

EEB 485 ETHNOBIOLOGY & ETHNOMEDICINES (CRN: 70305)

Mini-Term Summer 2020; MTWTF 1:00–4:00pm; Zoom (<https://tennessee.zoom.us/j/95124620585>)

Instructor

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Course Description: Ethnobiology studies the dynamic relationships between human and their environment. Understanding of the drivers of human decision making and choice in plant and animal use is critical for designing globally sustainable management plans. What are the theories and hypotheses commonly tested in ethnobiology? What types of data are collected to test these hypotheses? How are these data analyzed to understand the link between plant and culture, the way in which human, by selecting certain organs on certain plant species in specific location, and at some specific time, have shaped their environment? How environmental feedback constrained the nature and extent of human-plant interactions? The ultimate goal of this class is to guide students in conducting hypothesis/theory-driven research in ethnobiology. We will review various theories and hypotheses in ethnobiology. Second, we will learn the different methods used in ethnobotanical research and finally we will identify the major types of data commonly collected in this field and how these data are analyzed. At the end of this course students will be able to develop and test simple hypotheses in ethnobiology and discuss how they fit into the broad ethnobiology literature. Although this course method is applied to ethnobiology, the course can be of interest to students interested in learning about how to use the scientific method in biology in general.

Course philosophy and method: This class meets online over Zoom five times a week and involves a combination of brief lectures, discussions and in-class group exercises. This course uses a participatory approach to assist student participants in identifying theories, developing hypotheses and discussing various methodological approaches in ethnobotany. Students will read, discuss and present theory/major hypothesis in ethnobiology. We will discuss 25 short peer-reviewed journal articles (see Lecture schedule) in 15 days to gain deeper understanding of the theoretical background in ethnobiology. These papers introduced or tested the theories we will cover in this class. In reading these papers before class, students must achieve three goals: (a) clearly identify the central prediction of the theory/hypothesis, (b) brainstorm about the way in which this theory/hypothesis has been tested, and (c) think about one discussion point based on the conceptual challenges and/or methodological limitations identified from the paper. Students are expected to come to class ready to ask and answer questions, comment and contribute critical insights on the theory/hypothesis and how they may test such theory in their own research. Some of the authors of these papers will be invited to address the class and answer questions via Zoom. The instructor moderates the discussion and points out how these theories are related to each other. The instructor also leads the class to identify new hypotheses from the theory, and how these hypotheses can be tested: what could be the study design, suitable study system/cultural group to use, what are response and predictor variables that will be collected and what statistical analysis can be performed. The assessment for this class is designed to lead students to learn how to choose their research questions based on theory or ethnobiological patterns reported in the literature, and how to develop testable hypotheses, robust methodological approaches to test these hypotheses.

Recommended textbook: Alexiades, M. N., & Sheldon, J. W. (1996). Selected guidelines for ethnobotanical research: a field manual. New York Botanical Garden.

Student Learning Outcomes: At the end of this class students will be able to:

- a) Identify and explain concepts, theories and major hypotheses in ethnobiology,
- b) Develop research hypotheses, questions and specific methods in ethnobiology,
- c) Design hypothesis- and theory-driven ethnobiological research projects,
- d) Learn various types of data commonly collected in ethnobiology.

Assessment: Grades will be based on class participation, presentations, daily summaries and a two exams.

Class participation (10%): This will be a student-led course where they will have to read primary literature in ethnobotany, identify theory, hypotheses, research questions, discuss how data are collected and how they are analyzed (what technique has been used), and the main findings (as related to the theory or hypothesis). Class participation includes attendance and active participation in class discussions. To get full grade for participation, each student must ask at least one question (25/100) and answer one question or provide one main comment during the class discussion (25/100) and ask and/or post on canvas one question during the Zoom session with invited guests (50/100). For the questions to the guest, think about

questions to understand the context of the study, follow up studies they have done or would have loved to do, justification about some of their study choices, etc.

Summaries (25%): After each class session, students will write a one-page (double space) summary on their understanding and opinion on the issues discussed in class. This short essay will be due the following class.

