

Plants in Human Affairs

A 12-day “intensive” course offered by the Center for Spirituality and Healing at the University of Minnesota and the Kohala Center in Kameula, Hawaii

Introduction

From the beginning of time, plants have played a role in human affairs, influencing the evolution of civilizations and cultures, human migration, medicine and health care, wars, art, mythology and religion. This twelve-day, four-credit intensive introduces students to the science of ethnobotany, ethnopharmacology, and plants in human affairs through lectures, field trips and presentations by local experts.

Location:

This is a 12-day, residential, “intensive “ format course that is taught on the Big Island of Hawaii. It is offered during the winter break each January, under the joint sponsorship of the Center for Spirituality and Healing at the University of Minnesota and the Kohala Center in Kameula, Hawaii. Residential venues and accommodations may vary from one course to the next.

Objectives:

On completion of this course, students should be able to:

- Define ethnopharmacology and ethnobotany and discuss the scope of the subject area covered by these disciplines.
- Define the principles and practices utilized in ethnopharmacological and ethnobotanical research and discuss their application.
- Discuss the prehistoric origins of agriculture, medicine, and pharmacology, and discuss the role that human/plant interactions have had in managing natural resources, and the influence of humans on the evolution, distribution, and utilization of major food and medicinal plants.
- Discuss the historical and political roles that plant migrations, trade in food and spices, exploration, and the exploitation of botanical resources have played in the development of civilizations, colonization, cultural traditions, and imperialism.
- Demonstrate comprehension of the molecular and taxonomic diversity inherent in nature, its relevance to humanity’s well being, and the importance of preserving biodiversity, species habitats, and genetic diversity.

- Discuss contemporary issues, diverse perspectives, and ethical dilemmas related to the ownership of indigenous knowledge, biopiracy, and genetic resources.
- Discuss the important role that plants have played (and continue to play) in the development of human culture, including its art, myths, religions, institutions, and material technologies.
- Discuss the contributions of ethnopharmacology to Western medicine and sciences such as pharmacology and chemistry.
- Discuss the role and importance of botanical medicines in the public health programs, ethnomedicine, and medical practices of developing countries and indigenous cultures.
- Discuss the diverse uses of psychoactive plants in traditional and indigenous cultures, and demonstrate comprehension of cross-cultural perspectives pertinent to the use and misuse of psychoactive plants.

Course Description:

This introductory course will focus on the role of plants in human affairs. The course will include a combination of topics relevant to ethnobotany and ethnopharmacology. The ethnobotanical portion will emphasize the importance of plants in the modern world, and on the influence of plant/people interactions in the evolution of civilizations and cultures, migrations of peoples and plants, cross-cultural contacts, wars, genocide, art, mythology, and religion, as well as topics on the traditional uses of plants by indigenous peoples. Ethnopharmacology combines aspects of botany, natural products chemistry, conventional pharmacology, pharmacognosy, anthropology, medicine, and even psychology and the comparative study of religions. Ethnopharmacology is a synthetic discipline whose subject matter focuses on traditional human uses of biologically active plants and animals as medicines, poisons, and "recreational" or ritual intoxicants. This course will cover both the ethnographic and scientific aspects of ethnopharmacology about equally. Emphasis will be placed on helping students to appreciate the importance of ethnopharmacological investigations in the process of drug discovery and the evolution of medicine, and to develop a cross-cultural perspective on human interactions with drugs and toxins.

Instructors:

The teaching faculty will be Dennis McKenna, Ph.D., Senior Lecturer at the Center for Spirituality and Healing, and Kathleen Harrison, M.A. Instructor in Ethnobotany at Sonoma State University, and President of Botanical Dimensions, a non-profit organization dedicated to the collection, preservation, and scientific investigation of ethnomedically significant plants and their attendant cultural information. Botanical Dimensions maintains a private botanical preserve of rare medicinal plants on the Kona side of the Big Island.

Kathleen Harrison, M.A.

President & Project Director

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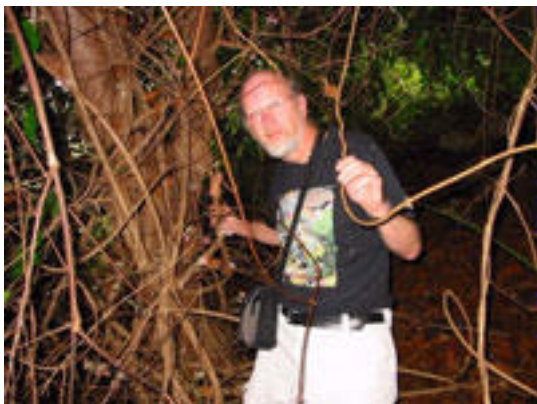
Kathleen Harrison is an ethnobotanist and artist whose work focuses especially on ways that people express their knowledge of nature through myth, ritual, art, and song, as well as through their medicine. Her extensive fieldwork in Mexico and the Amazon fills her work with stories and experienced insight. She teaches widely at herbal conferences, and also at California School of Herbal Studies, Sonoma State University, and New College of California. Kathleen also practices and teaches botanical illustration. Now and then, she leads ethnobotanical fieldtrips to Latin America or Hawaii. She does this

under the auspices of Botanical Dimensions, the non-profit organization she co-founded in 1986, that works to document, nourish and understand medicinal and shamanic plant knowledge from various cultures.

