS: Laboratory Manual for General Botany)
Lisa E. Clark, 1989 (MS: Variation of Flavonoid Aglycones in *Isocoma*)
Michael J. Chamberland, 1990 (MS: Systematics of *Echinocactus*)
Renee Van Buren, 1994 (PhD: Molecular Systematics of *Ranunculus*)
Gregory A. Owens, 1995 (PhD: Chemotaxonomy of *Juniperus*)
Robert A. Sinnott, 1995 (PhD: Plant Genetic Engineering in Medicine)
Nicole Plotkin, 1999 (MS: Ethnobotany of Plants Used to Treat Arthritis)
Barbara M. Schmidt, 2001 (MS: Effects of CO₂ Enrichment on Flavonoid Metabolism)
Krya B. Perry, 2003 (MS: Effects of *Scutellaria baicalensis* Extracts on Brain Cancer Cells)
Melonni Dooley, 2005 (MS: Use of *Scutellaria baicalensis* Against Pancreatic Cancer)
Kimberlee Belsley, 2005 (MS: Optimizing Secondary Metabolism in Hairy Root Cultures)
Dwayne Kirk, 2005 (PhD: Development of Program for Plant-Based Vaccines)

UNDERGRADUATE/OTHER STUDENTS SUPERVISED

Since 1976, approximately 100 undergraduate students have completed research projects under my supervision.

Since 1994, 19 high school students have come into my lab to learn about scientific research, via the Scientific Enrichment Program for Students at the Barrow Neurological Institute, Phoenix, Arizona

FEDERAL RESEARCH SUPPORT

- 1979 National Science Foundation. "Systematics of *Haplopappus* Section *Haplopappus* (Compositae)." \$50,618 (24 months)
1983 Alexander von Humboldt Foundation, Federal Republic of Germany: "Flavonoids of Valerianaceae and Compositae." ca. \$25,000 (12-month fellowship plus supplies for research in Heidelberg and Darmstadt, West Germany)
1989 National Science Foundation, Mid-Career Fellowship in Environmental Biology: "Molecular Phylogenetics in the Bromeliaceae." \$51,000 (13-month fellowship plus supplies for research at the University of California, Riverside)
1997 U.S. Department of Agriculture: "Significance of UV-induced autofluorescence in leaves." \$160,000 (36 months). Co-PI with T.A. Day

MEETING/CONFERENCE PRESENTATIONS (approx. 50 published abstracts)

American Association of Cancer Researchers, 2004
American Institute for Cancer Research, 2005
American Society of Pharmacognosy: 1984, 2004
Arizona-Nevada Academy of Science: 1977-78, 1981-82
Botanical Society of America: 1974-75, 1978-83, 1986-93
Gesellschaft für Arzneipflanzenforschung: 1984
International Botanical Congress: 1987
International Whole Person Healing Conference, 2003, 2005
International Society of Chemical Ecology: 1987
Phytochemical Society of North America: 1974, 1979, 1983, 1985, 1994, 1997-99
Southwestern Association of Naturalists: 1985