Presentation (20%): Each student will present at least one 15min PowerPoint on the papers. The number of presentations each student will be responsible for will depend on the total number of students in the class. Each presentation will be graded for the quality of the visualization (30/100: presence and quality of the pictures, tables, figures, aesthetics of the PowerPoint) and the content of the talk (40/100: theory clearly formulated and communicated, how these were demonstrated, at least one potential hypothesis is proposed, at least 2 discussion points or questions are proposed) and the presentation skill of the student (30/100).

Midterm (20%): The ultimate goal of this class is to guide students in conducting hypothesis-driven research. Consistent with this, the exams will directly assess how well students can identify relevant theory/questions, design hypotheses and method to collect relevant data to test these hypotheses. Each student will choose an independent research topic after the 6th session and submit a 1 single spaced page (approximately 800 words) theoretical justification with two testable hypotheses for their midterm exam.

Final exam (25%): Students will use the same topic they developed for their midterm to develop and submit a 3000 words research proposal (single-spaced) for their final exam. This proposal must clearly outline the theoretical background for the proposed research, two testable hypotheses derived from the theory, the study system and methodological approach. Detailed guidelines for the mid-term and final exam are provided on canvas. **Plagiarism will result in zero grade!!**

Final letter grades will follow: A = 93-100%; A- = 90-92%; B+ = 87-89%; B = 83-86%; B- = 80-82%; C+ = 77-79%; C = 73-76%; C- = 70-72%; D+ = 67-69%; D = 63-66%; D- = 60-62%; F = <60%.

Late assignment policy: Assignments turned in after the due date will lose 25% of the points for every day (24h) with which it is late. Assignments that are 1hour late count as a day late.

Classroom communication: Check the Canvas site (<https://utk.instructure.com/>) and your UTK e-mail frequently for announcements related to this course. Readings and assignments will be posted on Canvas. If you have a general question about the course, please post them to the course discussion board on Canvas to allow the questions to be answered once for everyone. For questions that are personal or specific to an individual, please contact the instructor via your UTK e-mail (spam filters may exclude other addresses). The instructor will respond to your email within 2 working days.

Lecture schedule and required reading (This schedule is tentative and subject to change!**)**

Session	Day	Date	Topic	Readings
1	W	6-May	Theories and major hypotheses in ethnobiology [Zoom]	1
2	R	7-May	Diversification v. availability hypothesis [Zoom]	2-3
3	F	8-May	Taboos as an adaptive management strategy [Zoom]	4-5
4	M	11-May	Taboos as luxury or an adaptive management strategy [Zoom]	6-7
5	T	12-May	Plant use value theory [Zoom]	8-9
6	W	13-May	Ecological apparency hypothesis [Zoom]	10-11
7	R	14-May	Doctrine of Signatures (Midterm topics DUE) [Zoom]	12-13
8	F	15-May	Theory of non-random medicinal plant selection [Zoom]	14-15
9	M	18-May	Synthesis I — (Midterm one-page paper DUE)	—
10	T	19-May	Utilitarian redundancy model [Zoom]	16-17
11	W	20-May	Ecological/cultural keystone species [Zoom]	18-19
12	R	21-May	Urbanization and loss of knowledge [Zoom]	20-21
13	F	22-May	Age, gender and dynamics of knowledge [Zoom]	22-23
14	M	25-May	MEMORIAL DAY HOLIDAY – NO CLASS	—
15	T	26-May	Social network and dynamics of knowledge [Zoom]	24-25
16	W	27-May	Synthesis II — (Final paper DUE)	—

Day 1— Theories and major hypotheses (May 6, 2020)

1. Gaoue OG, Coe M, Bond M, Hart G, Seyler B & McMillen H (2017) Theories and major hypotheses in ethnobotany. *Economic Botany*, 71(3), 269-287.

Day 2— Diversification vs. availability/versality theory (May 7, 2020) – (Guest: Nelson Alencar)

2. Alencar, N., Araújo, S., Albuquerque, U. (2010). The inclusion and selection of medicinal plants in traditional pharmacopoeias - Evidence in support of the diversification hypothesis. *Economic Botany* 64, 68-79.
3. Bennett, B. C., & Prance, G. T. (2000). Introduced plants in the indigenous pharmacopoeia of Northern South America. *Economic Botany*, 54(1), 90-102.