Dennis J. McKenna, Ph.D.

Senior Lecturer, Center for Spirituality and Healing, University of Minnesota

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Dennis McKenna has worked in the interdisciplinary fields of pharmacognosy, ethnopharmacology, and ethnobotany for over twenty years. He received his Master's Degree in Botany from the University of Hawaii in 1979, and his Ph.D. in Botanical Sciences from the University of British Columbia in 1984. His doctoral research focused on phytochemical and pharmacological investigations of Amazonian ethnomedical plants. He is a founding board member

and Director of Ethnopharmacology for the Heffter Research Institute, a non-profit organization dedicated to supporting research into the medical applications of psychedelic substances, and was a primary organizer and key scientific collaborator for the Hoasca Project, an international biomedical study of Hoasca, a psychoactive drink used in ritual contexts by Amazonian peoples and syncretic religious groups in Brasil. He has served as a board member and Research Advisor to Botanical Dimensions, a non-profit organization dedicated to the investigation of ethnomedically significant plants. He has conducted extensive ethnobotanical fieldwork in the Peruvian, Colombian, and Brazilian Amazon. Dr. McKenna's publications have appeared in the *Journal of Ethnopharmacology*, *European Journal of Pharmacology*, *Brain Research*, *Journal of Neuroscience*, *Journal of Neurochemistry*, *Economic Botany*, and elsewhere.

Syllabus and Course Schedule (note: the schedule and topics are subject to change)

The courses will consist of a combination of in-class lectures, field trips, and guest presentations by local experts familiar with Hawaiian ethnobotany and ethnomedicine. There are a total of 10 class days. The weekends will be free time with no classes, but there is an optional tour of Hawaii Volcanoes National Park scheduled for one Saturday during the middle of the course. The lectures and field trips will be supplemented with online resources and required and optional readings from a variety of sources.

Course Packet: A course packet of required readings will be available at the University of Minnesota Bookstore in Coffman Union. The course packet is also available by mail through the Bookstore.

Eligibility: This course is open to juniors, seniors and graduate students from the University of Minnesota as well as students from other colleges and universities. Non-University of Minnesota students taking the course for credit will receive credit from the University of Minnesota. Students should check with their institution about credit transfer to their home institution. The course may be taken for graduate or undergraduate credit. Adult learners are welcome to enroll. There are no prerequisites for the course. Previous courses in biology or botany, other life sciences, anthropology, chemistry, or pharmacology are useful and recommended, but are not required.

Disability Information: Any student with a documented disability (e.g., physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the course instructor (mcken031@umn.edu, or 612-624-0112) and Disability Services (612-626-1333) before registering for the course or traveling to Hawaii. All discussions will remain confidential.

ASSIGNMENTS FOR CREDIT: (4.0 credits total; 60 hours of class time)

Grading: A - 90-100%; B – 80-89%; C – 70-79%; D – 60 – 69%; F - < 60%.

S/N (Pass/Fail): At least 70% is required for a grade of S.

No-credit (audit) option is also available.

Exams:

Quiz # 1 (10%)

Quiz # 2 (10%)

Final Exam (25%)

Total: 45%

Review/critique of three articles from assigned or optional readings. No more than 2 pages each (15%)

Family Ethnobotany – 2 pages (5%).

Daily Log of Plant Encounters from Day 1 through day 7 of the course (20%)

Pacific Plant Profile – Oral Presentation (~15 min) (15%)

Classes will generally be held 8:30 a.m.-11:30 a.m. and 12:30 – 3:30 p.m. with exceptions as noted, including field trips and occasional evening lectures.