PAST APPOINTED OR ELECTED POSITIONS

Secretary, Phytochemical Society of North America

INVITED LECTURES

- 1976 "*Chemosystematics of the Genus Hazardia (Compositae)*" Department of Botany and Microbiology, Arizona State University.
- 1978 "*Function of Extrafloral Nectaries in Opuntia acanthocarpa (Cactaceae)*" Department of Developmental and Cell Biology, Univ. of California, Irvine.
- 1979 "*HPLC Methods for Flavonoid Studies*" Department of Botany, Phytochemical Section, University of Texas.
- 1980 "*Chemical and Ecological Studies in the Cactaceae*" Department of Biology, Northern Arizona University.
- 1982 "*Chemical and Ecological Studies in the Cactaceae*" Department of Ecology and Evolutionary Biology, University of California, Irvine.
- 1983 "*Chemical and Ecological Studies in the Cactaceae*" Institut für Pharmazeutische Biologie, Universität Heidelberg.
"*Chemical and Ecological Studies in the Cactaceae*" Institut für Botanik, Technische Hochschule Darmstadt.
- 1984 "*Chemical and Ecological Studies in the Cactaceae*" Department of Biology, Yavapai College.
"*Chemistry and Systematics of Haplopappus and Its Segregate Genera (Compositae)*" Institut für Botanik, University of Cologne.
"*Chemistry and Systematics of Haplopappus (Compositae) and Related Genera*" Department of Botany, Arizona State University.
- 1986 "*Taxonomic and Ecological Applications of Plant Phenolic Studies*" U.S.D.A. Water Conservation Laboratory, Phoenix, Arizona.
- 1987 "*Applications of HPLC Diode-Array Detection Technology in Studies of Plant Phenolics*" American Chemical Society Symposium on Chemistry and Applications of Polyphenolics in Plants, Denver, Colorado.
"*Recent Developments in HPLC for Plant Chemosystematics*" Department of Botany, University of Wyoming
"*Chemical Variation in Plants: Taxonomic and Ecological Applications*" Department of Biology, Yavapai College, Arizona.
- 1988 "*Chemical Variation in Plants: Qualitative and Quantitative Studies Using HPLC*" Rancho Santa Ana Botanic Garden, Claremont, California.
- 1990 "*Systematics of the Pineapple Family (Bromeliaceae)*" Department of Botany and Plant Sciences, University of California, Riverside.
"*The Molecule of the Year and Plant Systematics: Applications of DNA Sequence Studies to the Relationships of the Bromeliaceae*" Rancho Santa Ana Botanic Garden, Claremont, California.
- 1991 "*Molecular Systematics of the Bromeliaceae and Related Monocots*" Department of Botany, Arizona State University
- 1994 "*Relationships of Monocots Based on DNA Sequence Data*" U.S.D.A. Water Conservation Laboratory, Phoenix, Arizona.
- 1998 "*Antiviral Phenolics from Plants*" Biotechnology Group, Arizona State University
"*Herbal Relaxants*" Medical Study Groups at Good Samaritan Hospital and Veterans Administration Hospital, Phoenix, Arizona
"*Chemistry and Pharmacology of Ginkgo biloba*" Medical Study Group at Good Samaritan Hospital

- 1999 "Current Medical Uses for the Creosote Bush (*Larrea tridentata*)" Annual conference, Arizona Naturopathic Association
- 2000 "Poisonous Plants of the Desert" Mesa Public Library
- 2000 "Workshop on Modern Herbal Medicine" Mesa Public Library
- 2001 "Issues in Herbal Medicine" Program for Science, Technology, & Society, Penn State University
- 2003 "Current Medical Research on *Ginkgo biloba* and *Larrea tridentata*" Program for Science, Technology, & Society, Penn State University
- 2003 "Scientific Research on Acupuncture and Traditional Chinese Medicine" Commencement Address, Phoenix Institute of Herbal Medicine and Acupuncture

PATENTS

R.A. Sinnott, W.D. Clark, and K.F. DeBoer. Nontoxic extract of *Larrea tridentata* and method of making same. U.S. Patent #5,837,252 (Nov 1998), with modification patents #5,945,106 (Aug 1999), #6,004,559 (Dec 1999), and #6,039,955 (Mar 2000).

PUBLICATIONS

Books

- Randy Moore, **W. Dennis Clark** and Darrell Vodopich. 1998. *Botany*, 2nd ed. McGraw-Hill/Wm. C. Brown Publishers, Dubuque, IA.
- W. Dennis Clark**. 2003. *Treating Herpes Naturally with Larrea Tridentata*. U.S. Botanicals, Tempe, AZ.
- Dennis Clark**. 2009. *Probiotics: Beneficial Bacteria for Health and Longevity*. Nutri-Health Supplements, Cottonwood, AZ.
- Dennis Clark**. 2010 (ebook). *HCG Diet Recipes: How to Get the Maximum Flavor and Enjoyment Out of Your HCG Diet Program*. Starfish Solutions, LLC, Tempe, AZ.
- Dennis Clark**. 2011 (ebook). *HCG Diet: The New Definitive Guide*. Starfish Solutions, LLC, Tempe, AZ.
- Dennis Clark**. 2013 (ebook). *Fat Loss Biology: The Science Behind Why We Get Fat and How to Lose It*. Starfish Solutions, LLC, Tempe, AZ.
- Dennis Clark**. 2014 (Kindle). *Shingles Natural Treatment*. Starfish Solutions, LLC, Tempe, AZ.
- Dennis Clark**. 2014 (Kindle). *Calorie Counting Madness: Surprising Truths About Weight Loss*. Starfish Solutions, LLC, Tempe, AZ.

Journal Articles and Book Chapters

1. **Clark, W.D.** and T.J. Mabry. 1978. Systematic implications of flavonoids in *Hazardia*. *Biochem. Syst. Ecol.* 6: 19-20.
2. Pickett, C.H. and **W.D. Clark**. 1979. The function of extrafloral nectaries in *Opuntia acanthocarpa* (Cactaceae). *Amer. J. Bot.* 66: 618-625.
3. **Clark, W.D.** The taxonomy of *Hazardia* (Compositae-Astereae). 1979. *Madrono* 26: 105-127.
4. Brown, G.K. and **W.D. Clark**. 1979. IOBP Chromosome Number Reports LXV, Compositae. *Taxon* 28: 635.
5. **Clark, W.D.** and G.K. Brown. 1980. Uses of high performance liquid chromatography in phytochemical studies. *Phytochem. Bull.* 13: 2-23.