Day 3— Taboos as an adaptive management strategy (May 8, 2020) – (Guest: Johan Colding | johanc@beijer.kva.se, Stockholm Resilience Centre, Sweden)

4. Colding, J., & Folke, C. (1997). The relations among threatened species, their protection, and taboos. *Conservation Ecology*, 1(1), 6.
5. McDonald, D. (1977). Food taboos: a primitive environmental protection agency (South America). *Anthropos*, 734-748.

Day 4— Taboos as luxury (May 11, 2020) – (Zoom: Diana Quiroz | diana.quiroz@uni-hamburg.de, Hamburg University)

6. Rea AM (1981) Resource utilization and food taboos of Sonoran Desert peoples. *Journal of Ethnobiology and Ethnomedicines*, 1, 69-83.
7. Quiroz, D., & van Andel, T. (2015). Evidence of a link between taboos and sacrifices and resource scarcity of ritual plants. *Journal of Ethnobiology and Ethnomedicine*, 11(1), 5.

Day 5— Plant use value theory (May 12, 2020) – (Guest: Oliver Phillips | O.Phillips@leeds.ac.uk, Leeds University, UK)

8. Phillips, O., Gentry, A.H. (1993). The useful plants of Tambopata, Peru: II. Statistical hypotheses tests with a new quantitative technique. *Economic Botany* 47, 33–43.
9. Galeano, G. (2000). Forest use at the Pacific Coast of Chocó, Colômbia: a quantitative approach. *Economic Botany*, 54(3), 358-376.

Day 6— Ecological apparency hypothesis (May 13, 2020) – (Guest: Ulysses Albuquerque | upa677@hotmail.com, Federal University of Pernambuco)

10. Endara, M. J., & Coley, P. D. (2011). The resource availability hypothesis revisited: a meta-analysis. *Functional Ecology*, 25(2), 389-398.
11. Almeida, C.F., Silva, T.C.L., et al. (2005). Life strategy and chemical composition as predictors of the selection of medicinal plants from the Caatinga (Northeast Brazil). *Journal of Arid Environments* 62, 127–142.

Day 7— The Doctrine of Signatures (May 14, 2020) – (Guest: Brad Bennett | bennett@fiu.edu, Florida International University)

12. Bennett C. (2007) Doctrine of Signatures: An Explanation of Medicinal Plant Discovery or Dissemination of Knowledge? *Economic Botany* 61(3): 246-255.
13. Leonti, M., Sticher, O., & Heinrich, M. (2002). Medicinal plants of the Popoluca, México: organoleptic properties as indigenous selection criteria. *Journal of Ethnopharmacology*, 81(3), 307-315.

Day 8— Theory of non-random medicinal plant selection (May 15, 2020) – (Guest: Daniel Moerman | dmoerman@umich.edu, University of Michigan)

14. Moerman D. (1991) The medicinal flora of native North America: an analysis. *Journal of Ethnopharmacology* 31, 1-42.
15. Ford J. & Gaoue O.G. (2017) Alkaloid-poor plant families, Poaceae and Cyperaceae, are over-utilized in Hawaiian pharmacopoeia. *Economic Botany*, 71(2), 123-132.

Day 9 – Synthesis I — MIDTERM PAPER DUE (May 18, 2020)

Day 10 — Utilitarian redundancy model (May 19, 2020) – (Guest: Ulysses Albuquerque | upa677@hotmail.com, Federal University of Pernambuco)

16. Wellnitz, T., Poff, N.L., (2001) Functional redundancy in heterogeneous environments: implications for conservation. *Ecology Letters* 4, 177–179.
17. Albuquerque, U. P. D., & Oliveira, R. F. D. (2007). Is the use-impact on native caatinga species in Brazil reduced by the high species richness of medicinal plants? *Journal of Ethnopharmacology* 113(1), 156-170.

