

## Questions Concerning Ethnobotany and Medicinal Plants

- 1) All of us have heard of “old-wives-tales.” Was there any truth to the old women of Shropshire England who used Foxglove plants to treat people with water retention problems (dropsy)? A British M.D. (William Withering) became aware of this herbal treatment because patients with dropsy who received no relief of their symptoms under the care of British M.D.s improved with Foxglove treatment. What causes dropsy? How does Foxglove relieve this condition? Why did “old women” know of this treatment whereas well-trained British M.D.s did not?
- 2) The term “belladonna” means beautiful lady. How does this term relate to the name (genus and species) of the plant *Atropa belladonna*? What is “atropine”? Why did Cleopatra of Egypt use belladonna? Why did the German Army use “atropine” during trench warfare in WWI? Why does your eye doctor use atropine?
- 3) The first pharmaceutical company was set up in the 1800s by von Bayer (a German), who extracted from willow bark (*Salix alba*), and later synthesized salicylic acid, a pain reliever. What is the common name that we give salicylic acid today? Is this medicine still important today? How does this first pharmaceutical product demonstrate the relationship of plants to medicine?
- 4) By the middle 1980s, most pharmaceutical companies had abandoned exploring folk uses of plants. Why was this the case? By the early 1990s this changed. Why?
- 5) The vegetation of Madagascar (Island off Eastern Africa) has had most of its natural vegetation decimated by human activity (population explosion and poverty). One small plant from Madagascar used by traditional healers is the rosy periwinkle (*Catharanthus roseus*). The plant is now known to contain at least two drugs, vincristine and vinblastine. Why are these two drugs important in medicine today? If these plants had been driven to extinction before their discovery would this have had a negative impact on Western medicine (medicine practiced in the U.S.?)
- 6) A leading disease among Americans is heart disease. Traditional healers in India (Ayurvedic medicine) used the Indian Snake Root (*Rauvolfia serpentina*) as a source of “reserpine.” How does this drug help to alleviate heart disease?
- 7) The “father of ethnobotany” in America is a Harvard Professor, Richard Evans Schultes. What is ethnobotany and why is he known as the father of this discipline?
- 8) A sacred tree in Europe (commonly grown in church yards) also grows in the landscape around Moore Haus (Pepperdine International Program’s house in Heidelberg Germany). It is known as the European Yew Tree. Like its cousin, the Pacific Yew Tree (*Taxus brevifolia*) from Oregon and Washington, its bark and foliage are toxic to animals. Why are they toxic to animals (ecological reason)? Why is it not surprising that this toxin may also have medicinal benefit? What is the toxic extract, known as “taxol”, used for in medicine? For many years, the great concern about this toxin was its great expense, why?
- 9) Why or why not is the ethnobotanical approach to drug discovery justified?
- 10) In the U.S. is the lengthy time required and great expense involved in plant drug discovery justified?
- 11) Which approach is best for the discovery of new plant medicines – random surveys or ethnobotany? Why?
- 12) “Jere’s Tree” on the Malibu campus (and most of the trees in Alumni Park) are called “coral trees” and are native to tropical rain forests. Such trees often produce compounds that deter insect and fungal attacks. Paul Cox found that indigenous healers in Samoa use a specific coral tree (*Erythrina variegata*) to treat inflammation. He found that coral tree extracts also kills HIV? Why is this significant? Also, should we consider the healer’s knowledge of coral trees her “intellectual property rights” that need protection? Why or why not?
- 13) Why is the ethnobotanical approach to drug discovery a “race against time?”

- 14) What is the “doctrine of signatures” and why is this doctrine not subscribed to today?
- 15) Mark Plotkin has compared the loss of knowledge of indigenous healers to the burning down of a library containing books that are irreplaceable and even worse. Do you agree or disagree? Why?
- 16) Much of the Malibu campus is landscaped in Oleander plants. Our campus is also fire-prone (recurrent wildfires). Should we be concerned about smoke inhalation from burning oleander plants? Why or why not?
- 17) What is the difference between an “alkaloid” and a “glycoside.”? What is the difference between a “cyanogenic glycoside” and a “cardioactive glycoside.”? Which is most common in the seeds of fruit, such as apple seeds?
- 18) You may have read about Ross versus Grassi in the discovery of the mode of transmission of malaria. The common treatment then, and still useful today, is chewing on the “fever bark tree” (*Cinchona* spp.). What chemical/medicine is found in the bark of this rain forest tree? Why was it called “quina-quina” by the Incas of Peru? Why was it called “Jesuits’ bark” by Europeans.
- 19) A common plant in the deserts of California is known as “mormon tea” (*Ephedra* spp.) and has been used for a variety of medicinal purposes. Most recently, extracts from this plant have been used by college students to stay alert (it has killed a good number by overdose, and is now tightly regulated). It is commonly used to treat asthma. What is the active agent?
- 20) What drugs and their use are found from the following plants: Yams, Eucalyptus, *Aloe vera*, and *Cannabis sativa*?