6. **Clark, W.D.**, L.E. Urbatsch, R.L. Hartman, R.A. Mayes and T.J. Mabry. 1980. Systematic implications of flavonoid patterns in *Haplopappus segregates*. *Biochem. Syst. Ecol.* 8: 257-259.
7. **Clark, W.D.** and B.D. Parfitt. 1980. Flower flavonoids of *Opuntia* series *Opuntiae*. *Phytochemistry* 19: 1856-1857.
8. **Clark, W.D.**, G.K. Brown and R.L. Mays. 1980. Flower flavonoids of *Opuntia* subgenus *Cylindropuntia*. *Phytochemistry* 19: 2042-2043.
9. **Clark, W.D.**, G.K. Brown and R.A. Mayes. 1980. Pollen morphology of *Haplopappus* and related genera. *Amer. J. Bot.* 67: 1391-1393.
10. Moser, T.J., T.H. Nash III and **W.D. Clark**. 1980. Effects of long-term field sulfur dioxide fumigation on Arctic caribou forage lichens. *Can. J. Bot.* 58: 2235-2240.
11. Ayanoglu, E., A. Ulubelen, **W.D. Clark**, G.K. Brown, R.R. Kerr and T.J. Mabry. 1981. Myricetin and quercetin methyl ethers from *Haplopappus integerrimus* var. *punctatus*. *Phytochemistry* 20: 1715-1717.
12. Oksuz, S., A. Ulubelen, **W.D. Clark**, G.K. Brown and T.J. Mabry. 1981. Flavonoids of *Haplopappus canescens*. *Rev. Latinoamer. Quim.* 12: 12.
13. **Clark, W.D.**. 1981. High performance liquid chromatographic identification of flavonoid mono- and disaccharides. *Phytochem. Bull.* 14: 8-11.
14. Shane, J.D. and **W.D. Clark**. 1981. Recovering polymerized fossil palynomorph residues. *Micropaleontology* 27: 109-110.
15. Ulubelen, A., **W.D. Clark**, G.K. Brown and T.J. Mabry. 1981. Flavonoids of *Haplopappus rengifoanus* Remy in Gay. *J. Natural Products* 44: 294-295.
16. Brown, G.K. and **W.D. Clark**. 1981. Chromosome numbers in South American *Haplopappus* Cass. (Compositae). *Amer. J. Bot.* 68: 1218-1221.
17. Ates, N., A. Ulubelen, **W.D. Clark**, G.K. Brown, T.J. Mabry, G. Dellamonica and J. Chopin. 1982. Flavonoids of *Haplopappus scrobiculatus* and *Haplopappus sericeus*. *J. Natural Products* 45: 189-190.
18. Ulubelen, A., E. Ayanoglu, **W.D. Clark**, G.K. Brown and T.J. Mabry. 1982. Flavonoids from *Haplopappus foliosus* (Compositae). *J. Natural Products* 45: 363-364.
19. Brown, G.K. and **W.D. Clark**. 1982. Taxonomy of *Haplopappus* section *Gymnocoma* (Compositae). *Systematic Botany* 7: 199-213.
20. Knox, M.J., **W.D. Clark** and S.O. Link. 1983. Quantitative analysis of \exists -phenethylamines in two *Mammillaria* species (Cactaceae). *J. Chromatogr.* 265: 357-362.
21. **Clark, W.D.** and E. Wollenweber. 1984. Flavonoids of *Ericameria laricifolia* (Asteraceae). *Z. Naturforsch.* 39c: 1184-1185.
22. **Clark, W.D.** and E. Wollenweber. 1985. Flavonoid aglycones in the resin of *Hazardia squarrosa* var. *grindelioides*. *Phytochemistry* 24: 1122-1123.
23. Wollenweber, E., I. Schober, **W.D. Clark** and G. Yatskievych. 1985. Flavonoid aglycones from two species of *Heterotheca* (Compositae). *Phytochemistry* 24: 2129-2131.
24. Knox, M.J. and **W.D. Clark**. 1986. Population variation in \exists -phenethylamines from *Mammillaria microcarpa* (Cactaceae). *Biochem. Syst. Ecol.* 14: 25-27.
25. Ruffner, G.A. and **W.D. Clark**. 1986. Extrafloral nectar of *Ferocactus acanthodes* (Cactaceae): Composition and its importance to ants. *Amer. J. Bot.* 73: 185-189.
26. **Clark, W.D.** 1987. Recovery of flavonoids from dimethyl sulfoxide. *Phytochem. Bull.* 19: 6-10.
27. Clark, L.E., E. Wollenweber and **W.D. Clark**. 1987. Flavonoid similarities among five species of *Isocoma*. *Biochem. Syst. Ecol.* 15: 643-646.
28. Adams, R.P. and **W.D. Clark**. 1988. A cross indexed synonymy of common components found in volatile essential oils. *Phytochem. Bull.* 20: 20-38.