SYLLABUS

Day 1

Morning session:

Welcome and Orientation

Student introductions, class structure, credit assignments and grading

Plants & Civilization: Introduction to Ethnobotany – Kathleen Harrison

People, Plants and Drugs: Introduction to Ethnopharmacology – Dennis McKenna

Afternoon session:

**Basic Botany: Folk Taxonomy and Linnean Botanical Nomenclature and Classification
– Kathleen Harrison**

**Molecular Diversity in Nature: Introduction to Basic Chemistry and Natural Products
– Dennis McKenna**

Day 2

Morning session:

**Gathering and Tending the Wild: pre-agricultural resource management –
Kathleen Harrison**

The Origins of Agriculture & the Story of the Grains – Kathleen Harrison

Afternoon session:

**The World-wide (phytochemical) web: Plant/human symbiosis and co-evolution –
Dennis McKenna**

**Ethnopharmacology and drug discovery : New Medicines from Ancient Wisdom –
Dennis McKenna**

Online Resources for Phytomedicine Researchers (handout)

Day 3

Morning session:

Who's Moving Whom? Starchy Staples & Plant Migration – Kathleen Harrison

The Spice Trade, the Age of Exploration and Imperialism - Kathleen Harrison

Afternoon session:

Sugar, slavery, and colonization – Kathleen Harrison

**Who Owns Plant Wisdom? -- Biodiversity, Indigenous Knowledge, and Biopiracy –
Dennis McKenna**

Evening session: Polynesian Ethnomedicine. Guest Lecture by Dr. Paul A. Cox, Director of the National Tropical Botanical Garden on Kauai

Day 4

Field trip.

Morning: Leave at 8 a.m. for tour of Amy Greenwell Ethnobotanical Garden (10 a.m.).

Director Peter van Dyke. Guest lecture on Hawaiian Ethnobotany

Afternoon: Visit to City of Refuge at Puuhonuaunau

On site lecture: Kava: A Traditional Polynesian Beverage, a Modern Phytomedicine – Dennis McKenna (handout, class discussion)

Return to Residence by 6 p.m.

8-10 p.m. Visit to a Nakamal, a traditional kava bar, in Kailua (optional)

Day 5

Morning session:

Phytotherapy: the most popular botanical medicines & their applications - Dennis McKenna

Workshop: Scents, Perfume and Aromatherapy (an experiential lecture) – Kathleen Harrison

Chemistry & Sources of Sensoritropic Natural Products – Dennis McKenna (handout)

Afternoon session:

Workshop:

Herbal Medicine Then and Now (hands-on preparation of tinctures and salves) – Kathleen Harrison with herbalist & medicinal herb farmer Lisa Minor

Saturday Field Trip (optional, but no extra cost): Tour of Hawaii Volcanoes National Park and active lava flows .

Leave residence at 7:30 a.m., return at 10:30 pm. Packed lunches will be furnished, evening meal will be at the Volcano House snack bar.

Day 6

Morning session:

Plants in Art and Mythology – Kathleen Harrison

Plants in Material Culture – Kathleen Harrison

Afternoon session:

Healing Poisons: Ethnotoxicology & Ethnozoopharmacology – Arrow poisons, piscicides, animal toxins and their uses – Dennis McKenna

Day 7

Morning session:

Seaweeds as Food and Medicine: Traditions and the Future - Kathleen Harrison

Afternoon session:

Seapharm: Marine Natural Products and Drug Discovery – Dennis McKenna
Video: Stings, Fangs & Spines. Discovery Channel documentary on the uses of natural toxins in medicine.

Day 8

Morning session:

Due today: Article critiques; Family ethnobotany reports

Sacred Medicine Rituals in Traditional and Contemporary Cultures — Kathleen Harrison

Plants and the Mind: Ethnopharmacology of psychoactive agents:- Dennis McKenna

Afternoon session:

Shamanic Medicine: Psychedelic Plants in Ethnomedicine – Dennis McKenna
Natural Products & the Search for New Psychotherapeutic Medicines (handout)

Evening videos:

Don Emilio and His Little Doctors (film by Luis Eduardo Luna)

The Hoasca Project

Shamans of the Amazon by Dean Jefferies

Day 9

All day field trip

Due today: Daily log of Plant Encounters

Field trip: Botanical Dimensions Ethnomedical Plant Preserve, in South Kona. Tour by Kathleen Harrison and upland horticulturalist Wave Spofford.

Lunch: Ethnobotanical Feast prepared on site!

Field lecture: Plant Teachers: Sacred Medicines in Amazonian Shamanism – Kathleen Harrison

Return to Residence Hotel by 6 pm

Day 10

Morning session:

Final Exam

Students' oral presentations: Pacific Plant profiles

Afternoon session:

Students' oral presentations (continued)

Recap and discussion of the course

Reading List

Below is a partial list of some of the reading materials included in the course packet. Occasionally, different articles may be substituted for some of those that are listed here.

Buhner, SH (2002) All Plants are Chemists. IN *The Lost Language of Plants: The Ecological Importance of Plant Medicines to Life on Earth*. Chelsea Green Publishing. White River, Vermont.

Cragg GM & Newman DJ (2002) Drugs from nature: Past achievements, future prospects. IN: Iwu, MU & Wootton JC (eds.) *Ethnomedicine and Drug Discovery. Advances in Phytomedicine* 1. Elsevier.

