SUL ROSS STATE UNIVERSITY
Toxic and Medicinal Plants (BIOL 5318 - 001)
Spring 2016

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Please feel free to email questions or other communications.
Please use "Toxic & Medicinal Plants" or something similar as the subject.

Office hours: M 2:00−5:00, W 2:00−4:00, or by appointment. If you feel lucky, just drop by at random. If I am in the office, you are welcome.

Time and venue: TR 8:00−9:15 a.m. in WSB 204

Texts: Hart et al., *Toxic Plants of Texas* (Texas Cooperative Extension), is highly recommended. Supplementary reading material will be referred to and either placed on reserve in the library or handed out as paper or electronic copies, as the course progresses.

Course Description: A three-hour course on toxic and medicinal plants and their effects on mammals (including humans). The course begins with a brief overview of the history and fundamental principles of toxicology. In the second phase of the course, we examine economically important toxic plants of Texas, with emphasis on those of the Trans-Pecos region. For each toxic plant species, we shall characterize the toxic syndrome in the target species and identify the toxic principle to the extent possible. Clinical case studies will be utilized when available. In the final portion of the course, we shall examine a number of medicinal plants, largely selected from the literature as good examples for illustrating particular pharmacological or therapeutic principles. The ethnobotanical approach to the identification and development of pharmaceutically active compounds will be discussed, and in that context we'll discuss some herbal folk remedies of the Chihuahuan Desert region. Term papers, preferably with potential for publication, will be welcomed (and are recommended as a source of extra credit) but are not required.

Learning Objectives:

→ Recognize and describe important historical figures and their role in the development of toxicology, pharmacology and therapeutics based on bioactive plant constituents.
→ Apply fundamental principles of toxicology.
→ Identify local/regional toxic plant species by name (scientific and common) and family.
→ Compare the toxic syndromes produced by such plants, and relate these to the chemical nature of the toxicant, if known. Infer the mechanism of action of the toxicant, if possible. Where possible, relate these to disruption of fundamental life processes such as aerobic respiration, or compromised function of specific systems of the mammalian body (e.g., central nervous system, digestive system, urinary system, etc.).
→ Recognize notable medicinal plants used historically in Western medicine, and the appraise the methods used by the individuals who discovered their medicinal properties.

→ Analyze case studies and historical data characterizing the therapeutic effects of medicinal plants.
→ Evaluate, from historical accounts, the ethnobotanical approach to the discovery of pharmacologically active new chemical entitities, and (where possible) relate uses of medicinal plants by indigenous peoples to the scientific development of plant-derived compounds as safe and effective pharmaceutical agents.
→ In the context of ethnobotany, identify major plants used by curanderos of the Chihuahuan Desert region.
→ Determine appropriate criteria/methods for evaluating the safety and efficacy of folk medicines derived from such plants for specific therapeutic uses.
→ Compare and contrast the regulatory systems prescribed by law for FDA-regulated drugs on the one hand, and dietary supplements on the other hand. Judge these systems in terms of drug availability vs. probability of the occurrence of adverse events with the two types of substances.

Examinations and Grades:

Examinations:		Points
Exam 1	T, 16 Feb 2016	100
Exam 2	T, 10 Mar 2016	100
Exam 3	T, 28 Apr 2016	100
Final Exam:	R, 12 May 2016, 8:00 a.m.	200
	Total points =	500

If a student submits a term paper (due on the last day of class, 29 Apr 2014), it cannot lower the student's grade; it can only help the grade – by how much depends entirely on the quality of the paper. The choice of topics for the paper is as broad as the content of the course, which is to say it should focus on some aspect of a toxic or medicinal plant. Papers should ideally be interesting and original enough to be publishable in an appropriate scientific journal. Consult with the instructor as early as possible – and no later than 1 APR 2014 – if you are considering writing a term paper.

Attendance is required. Students will be dropped with an F for excessive absences, defined as absences that exceed 20% of the course (i.e., 6 lectures in this course). Grades historically show an unpleasant correlation to the number of absences from class. As a matter of courtesy to your classmates, please be on time, as class will start promptly at 8:00.

DISABILITIES INFORMATION: It is Sul Ross State University policy to provide reasonable accommodation to students with disabilities. Qualified students with disabilities needing academic or other accommodations to ensure full participation in the programs, services and activities at Sul Ross State University should contact the Counseling and Accessibility Center, Ferguson Hall 112, Box 122, Alpine, TX 79832 (phone 432-837-8203).

TENTATIVE LECTURE SCHEDULE AND TOPICS

DATE	TOPIC
JAN 19	Introduction; history of medicine, botany and toxicology
JAN 21	Applicable principles of pharmacology and toxicology
JAN 26	Common toxic syndromes and their mechanisms
JAN 28	Toxic plants of Texas: *Acacia–Astragalus*
FEB 2	Toxic plants of Texas: *Baileya–Claviceps*
FEB 4	Toxic plants of Texas: *Colubrina–Diospyros*
FEB 9	Toxic plants of Texas: *Drymaria–Isocoma*
FEB 11	Toxic plants of Texas: *Iva–Melilotus*
FEB 16	**EXAM 1**
FEB 18	Toxic plants of Texas: *Nerium–Polygonum*
FEB 23	Toxic plants of Texas: *Prosopis–Salsola*
FEB 25	Toxic plants of Texas: *Salvia–Sesbania*
MAR 1	Toxic plants of Texas: *Solanum–Zigadenus*
MAR 3	Early plant-based medicines
MAR 8	Early plant-based medicines
MAR 10	**EXAM 2**
MAR 14–18	**SPRING BREAK, NO CLASSES**
MAR 22	Modern herbal medicines
MAR 24	Modern herbal medicines
MAR 29	FDA, food and drug regulation, and the role of toxicology
MAR 31	FDA, food and drug regulation, and the role of toxicology
APR 5	Prescription drugs vs. dietary supplements
APR 7	Prescription drugs vs. dietary supplements
APR 12	Psychoactive drugs from plants and their regulation: FDA vs. DEA
APR 14	Chinese and Ayurvedic medicine vs. Western medicine
APR 19	Chihuahuan Desert plants used regionally as herbal remedies
APR 21	*Curanderismo* and plants as "medicine" *sensu lato*
APR 26	Ethnobotany and the development of new plant-derived pharmaceuticals
APR 28	**EXAM 3**
MAY 3	Exams 3 returned; term papers due; review. Last day of class for this course.

MAY 12, Thursday: **FINAL EXAM** (comprehensive, required of all students): 8:00−10:00 a.m.