29. **Clark, W.D.** and G.A. Owens. 1989. Analysis of plant phenolics by HPLC using diode array detection. *Phytochem. Bull.* 21: 8-14.
30. Clark, L.E. and **W.D. Clark**. 1990. Seasonal variation in leaf exudate flavonoids of *Isocoma acradenia* (Asteraceae). *Biochem. Syst. Ecol.* 18: 145-148.
31. Gaut, B.S., S.V. Muse, **W.D. Clark** and M.T. Clegg. 1992. Relative rates of nucleotide substitution at the *rbcL* locus of monocotyledonous plants. *J. Mol. Evol.* 35: 292-303.
32. Brown, G.K. and **W.D. Clark**. 1992. *Hazardia*. IN: J.C. Hickman (ed.), *The Jepson Manual: Higher Plants of California*. University of California Press, Berkeley. pp. 275-276.
33. **Clark, W.D.**, B.S. Gaut, M.R. Duvall and M.T. Clegg. 1993. Phylogenetic relationships of the Bromeliiflorae-Commeliniflora-Zingiberiflorae complex of monocots based on *rbcL* sequence comparisons. *Annals Missouri Bot. Gard.* 80: 987-998.
34. Duvall, M.R., M.T. Clegg, M.W. Chase, **W.D. Clark**, W.J. Kress, E.A. Zimmer, H.G. Hills, L.E. Equiarte, J.F. Smith, B.S. Gaut and G.H. Learn, Jr. 1993. Rapid radiation of ancestral monocotyledons into seven primary lineages indicated by analysis of the DNA sequence of a plastid locus obtained from one-hundred four species. *Annals Missouri Bot. Gard.* 80: 607-619.
35. Chase, M.W., D.E. Soltis, R.G. Olmstead, D.R. Morgan, D.H. Les, B.D. Mishler, M.R. Duvall, R.A. Price, H.G. Hills, Y.-L. Qiu, K.A. Kron, J.H. Rettig, E. Conti, J.D. Palmer, J.R. Manhart, K.J. Sytsma, H.J. Michaels, W.J. Kress, M.J. Donoghue, **W.D. Clark**, M.L. Hedron, B.S. Gaut, R.K. Jansen, K.-J. Kim, C.F. Wimpee, J.F. Smith, G.R. Furnier, S.H. Strauss, Q.-Y. Xiang, G.M. Plunkett, P.S. Soltis, S. Swenson, L.E. Equiarte, G.H. Learn, Jr., S.C.H. Barrett, S. Graham, S. Dayanandan and V.A. Albert. 1993. Phylogenetics of seed plants: an analysis of nucleotide sequences from the plastid gene *rbcL*. *Annals Missouri Bot. Gard.* 80: 528-580.
36. Landrum, L.R., **W.D. Clark**, W.P. Sharp and J. Bredecke. 1994. Hybridization between *Psidium guajava* and *Psidium guineense* (Myrtaceae). *Economic Botany* 49: 153-161.
37. **Clark, W.D.** and G.P. Titus. 1997. Applications in flavonoid research. *In*: W.V. Dashek (ed.), *Methods in Plant Biochemistry and Molecular Biology*. CRC Press, Boca Raton, FL.
38. Idso, S.B., B.A. Kimball, P.E. Shaw, W. Widmer, J.T. Vanderslice, D.J. Higgs, A. Montanari and **W.D. Clark**. 2002. The effect of elevated atmospheric CO₂ on the vitamin C concentration of (sour) orange juice. *Agriculture, Ecosystems and Environment* 90: 1-7.
39. Ruhland, C.T., F.S. Xiong, **W.D. Clark**, and T.A. Day. 2005. The influence of ultraviolet_B radiation on hydroxycinnamic acids, flavonoids and growth of *Deschampsia antarctica* during the springtime ozone depletion season in Antarctica. *Photochemistry and Photobiology* 81: 1086-1093.
40. Scheck, A., K. Perry, N.C. Hank and **W.D. Clark**. 2006. Anticancer activity of extracts derived from the mature roots of *Scutellaria baicalensis* on human malignant brain tumor. *BMC Complementary and Alternative Medicine* 6: 27.