Davis, W. (2002) Chapter One: The wonder of the ethnosphere & Chapter Seven: A thousand ways of being IN: *Light at the Edge of the World*. National Geographic Society, Douglas & McIntyre, Vancouver

Dixon AR, McMillen H & Etkin NL (1999) Ferment this: the transformation of Noni, a traditional Hawaiian Medicine. *Economic Botany* 53:51-68.

Dossey, Larry (2001) Being Green: On the Relationships Between People and Plants. Alternative Therapies in Health and Medicine Vol. 7: 12-16, 132-139.

Elisabetsky, E (2002) Traditional medicine and the new paradigm of psychotropic drug action. IN: Iwu, MU & Wootton JC (eds.) *Ethnomedicine and Drug Discovery. Advances in Phytomedicine* 1. Elsevier.

Etkin, N. L. (1996) Medicinal cuisines: Diet and Ethnopharmacology. International Journal of Pharmacognosy 34: 313-326

Gollin, Michael (2002) Linking intellectual property rights with traditional medicine. IN: Iwu, MU & Wootton JC (eds.) *Ethnomedicine and Drug Discovery. Advances in Phytomedicine* 1. Elsevier.

Gutmanis, J (1976) The herbal medicines of Hawaii now. Chapter 11 in: *Kahuna La'au Lapa'au (The Practice of Hawaiian Herbal Medicine)*. Island Heritage Publishing, Aiea, Hawaii

Holmstedt, B. Historical perspective and future of ethnopharmacology. In: *Ethnobotany: Evolution of a Discipline*, by Richard Evans Schultes and Siri von Reis. (1995: Dioscorides Press) pp. 320-337.

Iwu, M (2002) Ethnobotanical approach to pharmaceutical drug discovery: strengths and limitations. IN: Iwu, MU & Wootton JC (eds.) *Ethnomedicine and Drug Discovery. Advances in Phytomedicine* 1. Elsevier.

- Jain, SK (2000) Human aspects of plant diversity. Economic Botany 54:459-470
- Johns, T. 1999. The chemical ecology of human ingestive behaviors. Annual Review of Anthropology. 28:27-50
- Kilham, C. (2000) Nights of Kava, Fragrant Hill, pp. 219-248 in: *Tales from the Medicine Trail* Rodale Books.
- Lake, James, Psychotropic Medications from Natural Products: A Review of Promising Research and Recommendations. (2000) Alternative Therapies in Health and Medicine 6:36-60.
- Lee, RA, Bailick, MJ, et al., (2001) Cultural dynamism and change: An example from the Federated States of Micronesia. Economic Botany 55:9-13
- Mendelsohn, Robert & Michael J. Balick (1995) The value of undiscovered pharmaceuticals in the rainforest. Economic Botany 49:223-228.
- Metzner R (1998) Hallucinogenic drugs and plants in psychotherapy and shamanism. Journal of Psychoactive Drugs 30:333-41.
- Newton, P & N. Wolfe (1992) Can animals teach us medicine? British Medical Journal 305: December 1992 (pages not cited)
- Plotkin, M. (2000) Some Poison for your Pain? Chapter 1 in *Medicine Quest: In Search of Nature's Healing Secrets*. Viking Press.
- Prendergast, HD & Dolley, D (2001) Jesuit's Bark and other medicines. Economic Botany 55:3-6.
- Scheuer PJ (1996) Marine natural products: Diversity in molecular structure and bioactivity. Advances in Experimental Medicine and Biology 391: 1-8
- Schultes, R. E. (1981) Phytochemical gaps in our knowledge of hallucinogens. In L. Reinhold, J.B. Harbourne & T. Swain (eds.) *Progress in Phytochemistry Vol. 7*. Pergamon Press.
- Schultes, R.E. (1969-70) The plant kingdom and hallucinogens Parts I – III). Bulletin on Narcotics XXI: 3-52
- Shulgin, A.T. & Shulgin, A (1997) Cui bono? Chapter 24 in: *TIHKAL: The Continuation*. Transform Press, Berkeley, CA.
- Shulgin, A.T. & Shulgin, A (1997) DMT is Everywhere. Chapter 16 in: *TIHKAL: The Continuation*. Transform Press, Berkeley, CA.

Significant Discoveries. In: Judith Sumner, *The Natural History of Medicinal Plants* Chapter 6, pp. 125 – 144

Tyler V.E. (1966) The physiological properties and chemical constituents of some habit-forming plants. *Lloydia* 29:275-293

Whistler, W.A. (1992) Traditional Polynesian Medical Practices. Chapter 2 in: *Polynesian Herbal Medicine*, National Tropical Botanical Garden, Lawai, Kauai, Hawaii

Wink, M (1999) Introduction: Biochemistry, role and biotechnology of plant secondary compounds. Chapter 1, pp. 1-16 IN: Wink, M (ed) *Biochemistry of Plant Secondary Metabolism*. Sheffield Academic Press, CRC Press