Day 11 — Ecological/cultural keystone species theory (May 20, 2020) – (Guest: Nancy Turner | nturner@uvic.ca, University of Victoria, Canada)

18. Garibaldi, A., Turner, N., (2004). Cultural keystone species: implications for conservation and restoration. *Ecology and Society* 9, 3.
19. Platten, S., & Henfrey, T. (2009). The cultural keystone concept: insights from ecological anthropology. *Human Ecology*, 37(4), 491-500.

Day 12 — Urbanization and loss of local knowledge (May 21, 2020) – (Guest: Ina Vandebroek | ivandebroek@nybg.org, NYBG)

20. Reyes-García, V., Guèze, M., Luz, A. C., et al. (2013). Evidence of traditional knowledge loss among a contemporary indigenous society. *Evolution and Human Behavior*, 34(4), 249-257.
21. Vandebroek, I., & Balick, M. J. (2012). Globalization and loss of plant knowledge: challenging the paradigm. *PLoS One*, 7(5), e37643.

Day 13 – Age, gender and dynamics of knowledge (May 22, 2020) – (Guest: Bob Voeks | rvoeks@exchange.fullerton.edu, California State University)

22. Voeks, R. A., & Leony, A. (2004). Forgetting the forest: assessing medicinal plant erosion in eastern Brazil. *Economic Botany*, 58(1), S294-S306.
23. Souto, T., & Ticktin, T. (2012). Understanding Interrelationships Among Predictors (Age, Gender, and Origin) of Local Ecological Knowledge. *Economic Botany*, 66(2), 149-164.

Day 14 – Memorial Day holiday — NO CLASS (May 25, 2020)

Day 15 – Social network and dynamics of knowledge (May 26, 2018) – (Guest: Allison Hopkins | hopkins@tamu.edu, Texas A&M University)

24. Hopkins, A. (2011). Use of network centrality measures to explain individual levels of herbal remedy cultural competence among the Yucatec Maya in Tabi, Mexico. *Field Methods*, 23(3), 307-328.
25. Bodin, O., Crona, B., & Ernstson, H. (2006). Social networks in natural resource management: what is there to learn from a structural perspective. *Ecology and Society*, 11(2), r2.

Day 16 – Synthesis II — FINAL PAPER DUE (May 27, 2020)

Academic integrity: Academic dishonesty of any sort will not be tolerated. Plagiarism includes the copying of phrases, portions of sentences or the main ideas from ANYONE (including a classmate) on ANY work submitted for a grade (exams, assignments, quizzes, etc). Academic dishonesty also includes assisting other students on quizzes or exams. You are expected to abide by The University of Tennessee honor statement in Biology and in all of your university activities as pledged in the honor code: “An essential feature of the University of Tennessee, Knoxville, is a commitment to maintaining an atmosphere of intellectual integrity and academic honesty. As a student of the University, I pledge that I will neither knowingly give nor receive any inappropriate assistance in academic work, thus affirming my own personal commitment to honor and integrity.” (Undergraduate Catalog). Depending on the offence, penalties for academic dishonesty range from a minimum of a zero for the assignment, to an F for the course, to the filing of formal academic dishonesty charges seeking dismissal from The University of Tennessee. These choices are at the discretion of the instructor, and can occur in either the lecture or the lab portion of the class. You should be familiar with the requisites of academic honesty and what constitutes academic dishonesty as outlined in the UT Undergraduate Catalog (<http://catalog.utk.edu/>).

University Civility Statement: Civility is genuine respect and regard for others: politeness, consideration, tact, good manners, graciousness, cordiality, affability, amiability and courteousness. Civility enhances academic freedom and integrity, and is a prerequisite to the free exchange of ideas and knowledge in the learning community. Our community consists of students, faculty, staff, alumni, and campus visitors. Community members affect each other’s well-being and have a shared interest in creating and sustaining an environment where all community members and their points of view are valued and respected. Affirming the value of each member of the university community, the campus asks that all its members adhere to the principles of civility and community adopted by the campus: <http://civility.utk.edu/>.

Disability Services: “Any student who feels s/he may need an accommodation based on the impact of a disability should contact Student Disability Services in Dunford Hall, at 865-974-6087, or by video relay at, 865-622-6566, to coordinate reasonable academic accommodations.